

Mental disorders and violence-related injuries: prevention opportunities in emergency centres

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List of abbreviations

ASI	Addiction Severity Index
ASSIST	Alcohol, Smoking and Substance Involvement Screening Tool
AOD	Alcohol or drugs
AUDIT	Alcohol Use Disorders Identification Test
AUDIT-C	Alcohol Use Disorders Identification Test - Consumption
BDI	Beck Depression Inventory
CAGE	Cut down, Annoyed, Guilt, Eye-opener
CES-D	Center for Epidemiological Studies Depression Scale
CIDI	Composite International Diagnostic Interview
DALY	Disability-adjusted life year
DAST	Drug Abuse Screening Test
DSM	Diagnostic and Statistical Manual of Mental Disorders
EC	Emergency centre
EPDS	Edinburgh Postnatal Depression Scale
GHQ	General Health Questionnaire
HIC	High-income country
IPV	Intimate partner violence
LMIC	Low- and middle-income country
MINI	Mini International Neuropsychiatric Interview
PHQ	Patient Health Questionnaire
PST	Problem-solving therapy
PTDS	Posttraumatic Diagnostic Scale
RCT	Randomised controlled trial
SAOM	Substance Abuse Outcomes Module
SASH	South African Stress and Health Study
SBIRT	Screening, brief intervention and referral to treatment

SCID	Structured Clinical Interview for DSM Disorders
SECV	Survey of Exposure to Community Violence
SF-12	Short Form-12 Health Survey
SRQ	Self Reporting Questionnaire
TWEAK	Tolerance, Worried, Eye-opener, Amnesia, (K)Cut down
WHO	World Health Organization
YLD	Years lived with disability

Abstract

Mental disorders and violence-related injuries: prevention opportunities in emergency centres

Marie-Claire van der Westhuizen

14/08/2014

Background: Mental disorders and violence-related injuries make significant contributions to the global disease burden, mostly affecting young people. In emergency centres, mental disorders and violence-related injuries are commonly seen and, according to international data, violently injured patients are at-risk for mental disorders. Despite the scale of this problem, little evidence exists, especially from low- and middle-income-countries, regarding predictors of mental disorder and violence-related injuries, and data concerning interventions have not been synthesised.

Objectives:

1. To determine the prevalence of mental disorders and the socio-demographic and psychosocial risk factors associated with patients presenting with injuries due to violence in South African emergency centres (ECs).
2. To determine the prevalence of recurrent injury and the socio-demographic and psychosocial risk factors associated with patients presenting with injuries due to violence in South African ECs.
3. To explore the psychometric properties of the SRQ-20 screening tool for use in South African ECs.
4. To explore the psychometric properties of the ASSIST screening tool for use in South African ECs.
5. To systematically evaluate the available global literature to determine the efficacy of psychosocial interventions delivered in ECs for preventing re-injury due to violence.

Methods: A public health framework was utilised: problem definition, risk factor identification, intervention development, and implementation, with a focus on the first three steps. A **cross-sectional study** in two ECs, addressing the first two steps of the framework, recruited 200 patients presenting with injuries, which were sustained due to unintentional or violence-related causes. An interviewer-administered survey was used to collect data regarding injury history, alcohol or drug (AOD) use (ASSIST), traumatic life events and potential mental disorder diagnoses (SRQ-20; MINI diagnostic interview). Descriptive statistics were conducted to define the problem as per step one of the framework (i.e. prevalence of mental disorders and recurrent injury). Predictors (risk factors) for mental disorders were identified using logistic regression, addressing step two of the framework. Further logistic regression tests were conducted to identify predictors of presentation for violence-related injuries (and not an unintentional injury) as well as predictors of recurrent violence-related injury. Screening tools for mental disorders (SRQ-20) and AOD use risk factors (ASSIST) were validated using Cronbach's alpha and receiver operating curve statistics. A **systematic review utilising Cochrane methodology** was conducted to evaluate the evidence for psychosocial interventions for preventing violent re-injury.

Results: The majority of the sample were male (67%), between the ages of 25-40 years of age and did not complete high school (67.5%). Patients presenting with violence-related injuries, such as blunt assault injuries or stab wounds, constituted 59% of the sample and those with unintentional injuries, such as falls or traffic-related injuries, 41% of the sample. High prevalence rates for mental disorders and violence-related injuries were found: 63% and 30%, respectively in the overall sample. These figures rose to 70% and 48% in the violence-related injury group. Predictors for mental disorders included previous violence-related injuries and witnessed community violence. Predictors of presentation for violence-related injury, and not unintentional injury, included male gender and witnessed community violence, while any previous violence-related injury (in participants who had presented with unintentional injury or violence-related injury) was predicted by AOD use disorder diagnoses, high frequencies of

lifetime traumatic experiences and the 25 to 40 year age group. The SRQ-20 and the ASSIST were found to be effective tools for this setting. The internal consistency of the SRQ-20 as measured by Cronbach's alpha was 0.84 and the area under the ROC curve was 0.87 for the total sample, which compared favourably to findings from international studies. Similarly, the Cronbach's alpha statistic for the alcohol, cannabis, methamphetamine and mandrax ranged from 0.81 to 0.95, in keeping with international data. Furthermore, the discriminative validity of the ASSIST was found to be good, particularly in distinguishing between the use and abuse categories, as has been found in other validation studies. The systematic review of EC interventions for the prevention of further violence-related injuries identified two studies and no recommendations could be made due to the small sample size of the one study and the poor quality of the other.

Conclusion: EC patients are at-risk for mental disorder and recurrent violence-related injury, and risk factors can be identified in this group. There is a need for screening and intervention for problem AOD use and common mental disorders in injured EC patients. Data is scarce regarding EC interventions, as well as the feasibility and efficacy of screening for mental disorders in these settings. More research is needed to address these problems and tackle the disease burden due to mental disorders and violence-related injuries.

Preface

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Papers

This thesis incorporates work from the following papers:

1. Prevalence and predictors of mental disorder in intentionally and unintentionally injured patients (in press, *Journal of Nervous and Mental Disease*)
2. Cochrane **protocol**: Psychosocial interventions in the emergency centre setting for preventing re-injury due to interpersonal violence (published December 2013); full review in progress

Chapter 1: Introduction

1.1 Context

Mental disorders make a considerable contribution to the global burden of disease, accounting for 7.4% of all healthy years of life lost and particularly affecting the 15-39 year old age group (Murray et al., 2012). Across the lifespan, mental disorders are among the most disabling (Vos et al., 2012) and prevalent conditions with national lifetime prevalence rates of mental disorders ranging from 12 to 47.4% (Kessler et al., 2007). The lifetime prevalence rate for any disorder in the South African population is 30.3% (Herman et al., 2009), while unipolar depression and alcohol dependence are among of the top 15 causes of healthy years of life lost (Norman et al., 2006). Furthermore, these conditions have been making an increasing impact on global health over recent years. Since 1990, the burden of disease proportions have shifted slightly away from maternal and communicable diseases towards non-communicable disease, such as mental disorders and injuries (Murray, et al., 2012).

Globally, injuries account for 11.2% of the overall burden of disease, with injuries due to interpersonal violence contributing 1% of the global burden (Murray et al., 2012) and claiming over 1.6 million lives annually (Krug et al., 2002). In South Africa, injuries account for 2.3 million healthy years of life lost (Norman et al., 2007b) and injuries due to interpersonal violence are second only to HIV/AIDS as a contributor to the South African disease burden, followed by tuberculosis, and road traffic injuries (Norman et al., 2006). Data from a national mortality surveillance system showed that violence resulted in 32% of the non-natural deaths in the country during 2008 (Donson, 2009). Thus, injuries and mental disorders are both major contributors to the burden of disease, yet this is not the only feature they share. Evidence from previous research shows that mental disorders and injuries are associated in a number of ways.

First, the impact of injuries and mental disorders is most notable in adolescents and young to middle-aged adults globally, who are generally the economically active portion of society. Unipolar depressive disorders are the leading cause of disability-adjusted life years (DALYs) in women aged 15 to 44 years, while interpersonal violence makes the sixth largest contribution in the same age group for both genders (World Health Organization, 2008). Furthermore, mental disorders (unipolar depression, schizophrenia, bipolar disorder and alcohol abuse) and injuries (road traffic injuries and violent injuries) occupy the top six causes of DALYs in young people aged 10 to 24 years old (Gore et al., 2011).

Second, these two 'conditions' have been shown to share risk factors or associations, such as income levels and alcohol use (Lopez et al., 2006; Lund et al., 2010; Rehm et al., 2009). Third, injuries have been implicated as a precipitating factor in various mental disorders such as PTSD and depression (Bryant et al., 2010; Holbrook et al., 1999). Fourth, mental disorders such as alcohol or drug (AOD) abuse and schizophrenia have been shown to place sufferers at risk of injury (McGinty et al., 2012; Poole et al., 1997). Thus, the prevention and timely, appropriate treatment of mental disorders and injury has the potential to significantly impact the global burden of disease.

Emergency centre (EC) settings are ideal for identifying individuals at risk for mental disorder and recurrent injury. Studies in high-income countries (HICs) have shown that violent injury is a recurrent phenomenon (Sims et al., 1989) and that many EC populations display high prevalence rates of mental disorder (Dicker et al., 2011; O'Donnell et al., 2009). Brief screening tools for mental health and AOD use have been developed and successfully utilised in primary care and in emergency contexts (Patel et al., 2008). Furthermore, EC interventions for AOD use have been applied with varying success in HICs (Academic ED SBIRT Research Collaborative, 2007; D'Onofrio et al., 2012) and recently, in Cape Town (Sorsdahl et al., unpublished

data). Data from low- and middle-income countries (LMICs) regarding injury, mental disorder and effective interventions in EC patients is scarce.

1.2 Theoretical framework

A public health approach is suited to an investigation of prevention opportunities and the relationship between injury and mental disorders, and thus forms the foundation for this work. From a public health viewpoint, conditions are regarded as preventable problems which can potentially be solved by a joint effort from a number of disciplines, with leadership from the health sector.

Four public health steps have been used successfully to tackle a number of health threats and are applicable to violence and injury prevention (Mercy et al., 1993). (See Figure 1.1.)

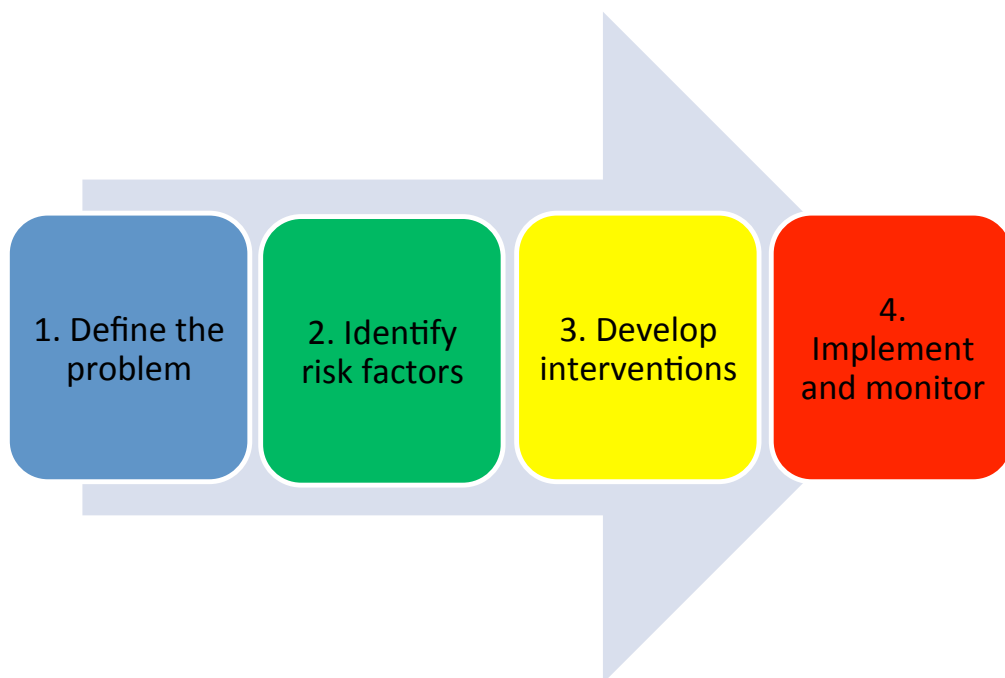


Figure 1.1 The four steps of the public health framework

These include:

1. Defining the problem (data collection and surveillance)

2. Identifying causes and risk factors
3. Developing and testing interventions
4. Implementing and monitoring of interventions.

The various components of this thesis will attempt to address the steps of this public health framework as follows:

1. Defining the problem: The mental disorder and recurrent violence-related prevalence data collected in the cross-sectional EC study will provide data regarding the scope of the mental disorder and violence-related injury problem in the South African EC setting. (See objectives 1 and 2 in section 1.8.2.) In order to define the problem effectively in future larger studies, two self-report screening tools were validated in the EC setting. (See objectives 3 and 4 in section 1.8.2.)
2. Identifying causes and risk factors: Predictors of mental disorder diagnoses, as well as predictors of presentation for violence-related injury and predictors of any history of violence-related injury are explored using data from the cross-sectional study. (See objectives 1 and 2 in section 1.8.2.)
3. Steps three and four of the framework are not specifically covered in this thesis; however, the systematic review of EC interventions for preventing re-injury due to violence provides some background information which will be necessary for developing such an EC intervention for the South African context. (See objective 5 in section 1.8.2.)

Public health aims to make a population-wide impact on a health problem such as mental health or violence. The ecological model has been utilised effectively by the World Health Organization (WHO) to categorise risk and protective factors, and plan interventions for specific health issues. (See Figure 1.2.) The focus of this work is the reporting and interpretation of data regarding the prevalence of mental disorders in

injured patients and other risk factors for such injury, predominantly found at the individual level. A proportion of the data has bearing on factors at the family and community levels. Furthermore, evidence will be presented regarding the efficacy of psychosocial interventions in ECs for preventing violent re-injury. These interventions mainly target individual level factors, yet the effect of these interventions has implications for the other levels of the model.

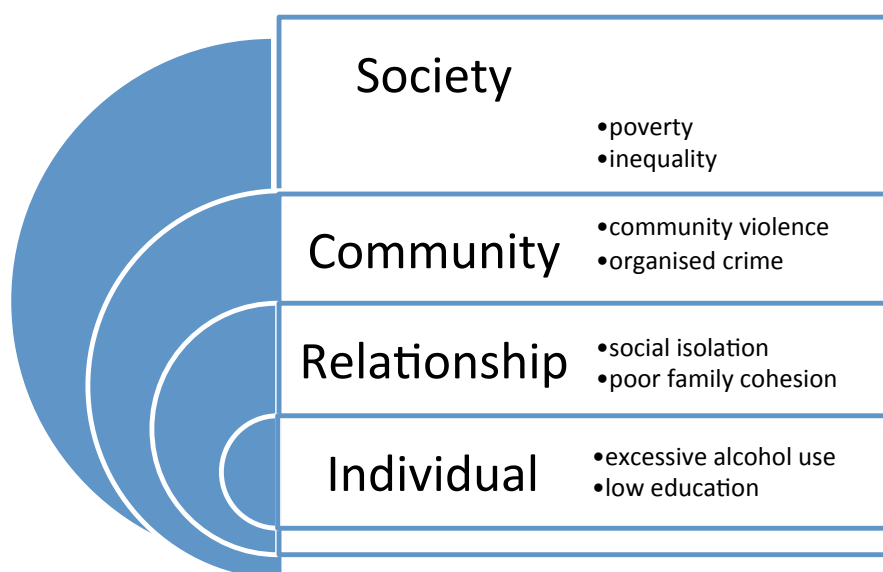


Figure 1.2 Ecological model displaying examples of cross-cutting risk factors for violence and poor mental health

Applying the public health approach to mental health and injury highlights significant gaps in the literature, particularly from LMICs. Data regarding prevalence rates, risk factors and appropriate interventions are scarce from these regions.

1.3 Mental disorders in injured emergency populations

A number of studies have investigated the mental health factors associated with injured patients presenting to ECs. The majority of these studies have focused on AOD abuse, and few have investigated other mental disorders (Cherpitel et al., 2003; Plüddemann et al., 2004). Those studies investigating other mental disorders have mainly been conducted in HICs and show that injured patients presenting to ECs

represent an at-risk group for mental disorders. Patients presenting with an injury are more likely to meet criteria for a pre-existing mental disorder than their non-injured counterparts (Dicker et al., 2011; O'Donnell et al., 2009; Poole et al., 1997; Wan et al., 2006). At the present time, very little research on this issue has been conducted in LMICs such as South Africa.

1.4 Violence-related injuries and repeat injury in emergency populations

In some settings, patients presenting with violence-related injuries is a common occurrence (Mureithi et al., 2013; Ward et al., 2010). Furthermore, studies from HICs have shown that up to 44% of patients presenting for a violence-related injury will return with a further violence-related injury within five years (Sims et al., 1989). A single South African EC study reporting violence-related injury recurrence rates was found (Stein and van der Spuy, 1997) and the investigators reported that over 50% of their violently injured sample had experienced a previous violence-related injury in their lifetime. Very little data regarding non-fatal violence-related injuries and repeat violence-related injuries is available from LMIC and South African ECs.

1.5 Risk factors for mental disorders and injury

Various risk factors have been associated with presentation for violence-related injuries and mental disorders. For example, AOD use disorders place an individual at risk for other mental disorders and repeat injury. Among injured EC patients mental health needs have been identified during research studies (Cunningham et al., 2009a; O'Donnell et al., 2009; Zatzick et al., 2004), but these needs are rarely elicited and even more infrequently addressed (Anixt et al., 2012; Zun and Rosen, 2003).

The most common risk factor identified in ECs is harmful AOD use (Cherpitel, 2007), and few studies have elicited other contributors to a patient's risk for injury and/or mental disorder. Other factors identified in community studies include witnessed violence (Goldmann et al., 2011; Herrenkohl et al., 2000) and past psychological

trauma (Green et al., 2010). EC data on these risk factors is scarce and at the present time, no LMIC studies have investigated other mental health risk factors in ECs. Eliciting these histories is important in order to identify patients at high risk for developing further mental health sequelae and in order to design appropriate EC interventions.

1.6 Screening tools for mental disorder

A number of mental health screening tools have been developed for clinical and research use. Some tools, such as the Center for Epidemiological Studies Depression Scale (CES-D), focus on specific disorders like depression (Radloff, 1977). Another category of screeners focuses on general psychological distress, for example the K10 scale (Kessler et al., 2002), and the 20-item Self Reporting Questionnaire (SRQ-20) (Harding et al., 1980). In certain instances, tools screening for nonspecific psychological distress are preferable to disorder-specific tools as the nonspecific tools will also provide an indicator of the severity of the distress regardless of the actual diagnosis (Kessler et al., 2002). This attribute is beneficial in the primary care setting, especially in low-resource settings where it may be necessary to allocate the limited resources to the most severely distressed individuals (Patel et al., 2008).

Of the many screening tools available, the SRQ-20 is one of the few specifically designed for the LMIC primary care setting. A number of studies from the developing world have investigated the psychometric properties of the SRQ-20 (Iacoponi and Jair de Jesus, 1989; Chen et al., 2009). In South Africa, the SRQ-20 has been evaluated predominantly in community settings (Rumble et al., 1996; Cherian et al., 1998) and one small study was conducted in an urban primary care clinic (Thom et al., 1993). At the present time, there is a lack of studies investigating the psychometric properties of screening tools in ECS and none have been validated in an LMIC EC setting. A further category of commonly used screening tools comprises those used for problem AOD use.

A number of measures have been developed to screen for problematic AOD use for healthcare settings and they vary in length, from very brief screeners such as the four-item CAGE (Cutting down, Annoyance by criticism, Guilty feeling, and Eye-openers) to the Addiction Severity Index (ASI) (Ewing, 1984) which comprises 155 questions (McLellan et al., 1980). These tools either interrogate a certain substance only, such as the Alcohol Use Identification Test (AUDIT) for alcohol (Saunders et al., 1993) or groups of substances, such as the ten-item Drug Abuse Screening Test (DAST-10) for illicit drugs (Skinner, 1982). Certain tools have been designed to classify patients using AOD into different risk categories, ranging from low- to high-risk users (Saunders et al., 1993). While these tools are longer than the very brief screening tools, they have been used successfully in healthcare settings (Reinert and Allen, 2007) and enable healthcare providers to tailor any intervention given according to the risk category of the patient.

The Alcohol, Smoking and Substance Involvement Screening Tool (ASSIST) uses eight questions to interrogate the use of ten different substances and categorises patients into three risk categories: low, moderate and high risk. Information pertaining to frequency and quantity of use, as well as consequences of use is elicited (WHO ASSIST Working Group, 2002). The substances screened for include alcohol, cannabis, cocaine and amphetamines among others. Thus, this measure enables the healthcare provider to identify patients in need of services and additionally, the level of services required can also be ascertained. The ASSIST has been validated in healthcare settings in a number of countries, including the USA, Spain, India and Zimbabwe (Humeniuk et al., 2008a; Rubio Valladolid et al., 2014). In South Africa, the psychometric properties of the tool have not been explored; yet the ASSIST has been used successfully in South African primary care and emergency settings (Sorsdahl et al., 2014b; Ward et al., 2008).

In view of the high burden of alcohol-attributable disease (Rehm et al., 2006), including injury, and the wide mental health treatment gap in LMICs (Kohn et al., 2004), it is important that mental disorders and psychological distress are detected and treated. Moreover, as mentioned above, EC populations have high rates of mental disorders, including AOD use, necessitating action in this context. Unless reliable screening tools are available for LMIC ECs, screening and brief intervention for AOD use and other mental health problems cannot be implemented in ECs.

1.7 Psychosocial interventions in EC settings

A number of brief interventions for mental disorders, including problematic AOD use, or psychological distress have been developed and tested in primary care (Bertholet et al., 2005; Patel et al., 2010). Some interventions, mainly for AOD use, have been applied in the emergency setting (Newton et al., 2013; Sorsdahl et al., unpublished data). Additionally, a few studies from HICs have applied these approaches to injury prevention in ECs targeting a variety of injury mechanisms, from road traffic injury to intimate partner violence (IPV) and youth violence (Cunningham et al., 2012; Houry et al., 2011; Johnston et al., 2002). Mental health professionals and lay counsellors have vital roles to play in such interventions which aim to alleviate mental health symptoms and bring about behaviour change.

In healthcare settings, studies have investigated screening, brief intervention and referral to treatment (SBIRT) for problematic AOD use in primary care, emergency settings and wards (Field et al., 2010). When it comes to violence and injury prevention interventions, most of the interventions are hospital ward-based, targeting patients admitted with serious injuries due to violence (Shibru et al., 2007; Snider and Lee, 2009). The literature shows that these patients constitute a smaller proportion of violence victims than those seen only in an EC and discharged (Alexandrescu et al., 2009; Wadman et al., 2003). Despite, these statistics, only a few interventions have targeted EC patients (Cunningham et al., 2012; Corbin et al.,

2011). The EC visit could represent a teachable moment for those victims of violence who engage in risky behaviours (Johnson et al., 2007). (It is important to note that many victims will not have been engaging in any risky behaviour.) The visit could also be an opportunity to address other risk factors for repeat violent victimization or perpetration, such as mental health factors.

At the present time, it is not clear whether psychosocial interventions delivered in emergency department settings can reduce re-injury due to violence. Furthermore, of the interventions showing promise, it would be beneficial to determine the specific components or types of interventions that are most effective, and in which group of patients these interventions are the most advantageous. Policymakers, health departments and clinicians could apply the results of this review in implementing interventions in emergency departments which are most likely to be beneficial for individual patients, communities and national health systems.

In summary, there is a lack of studies that investigate (1) the prevalence of mental disorders and the socio-demographic and psychosocial risk factors associated with patients presenting with injuries due to violence in South African ECs (2) the prevalence of recurrent injury and the socio-demographic and psychosocial risk factors associated with patients presenting with injuries due to violence in South African ECs, (3) the psychometric properties of appropriate screening tools for mental disorders in EC patients, (4) the psychometric properties of AOD use screening tools and (5) the evidence for the efficacy of psychosocial interventions in these settings. This thesis attempts to address these gaps by presenting data from an empirical study in addition to a systematic review of evidence for psychosocial interventions.

1.8 Research aim and objectives

1.8.1 Aim

To explore mental disorders, and risk factors for injury and violence-related injuries in emergency centre settings to identify injury prevention opportunities for LMICs.

1.8.2 Objectives

1. To determine the prevalence of mental disorders and the socio-demographic and psychosocial risk factors associated with patients presenting with injuries due to violence in South African emergency centres.
2. To determine the prevalence of recurrent injury and the socio-demographic and psychosocial risk factors associated with patients presenting with injuries due to violence in South African emergency centres.
3. To explore the psychometric properties of the SRQ-20 screening tool for use in South African emergency centres.
4. To explore the psychometric properties of the ASSIST screening tool for use in South African emergency centres.
5. To systematically evaluate the available global literature to determine the efficacy of psychosocial interventions delivered in emergency centres for preventing re-injury due to violence.

1.9 Outline of thesis

The thesis is structured as follows.

Chapter 2 reviews the relevant literature regarding each of the four research objectives.

Chapters 3, 4, 5, 6 and 7 will fulfil the objectives proposed in this thesis. Chapter 3 will address objective 1, Chapter 4 fulfils objective 2; Chapter 6 satisfies objectives 4 and Chapter 5 addresses objective 5. Each chapter justifies the research methods and thoroughly describes how that aspect of the study was conducted. Chapters 3, 4, 5 and 6 contain the results of empirical data gathered by the author, while

chapter 7 presents the results of a systematic review conducted according to the Cochrane Collaboration methodology. The main findings are discussed, in addition to limitations and potential areas for future research.

Chapter 8 draws on the accumulated evidence presented in Chapters 2, 3, 4, 5, 6 and 7 to address the objectives of this thesis. It also presents implications for policy and practice.

Chapter 2: Literature review

2.1 Introduction

The previous chapter introduced the study, briefly described the theoretical framework and outlined the contents of subsequent chapters. This chapter will present a background literature review for this thesis. Its purpose will be to outline mental disorders and injury in LMIC primary healthcare settings with regard to prevalence, risk factors and, briefly, interventions. (See Chapter 6 for a more detailed outline of psychosocial interventions in ECs.) Due to the relatively scarce data in the literature from LMICs, data from HICs will also be presented and, where available, studies from South Africa will be discussed. The search strategy used included (1) electronic database searches and (2) checking reference lists from retrieved papers.

2.2 Chapter outline

This chapter aims to provide background information for the overall approach to this thesis, namely exploring mental disorders and injury simultaneously in a specific healthcare setting. Refer to Figure 2.1 for a graphical representation of this literature review chapter. Mental disorders will be explored first in section 2.3, with regards to **global prevalence and burden of disease**, followed by the **prevalence of mental disorders in healthcare settings**. Due to the limited number of studies exploring the prevalence of mental disorders in emergency settings, this will first be investigated in the primary care literature. Thereafter, the data regarding prevalence of mental disorders in general emergency populations, all injured populations, and finally, violently injured populations will be provided. The **potential risk factors (or associations)** for mental disorders among patients presenting to primary healthcare and emergency settings will also be discussed.

For the purpose of this thesis, the term EC settings or ECs will be used to refer to emergency department or trauma centre settings. The reason for this is that there

are very few dedicated trauma centres in South Africa and most emergency facilities attend to medical and surgical patients at all levels of care. Therefore, for the South African setting, distinguishing between emergency department and trauma centre settings is not necessary.

The next section (section 2.4) will describe the intersection between mental disorders and injury, and the reasons for investigating both of these public health problems concurrently. Section 2.5 will present evidence regarding **the global burden of disease and the prevalence** of interpersonal violence-related injury, both internationally and in EC contexts. Risk factors **associated with violence-related injury presentation will also be described.**

Background on **screening tools to assess for symptoms of mental disorders and problematic AOD use** will be provided in section 2.6. Lastly, a brief overview of **Cochrane Collaboration systematic review methodology** will be provided as this approach is used in Chapter 7 to evaluate the evidence for effective EC-based interventions for preventing re-injury due to interpersonal violence.



Figure 2.1 Graphical outline of Chapter 2

2.3 Mental disorders

In the following sections, the burden of disease and the prevalence of mental disorders in primary healthcare settings and ECs will be discussed. Thereafter, research investigating any predictors of mental disorders in these settings will be presented. This section will provide the background for objective one.



2.3.1 Prevalence of mental disorders and the associated global burden of disease

Data from the World Mental Health Surveys conducted in over twenty countries around the world indicates that mental disorders are highly prevalent. The lifetime prevalence of mental disorders across 17 of the countries which participated in the surveys ranges from 12 to 47.4% (Kessler et al., 2007). Prevalence of people suffering from at least one mental disorder was high in certain HICs such as the United States and France, with 47.4% and 37.9% prevalence rates respectively. Other HICs, such as Italy and Spain displayed prevalence rates between 18 and 20%. LMICs such as Colombia (39.1%), Ukraine (36.1%) and South Africa (30.3%) recorded high prevalence rates. The high prevalence rates of mental disorders and the consequences of these disorders for individuals and communities make a considerable impact on global health.

Results from the 2010 Global Burden of Disease Study show that 22.7% of all years lived with disability (YLD) are attributable to mental and behavioural disorders (Vos et al., 2012). Within this group, the largest contributors to YLDs include unipolar depressive disorders, anxiety disorders, drug use disorders, schizophrenia, alcohol use disorders and bipolar disorder. Major depression is second only to lower back

pain in the YLD list across many regions, with AOD use disorders making the 12th and 15th largest contributions respectively to global YLDs. (See Table 2.1.)

Table 2.1 Top causes of YLDs – global and selected regions

	Global	Western Europe	High-income North America	Southern Sub-Saharan Africa
1.	Low back pain	Low back pain	Low back pain	HIV/AIDS
2.	Major depression	Major depression	Major depression	Major depression
3.	Iron-deficiency anaemia	Falls	Other musculoskeletal	Iron-deficiency anaemia
4.	Neck pain	Neck pain	Neck pain	Low back pain
5.	COPD	Other musculoskeletal	Anxiety disorders	COPD
6.	Other musculoskeletal	Anxiety disorders	COPD	Neck pain
7.	Anxiety disorders	Diabetes mellitus	Drug use disorders	Anxiety disorders
8.	Migraine	Migraine	Diabetes mellitus	Other musculoskeletal
9.	Diabetes mellitus	COPD	Schizophrenia	Asthma
10.	Falls	Alzheimer's/dementias	Osteoarthritis	Migraine
11.	Osteoarthritis	Drug use disorders	Asthma	Alcohol use disorders
12.	Drug use disorders	Asthma	Falls	Drug use disorders
13.	Other hearing loss	Osteoarthritis	BPH	Tuberculosis
14.	Asthma	Road injury	Alzheimer's/dementias	Other hearing loss
15.	Alcohol use disorders	Ischaemic heart disease	Migraine	Epilepsy
16.	Schizophrenia	BPH	Alcohol use disorders	Schizophrenia
17.	Road injury	Alcohol use disorders	Ischaemic heart disease	Osteoarthritis
18.	Bipolar affective disorder	Other hearing loss	Cerebrovascular disease	Diabetes mellitus
19.	Dysthymia	Bipolar affective disorder	Bipolar affective disorder	Bipolar affective disorder
20.	Epilepsy	Dysthymia	Other hearing loss	Falls

*COPD = chronic obstructive pulmonary disease

**BPH = benign prostatic hyperplasia

[Data from Global Burden of Disease Study 2010 (Vos et al., 2012)]

The DALY statistic is a combination of the years of life lost (YLLs) and the YLDs for a certain disorder. This combination is used as a measure of the overall burden of a condition taking into account the healthy years of life lost as a result of the condition. Mental and behavioural disorders as a group accounted for an increased percentage of global from 5.4% to 7.4% when comparing the studies conducted in 1990 and 2010. The DALYs for mental and behavioural disorders rose to over 15 million and the top contributors were major depression, anxiety disorders, AOD use disorders and schizophrenia. (See Table 2.2.) Alcohol use disorders feature in the top twenty contributors to DALYs in regions such as North America, Latin America and Eastern Europe, yet not in Sub-Saharan Africa. Despite this, the South African burden of disease figures show that that alcohol dependence alone, without alcohol abuse included, is the 16th highest cause of DALYs in the country.

Table 2.2 Top causes of disability-adjusted life years – global and selected regions

	Global	Western Europe	High-income North America	Southern Sub-Saharan Africa
1.	Ischaemic heart disease	Low back pain	Ischaemic heart disease	HIV/AIDS
2.	Lower respiratory infections	Ischaemic heart disease	COPD	Lower respiratory infections
3.	Cerebrovascular disease	Cerebrovascular disease	Low back pain	Diarrhoeal diseases
4.	Diarrhoeal diseases	Major depression	Trachea, bronchus, lung cancer	Tuberculosis
5.	HIV/AIDS	Trachea, bronchus, lung cancer	Major depression	Interpersonal violence
6.	Low back pain	Falls	Other musculoskeletal disorders	Preterm birth complications
7.	Malaria	COPD	Cerebrovascular disease	Cerebrovascular disease
8.	Preterm birth complications	Neck pain	Diabetes mellitus	Diabetes mellitus
9.	COPD	Other musculoskeletal disorders	Neck pain	COPD
10.	Road injury	Diabetes mellitus	Road injury	Major depression
11.	Major depression	Alzheimer's/ dementias	Drug use disorders	Iron-deficiency anaemia
12.	Neonatal encephalopathy	Road injury	Alzheimer's/ dementias	Neonatal encephalopathy
13.	Tuberculosis	Colon and rectum cancers	Anxiety disorders	Road injury
14.	Diabetes mellitus	Anxiety disorders	Self-harm	Ischaemic heart disease
15.	Iron-deficiency anaemia	Self-harm	Falls	Low back pain
16.	Sepsis and other infectious diseases (newborns)	Breast cancer	Liver cirrhosis	Epilepsy
17.	Congenital anomalies	Other cardiovascular and circulatory disorders	Colon and rectum cancers	Congenital anomalies
18.	Self-harm	Migraine	Chronic kidney diseases	Drug use disorders
19.	Falls	Liver cirrhosis	Alcohol use disorders	Exposure to mechanical forces
20.	Protein-energy malnutrition	Drug use disorders	Breast cancer	Malaria

[Data from Global Burden of Disease Study 2010 (Murray et al., 2012)]

In young people aged 10 to 24 years old, mental disorders (unipolar depression, schizophrenia and bipolar disorder) occupy three of the top ten causes of DALYs (Gore et al., 2011). Additionally, mental disorders continue to play a prominent role in the poor health of young to middle-aged adults. Females are particularly vulnerable to mental disorders and the proportion of DALYs contributed starts to decrease after the age of 49 in females and around 44 years of age in males (Murray et al., 2012). Despite the fact that mental and behavioural disorders are responsible for a high proportion of DALYs in younger people, the most significant impact of these disorders is seen in the YLD statistic. In the age group 20-29 years, mental and behavioural disorders alone contribute 36% of YLDs (Vos et al., 2012), implying an enormous cost to society in people during the economically active phase of their lives.

Economic losses due to mental disorders are not only due to the cost of therapeutic interventions, but also to due to productivity losses in the person suffering from mental disorder and their caregivers, potentially affecting families, the communities and society as a whole (Knapp, 2012). Data from the United Kingdom shows that interventions such as screening and brief interventions for harmful or hazardous alcohol use in primary care are cost-effective. For every £1 spent on the alcohol intervention the saving was almost £12 after a seven-year period (Aslam et al., 2011). Similarly, a collaborative care intervention for depression amongst newly diagnosed type II diabetes patients saved £1026 for every £1 spent on the intervention (King et al., 2011). South African data suggests similar cost-saving implications (Jack et al., 2014).

The South African Stress and Health Study (SASH) provided the first data regarding mental disorders in South Africa in a nationally representative sample (Herman et al., 2009). This study found that the prevalence of mental disorders is high in the

general population with a lifetime prevalence of 30.3% and a 12-month prevalence rate of 16.5%. The most common lifetime disorders in the population were alcohol abuse (11.4%), major depressive disorder (9.8%) and agoraphobia without panic (9.8%). The Western Cape was found to have the highest rates of lifetime disorders (39.4%) and AOD use disorders (20.6%). Thus, high rates of mental disorders can be found in the South African population, suggesting that the burden on primary care facilities could be substantial.

Mental disorders are responsible for a significant number of healthcare visits, either directly as a result of the disorder, or indirectly due to somatic symptoms (Barsky et al., 2001; Fleury et al., 2012; Watson et al., 2005). A number of studies demonstrate that most people with mental disorder symptoms access care at the primary care level and do not consult, or have access to, a mental health professional (Olfson et al., 2014; Watson et al., 2005; Williams et al., 2008). As a result, the burden on primary healthcare, including ECs, is high. This is evident in the high prevalence of mental disorders reported amongst those presenting to primary healthcare facilities (including ECs) compared to the prevalence of mental disorders amongst the general population.



2.3.2. Prevalence and associations of mental disorder in primary health care

Given the scarcity of studies investigating the prevalence of mental disorders in ECs, initially data from primary healthcare facilities will be presented. Furthermore, many primary care patients access healthcare through ECs: studies from LMICs and HICs show that many EC visits are non-urgent and would be more suited to a primary care consultation (Carret et al., 2009; Hodkinson and Wallis, 2009). The proportion

of so-called 'inappropriate' visits has been reported to be as high as 89% in some settings (Lowy et al., 1994). Thus data from primary care provides valuable insights into the prevalence of mental disorder in EC contexts. First, an overview of primary care studies will be presented. Second, data from primary care settings in HICs will be described; third, LMIC data will be discussed with a particular focus on Sub-Saharan Africa, and fourth, studies from South Africa will be reported. Fifth, an overview of factors associated with a diagnosis of a mental disorder or mental disorder symptoms will be presented.

2.3.2.1 Prevalence of mental disorders in primary care: setting the scene

Studies in primary care have either focused on individual disorders, for example post-traumatic stress disorder (PTSD) (Wrenn et al., 2011), groups of disorders, such as common mental disorders (Faisal-Cury et al., 2009), or the presence of any disorder in the sample (Thom et al., 1993). Some studies have focused on the primary care population in general, ie. patients presenting with any complaint (Kroenke et al., 2007), while most have recruited a sample from a specific group of patients. For example, some investigators have recruited patients presenting for treatment for a specific disease such as tuberculosis or HIV (Peltzer et al., 2013), while others have targeted a gender (Hauenstein and Peddada, 2007), ethnic group (Shim et al., 2013) or age category (Olivera et al., 2008). Furthermore, a wide range of methodologies have been employed in this setting, limiting the comparability of the data. Some studies employed a two phase approach, such as Patel et al (2010) in India, whereby participants were first screened with a mental health screening tool and only those screening positive underwent a further clinical interview. Other studies employed a structured, validated clinical interview for the whole study sample, for example Serrano-Blanco et al (2009) in Spain. Yet another group of studies have utilised only mental health screening tools in order to identify risk for a specific disorder, such as depression, (Hamdan et al., 2008), or to detect high levels of general psychological distress (Peltzer et al., 2012b). Data is scarce from South African healthcare services, particularly data on patients meeting criteria for mental

disorders, i.e. most investigators have not used diagnostic interviews (Breuer et al., 2012; Ramirez-Avila et al., 2012).

The data is presented and grouped according to the country income status as classified by the World Bank, i.e. HICs and LMICs. There are a number of reasons for approaching the literature in this manner. First, the global mental health literature tends to approach the literature in this way, often in order to highlight the mental disorder treatment gap and lack of resources for mental health as well as the scarcity of research output being generated in these countries (Patel, 2007). Second, LMICs globally have these problems in common, i.e. the lack of resources and the high mental health treatment gap, albeit to varying degrees. Third, many of the problems commonly associated with LMICs such as food insecurity, low socioeconomic status of many individuals, high rates of violence and poor living conditions have been strongly associated with mental health problems (Lund, et al., 2010). Fourth, South Africa is an LMIC as classified by the World Bank in the upper middle income category (The World Bank, 2014). Thus, South Africa does have some advantage over other LMICs in Africa regarding available resources, and as discussed in section 8.3.4.1 has made progress regarding mental health legislation and policy. Conversely, many of the 'LMIC' problems associated with poor mental health and mentioned above are prevalent in South Africa, namely food insecurity, low socioeconomic status of individuals and high rates of violence (Norman et al., 2007b; Rose et al., 2002; Statistics South Africa, 2014). Thus, the presentation of data from other LMIC countries is relevant to South Africa.

2.3.2.2 Prevalence of mental disorder in HIC primary care settings

Data on the prevalence of mental disorders in primary care is available from HICs across different regions, including Europe (Anseau et al., 2004) and North America (Gillespie et al., 2009). In these regions, a number of studies have employed a broader sampling approach, investigating the prevalence of all mental disorders or a

specific disorder in EC patients presenting with any complaint (Toft et al., 2005; Wrenn et al., 2011).

Examples of studies exploring any mental disorder in a broader HIC primary care population are discussed below. Investigators in Catalonia, Spain employed structured interviews, the Structured Clinical Interview for DSM Disorders 1 (SCID-1) for depressive and anxiety disorders and the Mini International Neuropsychiatric Interview (MINI) for other disorders, in interviewing 3 815 primary care patients over 1 year during 2005 and 2006 (Serrano-Blanco et al., 2010). They found that 45.1% of the sample met Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria for any lifetime mental disorder, and 30.2% for a disorder in the preceding 12 months. The most common 12-month disorders were major depression (9.6%), panic disorder (7.0%), specific phobia (6.6%) and generalised anxiety disorder (3.3%).

A Danish study utilised a two-phase approach over three weeks in 2000 to investigate mental disorder diagnoses in 1785 adult primary care patients (Toft et al., 2005). During the first phase the patients were screened using the 12-item Symptom Checklist-90 (SCL-90) somatisation subscale, the 7-item Whitely index for illness worry, the 8-item Symptom Checklist (SCL-8) and the 4-item CAGE screener. Those participants with high scores on these screening tools, and a small random sample of screen-negative participants, were then interviewed using the Schedules for Clinical Assessment in Neuropsychiatry (SCAN) interview. Of the entire sample, 65% were diagnosed with any lifetime disorder and 49.7% with a current mental disorder. The most prevalent lifetime disorders were somatisation disorder (11.8%), moderate/severe depression (9.2%) and alcohol abuse (5.4%).

Investigators from Belgium interviewed a random sample of 2316 adult primary care patients taken from 86 general practitioner practices during February and March

1999 (Anseau et al., 2004). The PRIME-MD questionnaire was administered, either at the practice or during a home visit. Any mental disorder was detected in 42.5% of the sample, with major depression (13.9%), dysthymia (12.6%), multisomatoform disorder (12.7%) and generalised anxiety disorder (10.3%) being among the most common diagnoses.

Examples of further HIC studies focusing on the prevalence of specific disorders in a general primary care population follow below. A study from the United States sampled an urban primary care population, investigating the prevalence of PTSD using the PTSD symptom scale (PSS) (Wrenn et al., 2011). The investigators reported high levels of previous traumatic experiences across the lifespan and found a PTSD prevalence of 30% in the 767 adult patients recruited for the study.

A Swedish study used the Beck Depression Inventory (BDI) to screen all adult patients presenting to a primary care clinic (Stromberg et al., 2011). Those scoring above threshold on the BDI were interviewed and depression cases were diagnosed using the DSM-IV criteria. Of the 404 patients recruited, 31% were diagnosed with depression. Since patients known to have other mental disorder diagnoses were excluded, the true prevalence in this population would be higher, as those with comorbid disorders would have been excluded.

A further study in Germany, combined the use of screening tools, utilising the WHO-5 and the 12 item General Health Questionnaire (GHQ-12), and a diagnostic interview (the Composite International Diagnostic Interview or CIDI) in order to investigate the prevalence of depressive, anxiety and somatoform disorders and their comorbidities in 394 primary care patients (Mergl et al., 2007). The investigators found that 18.1% of their sample had a diagnosis of major depression, 14% met criteria for agoraphobia and 3% for panic disorder, while there were no cases of somatoform disorder.

Specific populations in HIC primary care have been studied in order to determine the prevalence of mental disorders. A study recruiting 3462 patients in a rural US clinic population found that 11.6% of the population met criteria for panic disorder and 28.7% were diagnosed with generalised anxiety disorder using the Mini Neuropsychiatric Interview (Marks et al., 2010).

The veteran primary care population in the US has been widely studied especially regarding mood and anxiety disorders. Investigators have reported probable depression rates of 20% in a sample of 10 929 veterans utilising the two- and nine-item Patient Health Questionnaires (PHQ-2 and PHQ-9) screening tools (Yano et al., 2012). Other studies investigating generalised anxiety disorder, alcohol misuse and post-traumatic stress disorder in veteran populations have reported prevalence rates of 12%, 28% and 37.3% respectively (Milanak et al., 2013; Jakupcak et al., 2010).

Thus, in HICS, a number of studies have been conducted investigating a variety of disorders in primary care populations, often using relatively large sample sizes. Investigators have sampled general primary care populations and specific groups within primary care, such as rural patients (Marks et al., 2010), war veterans (Magruder et al., 2005) and various ethnic groups (Bushnell, 2005; Mellman et al., 2008). Fewer studies have been performed in LMICs than in HICs; there is a lack of data regarding general primary care populations in particular. Examples from the available data are discussed below.

2.3.2.3 Prevalence of mental disorder in LMIC primary care settings

Currently, there is a scarcity of studies investigating the prevalence of mental disorders in LMIC primary healthcare facilities. Of the studies available, the majority focus on certain patient groups such as those receiving tuberculosis or HIV care (Peltzer et al., 2013; Nachea et al., 2013). A number of the studies conducted in

LMICs, have recruited perinatal populations, mainly exploring mental health symptoms (Nakku et al., 2006; Stranix-Chibanda et al., 2005), with some studies focusing on the participants' experiences of IPV and the associated consequences (Mapayi et al., 2013; Ola et al., 2011). Some investigators have made use of brief screening tools for mental health symptoms (Martinez et al., 2008; Ramirez-Avila et al., 2012), including AOD use, while others have used a structured diagnostic interview in their sample (Patel et al., 2010; Nakku et al., 2006).

A few studies have sampled general primary care populations and some instances are presented below. Data from a randomised controlled trial in India using lay health counsellors in the treatment of depressive and anxiety disorders, found that 18.8% of the 20 352 primary care patients screened scored above the cutoff score on the GHQ-12 (Patel et al., 2010) . Eligible adult patients (n=3434) were then interviewed using the revised clinical interview schedule (CIS-R). Of the entire population screened, 5.1% were found to have a mixed anxiety-depressive disorder, 3.8% had depression and 2.1% a pure anxiety disorder.

An Israeli primary care sample of 2 948 patients yielded a current mental disorder prevalence rate of 46.3% after employing a two-phase approach, using the GHQ-12 and the CIDI (Laufer et al., 2013). The current depression rate was 19.4%; 0.4% of the sample met criteria for alcohol abuse and 15.5% for generalised anxiety disorder. Another Israeli study found that 31.1% of their 976 participants had any mental disorder and 20.6% met criteria for current depression and 11.2% for generalised anxiety disorder (Cwikel et al., 2008).

As mentioned above most of the studies from LMICs have recruited specific patient groups. One such study was performed in Zambia with a small sample of patients (n=120) on epilepsy treatment (Mbewe et al., 2013). This study validated a mental health screening tool in this group and reported that 49% of their participants

scored above the cutoff score on the screening tool, with the 73% screening positive for depression symptoms and 23% identified as having above-threshold anxiety symptoms.

A plethora of studies from Sub-Saharan Africa have investigated mental disorders or symptomatology in people living with HIV. For example, investigators using symptom screening tools reported that 11-24% of patients suffered from depressive symptoms (Hatcher et al., 2012; Martinez et al., 2008; van den Heuvel et al., 2013), while those employing diagnostic tools found that around 14-18% of their participants met criteria for major depression (Akena et al., 2013; Olagunju et al., 2013; Olisah et al., 2010). Further studies have explored harmful alcohol use in this population reporting that between 15 and 60% of their population screened positive for hazardous drinking on the AUDIT (Hahn et al., 2012; Martinez et al., 2008).

Another group commonly recruited for mental health research is the perinatal population. Data from a few studies performed in Tanzania, Ghana and investigating depression are presented here. Investigators have found depression prevalence rates in antenatal populations to be in the range of 9.9-39.5% (Kaaya et al., 2010; Weobong et al., 2014), while postnatal samples of women have yielded postnatal depression rates ranging from 6-33% (Chibanda et al., 2010; Nakku et al., 2006). Studies conducted in LMIC primary care have often focused on specific groups, and specific disorders, such as depression. The research emanating from South Africa follows a very similar pattern to the work reported from the rest of Sub-Saharan Africa.

2.3.2.4 Prevalence of mental disorder in South African primary care settings

The few studies undertaken in South Africa have been predominantly from very specific subgroups of people and not generalisable to primary healthcare as a whole. Patients seeking antenatal (Hartley et al., 2011), HIV (Ramirez-Avila et al., 2012) or

tuberculosis (Peltzer and Louw, 2013) care comprise the majority of the populations researched in South Africa.

For example, a large study with 4900 participants was conducted in South Africa amongst patients with tuberculosis attending primary healthcare clinics in the Northern Cape, Eastern Cape and KwaZulu Natal (Peltzer and Louw, 2013). These investigators also employed brief screening tools, including the Kessler Psychological Distress Scale (K10), a three-question screen for suicidal behaviour, the Primary Care PTSD Screen (PC-PTSD) and the AUDIT. The majority of the sample (81%) scored above 15 on the K10, screening positive for psychological distress and 9% of the sample reported suicidal ideation. A positive screen for PTSD was noted in 29% of the sample and 23% of the total sample scored above 8 on the AUDIT, thus falling into the harmful or hazardous alcohol consumption risk categories.

HIV primary care populations in South Africa have also been investigated regarding mental disorders and hazardous AOD use. For example, one study in two settings in KwaZulu Natal recruited 1 545 newly diagnosed HIV patients (Ramirez-Avila et al., 2012). The researchers used a mental health screening tool, the five item Mental Health Index (MHI-5) and found that 55% of their sample displayed depressive symptoms. A smaller study in an HIV clinic in Cape Town, also used a mental health screening tool, the Substance Abuse and Mental Illness Symptoms Screener (SAMISS) and they found that 43% of their participants had mental disorder symptoms, 19% had depressive symptoms, adjustment disorder symptoms were found in 17% of the sample and 20% reported symptoms in keeping with drug or alcohol abuse or dependence (Breuer et al., 2012).

A good proportion of the primary care mental health studies in South Africa have been conducted in perinatal populations. One such study from Cape Town, recruited 1062 participants used the Edinburgh Postnatal Depression Scale (EPDS) in an

antenatal population. Of their sample, 39% scored above threshold on the EPDS for depressive symptoms (Hartley et al., 2011). An intervention study also conducted in Cape Town, reported that 32% of their sample of antenatal care patients met the study's criteria for referral to an on-site counsellor (Honikman et al., 2012). These patients were identified using the EPDS and a mental distress risk factor screening tool.

A limited number of South African primary care studies have looked at the broader primary care population. A small study performed in a Cape Town primary care setting recruited 43 participants and found that 41.9% were positive for harmful or hazardous alcohol use on the AUDIT and 30.2% of the sample were positive for harmful drug use on the Drug Use Disorders Identification Test (DUDIT) (Kader et al., 2012). Another study in a primary health care setting in Cape Town recruited 2 618 adult patients, over-sampling the 18-24 year age group. Patients self-reporting depressive or anxiety symptoms, on the two items used from the PHQ, constituted 36.7% of the sample (Sorsdahl et al., 2010). Hazardous AOD use was measured using the ASSIST. Hazardous use of alcohol was present in 12.6% of the sample and drug use in 3.4% (Ward et al., 2008).

A further study also performed near Cape Town, recruited 201 primary care patients and found that 19.9% of the sample suffered from current PTSD and 37% from major depression (Carey et al., 2003). Somatisation (35%) and panic disorder (25%) were also highly prevalent in the sample. In this study, 94% of the sample had experienced at least one lifetime traumatic event and the mean number of traumatic events was 3.8. The MINI diagnostic interview and the PTSD module of the CIDI was utilised in this study. Thus the data from South Africa, as from other LMICs, is scarce and the studies are methodologically heterogeneous and often neglect the broader primary care population and the full range of mental disorders. Further investigation in the South African primary healthcare context is needed.

2.3.2.5 Summary of mental disorder prevalence in primary care settings

In summary, studies conducted in primary care utilised a variety of methodologies in order to address their heterogeneous aims. A number of categories can be used to characterise the studies:

4. The sample recruited either patients presenting with any complaint or those presenting to primary care for a specific reason, such as antenatal care or chronic disease treatment.
5. The aims of the studies included investigating the prevalence of any disorder, a group of disorders, such as common mental disorders, or a single disorder such as PTSD.
6. The studies used screening tools only or a diagnostic interview alone, or a combination of screening tools and a diagnostic interview.

Bearing in mind, the heterogeneity described above, the prevalence of mental disorder in primary care can be summarised as follows. The prevalence of any disorder ranges from 45.1% to 65 % (Toft et al., 2005; Serrano-Blanco et al., 2010) over the lifetime and current disorders 31.1% to 49.7% (Toft et al., 2005; Cwikel et al., 2008). The prevalence of disorders such as major depression and generalised anxiety disorder are found in 3.8% to 37% (Patel et al., 2010; Carey et al., 2003) and 3.3% to 28.7% (Serrano-Blanco et al., 2010; Marks et al., 2010) of primary care patients, respectively. There are large gaps in the LMIC literature, particularly from Sub-Saharan Africa.

2.3.2.6 Factors associated with mental disorder in primary care settings

Of the studies exploring mental disorders in primary care, a few have reported variables associated with a diagnosis or positive screen for mental disorder. The most commonly reported associations are with sociodemographic factors (Laufer et al., 2013), although a few studies have considered other factors such as negative life events (Muhwezi et al., 2008) and planned versus unplanned pregnancy (Nakku et al., 2006). The variables studied differed between settings. For example, obstetric

complications as a variable was included in a study conducted in an antenatal setting (Faisal-Cury et al., 2009), while functional impairment was studied as a predictor in elderly and chronic disease populations (Lossnitzer et al., 2013; Weyerer et al., 2013). The outcome most often predicted in these studies is depression and various groups of patients have been recruited for investigation. Relatively few studies have examined the predictors of mental disorders in primary care and particularly disorders other than depression. Mental disorders and psychological distress variables in the literature are more likely to be used as independent variables for various outcomes such as predicting disease outcome (Mayston et al., 2012; Pan et al., 2011) and adherence to treatment (Nachega et al., 2013; Olisah et al., 2010). An overview of the various factors is reported below.

A limited number of studies have looked at predictors of mental disorder symptoms in general primary care populations. A Turkish study recruited patients presenting with any complaint, but only selected female patients for their study. A diagnosis of any mental disorder was associated with IPV, previous traumatic experiences, anaemia and a skin disease (cutaneous leishmaniasis) (Simsek et al., 2008). An Israeli study found low levels of education, unemployment and not having children to be predictive of various mental disorders in their primary care sample (Laufer et al., 2013). In Uganda, stressful life events were found to predict major depression (Muhwezi et al., 2008), while depression in Swedish primary care patients was associated with stress, perceived poor physical health and dissatisfaction with the family situation (Stromberg et al., 2011). A Cape Town study interviewed primary care clinic attendees regarding hazardous AOD use utilising the ASSIST (Ward et al., 2008). Being young and male, having no religious involvement and having higher stress levels predicted hazardous alcohol use. Researchers in the United States investigated predictors of PTSD diagnosis in an urban primary care sample, finding that childhood abuse and non-child abuse trauma predicted a PTSD diagnosis while resilience, measured by the Connor-Davidson Resilience Scale, was protective

(Wrenn et al., 2011). As mentioned above, most investigators have targeted specific populations of patients when investigating predictors of mental disorder. Some examples of these studies are presented below.

A number of variables have been studied in antenatal populations, mainly in LMICs. Depression in Ugandan mothers was associated being young, single, having experienced negative life events and having an unplanned pregnancy among other factors (Nakku et al., 2006). Common mental disorder in Brazilian antenatal patients was predicted by age at current pregnancy and at first delivery as well as current obstetric complications and having no friends in the community (Faisal-Cury et al., 2009). Experiences of violence predicted depression in Nigerian and South African mothers (Hartley et al., 2011; Ola et al., 2011).

Other populations often studied with regards to associations with diagnosis of mental disorder are those groups with chronic or infectious diseases, such as heart failure or HIV. A South African study conducted in three provinces in the country explored predictors of hazardous alcohol use as measured by the AUDIT and psychological distress scores above threshold on the K10 screening tool (Peltzer et al., 2012a; Peltzer et al., 2012b). Predictors of hazardous drinking for the men in their sample included poor perceived health, tobacco use, psychological distress and retreatment for tuberculosis. Factors associated with hazardous drinking in females were lower education, tobacco use and retreatment for tuberculosis. Psychological distress, with K10 scores above or equal to 16, was predicted by older age, less formal education, poverty and being HIV-positive.

Studies from Nigeria, South Africa and Uganda in HIV-positive primary care samples found that lower levels of education, having no previous antiretroviral therapy, decreased functional activity and, for women, food insecurity played a role in predicting depressive symptoms on the various mental disorder screening tools used

(Farley et al., 2010; Ramirez-Avila et al., 2012; Tsai et al., 2012). A study from Germany in a sample of heart failure patients found that a previous depressive episode, previous resuscitation, current smoking and poor physical functioning were among the factors predicting a current depression diagnosis (Lossnitzer et al., 2013).

Thus, factors including stressful life events, experiences of violence, physical impairment, and relationship status feature prominently in the literature on predictors of mental disorder. Many of the above factors are also of importance in vulnerable EC populations, although data is scarce, especially from LMIC settings.



2.3.3. Prevalence and associations of mental disorder in EC settings

In this section, a brief overview of mental disorders and symptoms amongst EC patients presenting with any complaint will be presented. Next, the prevalence of problem AOD use and AOD use disorders in ECs will be explored briefly. Thereafter, the prevalence of other mental disorders, apart from AOD use disorders, in injured patients will be reported and lastly, predictors of mental disorder will be discussed.

Similar to research conducted in primary health care (see section 2.3.2), research in ECs investigating mental health factors has looked at a number of aspects of mental health. Some have explored the diagnosis of any disorder in EC patients (Downey et al., 2012), others have investigated a specific disorder or group of disorders (Booth et al., 2011). Further studies have focused on certain symptoms or behaviours, such as suicidality (Claassen and Larkin, 2005), risky AOD use (Sanjuan et al., 2014) or general psychological distress (Cunningham et al., 2009a), which could indicate the presence of a mental disorder.

In the literature, certain EC patient groups feature prominently in studies exploring mental disorder symptoms in emergency contexts. These groups include those patients labelled as frequent EC attenders (Byrne et al., 2003; Williams et al., 2001), specific EC populations presenting with medical complaints, such as those presenting with non-cardiac chest pain (Kuijpers et al., 2007), and patients presenting with self-harming behaviour or suicide attempts (Bi et al., 2010; Bilen et al., 2011; Kawashima et al., 2014). Other investigators have taken a broader approach and have recruited patients presenting with any complaint (Booth et al., 2011).

Although the data for HICs and LMICs are discussed separately, the socioeconomic status of the samples recruited for the studies may be similar as the EC studies in LMICs access state-run lower resourced facilities (Hanewinckel et al., 2010; Mureithi et al., 2013) and many HIC studies, particularly from the United States (Cunningham, 2009a; Hankin, 2013) access inner-city low-income populations. The major differences in these cases between the LMIC and the HIC data is the amount and richness of the data from the HICs and the greater number of resources available to screen and manage these patients. Thus, it is appropriate to present the data by country income level.

2.3.3.1. Prevalence of mental disorders in general EC populations

The most widely investigated mental health factors in general EC populations are the symptoms and diagnoses of AOD use disorders. Given the surge of interest in brief interventions to address AOD use among patients presenting for various healthcare services (Agerwala and McCance-Katz, 2012), the data on AOD use has increased dramatically, while a limited number of studies are available exploring the presence of other mental disorders in EC patients. Examples of studies conducted in general EC populations (i.e. patients presenting with a wide range of complaints) will be presented below, beginning with AOD use.

A number of studies have examined AOD use in EC patients in cross-sectional and intervention studies, predominantly in HICs. For example, two US studies analysed screening data from EC patients in the US. One of the studies used data from 14 866 patients in six ECs and reported that 45% of their sample screened positive for risky drinking on the AUDIT-Consumption (AUDIT-C) (Sanjuan et al., 2014). Another study in a single hospital EC recruiting 19 055 patients, identified 55.8% of the group as drinking at moderate or high levels of risk on the ASSIST (Hankin et al., 2013). Further US studies in ECs have reported risky drinking rates of 32% and 62%, respectively (Krupski et al., 2012; Murphy et al., 2013). Other HIC studies from England and Australia report 22%, 31% and 39% of EC patients engaging in harmful or hazardous drinking (Crawford et al., 2004; Kinner et al., 2005; Tjipto et al., 2006). Data regarding illicit drug use in general EC populations are scarce. Studies from Australia, the Netherlands and the US found that 8%, 9% and 30-49% of their EC samples used illicit drugs (Kinner et al., 2005; Krupski et al., 2012; Sanjuan et al., 2014). Few studies investigating AOD misuse have been conducted in LMICs in general EC populations. Examples are described below.

A study in Brazil identified 11% of their EC sample of 248 patients as risky drinkers (Boniatti et al., 2009). A Polish study, where research staff screened 1 913 EC patients, reported that 25.8% of the group were drinking at risky levels (Cherpitel et al., 2009). An EC study from South Africa, which screened 1 458 patients for AOD misuse using the ASSIST, found that 21% of the sample were drinking or using illicit drugs at moderate to high risk levels (Myers et al., 2012).

Despite the abundance of data, especially from HICs, reporting high levels of risky AOD use in EC patients and known high rates of mental disorder comorbidity in people using substances at risky levels (Grant et al., 2004), a limited number of studies have investigated the prevalence of mental disorder in EC populations.

Examples of studies exploring mental disorder in general EC populations are reported below.

A large study in a US EC investigated the prevalence of depression, psychological distress and risky AOD use in 5 641 adult EC patients (Booth et al., 2011). The measures used included the nine-item PHQ-9 and the Substance Abuse Outcomes Module (SAOM). The PHQ-9 scores showed that 23.4% of the participants suffered moderate to severe depressive symptoms. The SAOM results revealed that 5.9% of the sample met criteria for alcohol abuse, 5.9% for alcohol dependence, 3.8% for drug abuse and 5.1% for drug dependence.

Another US study sampled 211 patients presenting to an EC with non-mental disorder complaints (Downey et al., 2012). Using the MINI, the investigators found that 45% of their sample had at least one mental disorder diagnosis. The most common disorders identified included major depression (24%), generalised anxiety disorder (9%), drug abuse (8%), alcohol abuse (5%), psychotic disorders (5%) and suicidality (4%).

An Australian study ascertained that 20% of their general EC sample suffered from clinically significant anxiety and/or depressive symptoms as measured by the Hospital Anxiety and Depression Scale (HADS). Furthermore, 7.1% of their sample screened positive on the HADS and positive for harmful or hazardous alcohol use on the AUDIT (Kinner et al., 2005).

A study in a US EC recruiting patients presenting with any complaint for a study investigating the efficacy of universal HIV screening in ECs found that 31% of the sample completing the psychosocial questionnaires screened positive for depression using the CES-D tool (Mimiaga et al., 2010). Alcohol use history was obtained, as well as a history of previous mental disorder diagnoses. Six percent of the participants

reported having received a previous mental disorder diagnosis and 12.2% were probably alcohol dependent according to the AUDIT scores, while 3% admitted to having used illicit drugs in their lifetime.

Five hundred patients seen in a French EC were recruited for a study investigating the prevalence of mental disorder in an EC population (Saliou et al., 2005). Of their sample, 38% were diagnosed with at least one mental disorder using the MINI. Major depression was present in 16% of the sample, generalised anxiety disorder in 6.8%, alcohol dependence in 4%, PTSD in 2.8%, drug abuse in 0.8% and alcohol abuse in 0.6%.

Some investigators have explored suicidal symptomatology among EC patients, but mainly in adolescent populations (Newton et al., 2010; Wintersteen et al., 2007), with fewer studies being conducted with adult participants. Examples of studies involving adult participants are outlined below. A US study recruited 1 590 EC patients and found that 11.6% experienced passive suicidal ideation, 8.4% had thought about committing suicide and 2% had suicide plans (Claassen and Larkin, 2005). Symptoms of various mental disorders, including depression, anxiety and AOD use disorders, were self-reported by 97% to 98% of patients screening positive for suicidality. A similar study across six ECs reported that 7.3% of their 2 243-strong sample experienced passive suicidal ideation, 2.3% active suicidal ideation and 34.5% depressive symptoms (Allen et al., 2013).

In summary, at least one mental disorder was diagnosed in 38% to 45% of EC patients presenting with any complaint. Depression was reported in 16.1% to 24% of patients (Saliou et al., 2005; Downey et al., 2012) and moderate to severe depressive symptoms were found in 23.4% to 34.5% (Allen et al., 2013; Booth et al., 2011). Problem alcohol use, either in the form of high scores on screening tools or an alcohol use disorder diagnosis was found 11% to 62% (Boniatti et al., 2009;

Krupski et al., 2012). General EC patients display high prevalence rates of problem AOD use and mental disorders; although limited evidence is available from LMICs. The next section will explore these rates in injured EC populations.



2.3.3.2 Prevalence of mental disorders in injured EC populations

Of the specific patient groups studied in ECs, injured patients have received a reasonable amount of research attention, possibly due to the prevention opportunities available in this group, as well as the recurrent nature of injury presentations (Melzer-Lange et al., 2013; Sims et al., 1989). Most of these efforts have targeted AOD use in these populations and there is data available from both HICs and LMICs (Browne et al., 2013; Cherpitel, 2007; Plüddemann et al., 2004; Reis et al., 2006). Despite the number of studies conducted in ECs, a limited number of studies have investigated the prevalence of other mental disorders in injured and, specifically, violently injured patients. Since high rates of harmful or hazardous AOD use have been well documented in injured EC patients, the focus will be on studies examining the prevalence of other mental disorder symptoms or diagnoses. Firstly, a brief overview of AOD-related EC data from either patients presenting with any injury or with unintentional injuries in HICs and LMICs will be presented. Thereafter, studies examining other mental health factors identified in injured patients will be discussed. Then mental disorder symptoms and diagnoses investigated in violently injured patients will be reviewed and finally, the associations with mental disorder symptoms or diagnoses in these patients will be presented.

2.3.3.2.1. Prevalence of AOD use in injured EC patients

A number of studies have investigated AOD use in EC patients presenting with an injury of any kind. Some investigators have relied on self-report measures for measuring AOD use, while others have relied on biological markers such as blood

alcohol concentration or approximation of blood alcohol concentration on alcohol breath testing. The majority of studies have focused on alcohol and not on illicit drugs or prescription drug misuse.

Data regarding self-reported alcohol consumption in the six hours preceding an injury has been reported from many HICs. Figures from the USA range from 12% to 35% (Cherpitel, 1997), while data from Australia and New Zealand were in the higher range: 22% to 44% (Cherpitel et al., 2005; McLeod et al., 1999). Studies using biological markers found similar levels: 15% to 31% in Australia and New Zealand (Cherpitel et al., 2005; Stockwell et al., 2002); and 11% to 22% in the USA (Cherpitel, 1997; Williams and Vinson, 2001). Fewer studies have examined indicators of harmful or hazardous drinking or have reported the prevalence of alcohol use disorders in injured EC populations. The rates of an actual alcohol use disorder or a positive screen for harmful or hazardous use were found to be positive in up to 25% of injured US EC patients who do use alcohol (Cherpitel, 1997), 45% of injured drinkers in Canada (Cherpitel et al., 1999) and 20% of all injured patients in Sweden (Cherpitel et al., 2005).

A limited number of studies are available on illicit drug use in injured EC populations. A review conducted in 2006, searched for EC studies published in 2003 or earlier, examining illicit drug use in the six hours prior to injury in injured patients (Vitale and van de Mheen, 2006). Only eleven studies were located and the prevalence of illicit drug use was found to be 35% in Leeds, UK (Carrigan et al., 2000) and 74.5% in Philadelphia USA (Lindenbaum et al., 1989). Other studies have looked at illicit drug use within the preceding three months, for example an EC study in the US which recruited injured problem drinkers and found that 59% of their sample had used illicit drugs in the time frame studied (Woolard et al., 2003). Another US EC study collected data on the number of previous drug-use days in the preceding month and also utilised a measure of severity of AOD use problems, the University of Arkansas

SAOM (Cunningham et al., 2003). Of the patients presenting with violent injury, 36.4% had used illicit drugs in the preceding month. Illicit drug use also significantly increased the risk for violence involvement in their injured sample.

Furthermore, studies examining the combination of AOD use in injured patients found significantly increased risks for those patients using alcohol and illicit drugs and this risk was particularly high for violence-related injuries (Cherpitel et al., 2013; Woolard et al., 2003). For example, a study in Canada found that 5.4% of their injured patients had been using alcohol and drugs and these patients constituted 27.8% of the violence-related injuries group and only 3.3% of the unintentionally injured group (Cherpitel et al., 2013).

The predominant psychosocial factor explored in LMIC studies targeting injured EC patients is also AOD use (Bowley et al., 2004; Parry et al., 2005; Plüddemann et al., 2004). Studies have found extremely high rates of AOD use associated with injuries. For example, data from Belarus, Mexico and India found that between 17% and 32% of injured patients tested positive for alcohol on breath or blood analysis (Cherpitel and Borges, 2001; Cherpitel et al., 2005; Cherpitel, 2007). A review of the associations between alcohol and injury in ECs, found that injured patients were more likely to report drinking prior to an injury and that this association was particularly strong for patients presenting with a violence-related injury (Cherpitel, 2007). Studies performed in South African state hospital ECs documented that between 36% and 79% of injured patients had been using alcohol just prior to their injury (Peden and Bautz, 2000; Plüddemann et al., 2004) and between 33% and 62 % had been using illicit drugs (Parry et al., 2005). While many of the studies conducted in other HIC and LMIC emergency contexts elicit histories of AOD use, they were mainly limited to the time period immediately preceding the injury and very few attempt to diagnose AOD use disorders (Cherpitel, 2007), thus the investigators were not able to identify individuals at increased risk of further AOD-related harm.

Furthermore, the prevalence of other mental disorders in these settings has not been explored.



2.3.3.2.2. Prevalence of other mental disorders in EC patients presenting with any injury or unintentional injuries

Studies from HICs suggest that injured patients presenting to ECs represent an at-risk group for mental disorders. Many of these studies have sampled patients presenting with any injury, or only those with unintentional injuries. A few of these studies have reported the prevalence of any mental disorder in injured EC patients, all of them from HICs (O'Donnell et al., 2009; Richmond et al., 2007; Wan et al., 2006). A number of these studies have found that patients presenting with an injury were more likely to meet criteria for a pre-existing mental disorder than their non-injured counterparts or the general population (Dicker et al., 2011; O'Donnell et al., 2009; Poole et al., 1997; Wan et al., 2006). A high proportion of these studies have accessed inpatient populations following their admission from the EC (O'Donnell et al., 2009; Poole et al., 1997), while others have recruited and interviewed their sample during the EC visit (Richmond et al., 2007). Data from studies recruiting patients with any injury, or an unintentional injury only from wards or ECS will be outlined first. Thereafter studies will be reported which either recruited patients presenting to ECs with violence-related injuries or recruited those patients disclosing previous experiences of violence victimisation or perpetration.

A US study sampled patients presenting with minor injuries to an EC (Richmond et al., 2007). A number of exclusion criteria were applied. Patients under the age of 18 years old and those who had received medical care for an injury in the previous two

years were excluded. Patients presenting with injuries due to domestic violence or a comorbid medical illness were also excluded, as well as those patients currently receiving treatment for major depression or a psychotic disorder were excluded. The SCID was used to diagnose mental disorders in the sample, finding that 44.7% of the participants met criteria for at least one past or current mental disorder. Current mental disorders were found in 15.6% of the sample and 7.3% met criteria for a current mood disorder, 2.5% for a current alcohol use disorder and 1.1% for a current drug use disorder.

In a retrospective study conducted in the US, data from 1 709 patients admitted for an unintentional injury were examined. Of the sample, 20% were diagnosed with a mental disorder and when taking into account the local population served by the hospital, those with a mental disorder were almost twice as likely to be admitted for an unintentional injury (Wan et al., 2006). This study did not include EC patients discharged directly from the EC and only accessed retrospective data; therefore the diagnosis of a mental disorder could have been missed as they are often overlooked in ECs where patients mainly present for non-mental disorder complaints (Claassen and Larkin, 2005).

Five ECs in Australia provided sites for a multicentre study of mental disorders in injured inpatient populations (O'Donnell et al., 2009). In the 1052 unintentionally injured participants, 63% were diagnosed with a mental disorder when interviewed using the MINI. Major depression was diagnosed in 30.1%, alcohol abuse in 18.5% and alcohol dependence in 35.7% of the sample. PTSD was present in 12.9% of the sample and generalised anxiety disorder in 9.9% of participants. Patients who were currently suicidal were excluded from the study. The investigators compared the results to US population norms, concluding that the EC patients displayed higher rates of mental disorders than the general population.

A further US study, recruiting inpatients admitted to hospital wards with an unintentional injury, found that 64% of their sample were diagnosed with any current mental disorder using the MINI and 35% met criteria for more than one disorder (Dicker et al., 2011). A major depressive episode was diagnosed in 18% of the sample, any anxiety disorder in 30%, an alcohol use disorder in 38% and 26% of the sample met criteria for a drug use disorder. The investigators compared their findings with US population norms, noting that the prevalence of mental disorders in their injured EC population was twice that of the general population. Any AOD use disorder was found in 48% of the EC sample, ten times the prevalence reported in the US population. Similarly, the rate of major depression found in the EC sample (18%) was substantially higher the population figure of 2%.

A Canadian study found that patients hospitalised for the care of any injury were over nine times more likely to have been hospitalised for a mental disorder prior to the injury admission, and over three times more likely to have submitted mental health physician claims than the matched non-injured cohort. Of these claims over 80% were for depression, panic or anxiety symptoms (Cameron et al., 2006). The retrospective study design most likely resulted in an underestimation of the mental disorders present in the study population.

A US study compared three groups of patients admitted to hospital: those admitted with a violence-related injury, a group who had suffered unintentional injuries and a comparison group of patients who had undergone elective surgery (Poole et al., 1997). The patients were interviewed using the Psychiatric Diagnostic Interview Revised (PDI). In the elective surgery group at least one mental disorder was diagnosed in 30% of the participants as compared to 50% in the unintentionally injured group.

Thus, injured patients are an at-risk group for AOD use and mental disorders. Between 20% and 64% of unintentionally injured patients have at least one mental disorder, displaying higher prevalence rates than other healthcare users and the general population (Dicker et al., 2011; Wan et al., 2006). Furthermore, some researchers have found that patients presenting with injuries due to interpersonal violence or having experienced a previous violent injury, are even more likely to experience symptoms of mental disorders (O'Donnell et al., 2009); although few studies have explored this.

2.3.3.2.3. Prevalence of other mental disorders in EC patients presenting with violence-related injuries

The investigation of mental disorders amongst patients presenting with an injury due to an assault, has often focused on specific populations, such as adolescents (Ranney et al., 2013) or adult patients with histories of IPV (Schrager et al., 2013). Some investigators accessed EC patients presenting with any complaint but have elicited histories of past incidents of violent victimisation or perpetration and then examined factors associated with having experienced these violent incidents. These studies will be presented in this section, along with data from patients actually presenting with injuries due to violence. First, the studies involving adolescents and young adults will be reviewed and thereafter, data from adult EC populations.

A US study recruited 168 adolescents aged 10 to 15 years of age presenting to an EC with a peer assault injury (Anixt et al., 2012). The investigators then interviewed the parents regarding any history of previous mental health diagnoses in the adolescents and utilised the Child Behavior Checklist to elicit symptoms of mental disorders present in the adolescents. At least one mental disorder was diagnosed in 28% of the participants and depression in 15.5%.

Adolescents aged 12 to 19 years old were recruited from another US EC after presenting with a violence-related injury (Cheng et al., 2003). Modules from the

Youth Risk Behavior Survey were included in the interview battery in order to screen for behavioural problems. Three groups were accessed for the study: 133 youth presenting with violence-related injuries, 133 presenting with unintentional injuries and 133 presenting with a non-injury complaint. Of the violently injured youth, 33% were found to have an emotional or behavioural problem, 7% had experiences suicidal ideation and 5% had attempted suicide in the year preceding the interview. The youth presenting with violence-related injuries were more likely to screen positive for emotional or behavioural problems than the unintentionally injured or non-injured youth (33% vs 25% vs 23%).

A clinical trial providing a motivational interviewing-based brief intervention, recruited adolescents aged 14 to 18 years who self-reported past-year aggression and alcohol use (Cunningham et al., 2009b). A proportion of the baseline data was utilised for this paper. Of the 533 individuals whose data was utilised, 52.5% were binge drinkers as identified by the AUDIT-C tool, 49% screened positive for alcohol abuse on the CRAFFT Screening Test and 67.2% admitted to illicit drug use in the past year. Another study which also sampled participants in this trial, looked at data for 624 adolescents and reported that 22.8% screened positive for moderate to severe depressive symptoms on the CES-D (Ranney et al., 2013).

The studies available which have investigated mental disorders in adult EC patients have either recruited patients presenting with any violent injury type (O'Donnell et al., 2009), or have focused on a particular category of violent injuries, such as those sustained as a result of IPV (Houry et al., 2006). Results from studies looking at any violent injury type will be presented first.

Part of the sample recruited for the Australian study mentioned above consisted of 75 participants with violence-related injuries out of the 1 127 patients recruited for the study (O'Donnell et al., 2009). The violence-related injuries group displayed

higher rates of mental disorders than the unintentionally injured group mentioned above (78% vs 63%). These higher rates were present across all mental disorder categories. Major depressive disorder was diagnosed in 46.7% of the violence-related injuries group, generalised anxiety disorder in 16%, PTSD in 22.4%, alcohol abuse in 53.3% and alcohol dependence in 37.3%.

One of the groups recruited for a ward-based study in the US had suffered violence-related injuries (Poole et al., 1997). In this group, 63% of the participants met criteria for a mental disorder in contrast with the 30% and 50% found in the elective surgery group and the unintentional injury group, as mentioned previously.

A Mexican study recruited 127 victims of violence from three ECs, finding that 31.4% of these patients displayed high levels of depressive symptoms on the CES-D, while 18.9% of the sample met criteria for alcohol abuse or dependence. Of the population-based controls, 15.2% of had high depression scores and 5.1% were diagnosed with alcohol abuse or dependence (Borges et al., 2004).

A study in a Brazilian EC screened 701 female EC patients aged 15-49 years for violent lifetime experiences by any perpetrator (Silva and Aquino, 2008). Of the patients screened, 342 women (48.8%) reported violent experiences in their lifetime and 273 completed the interview. Of the women who had experienced violence, 66.5% had been harmed by an intimate partner. The violent experiences included lifetime sexual violence, lifetime physical violence or psychological violence experienced within the previous 12 months. The women were then interviewed with the SRQ-20 and 77.3% of the 273 women scored above threshold for psychological distress on this screening tool.

A number of studies have explored the combination of IPV and mental disorders in EC patients. A US study interviewed 610 female African American EC patients aged

21-55 years regarding experiences of IPV, AOD use and depression (Hankin et al., 2010). Twenty percent of the sample had experienced IPV previously. Of the IPV group 49.4% scored above threshold on the BDI, 47.1% on the Tolerance, Worried, Eye-Opener, Amnesia, (K)Cut down (TWEAK) screening tool for alcohol dependence and 44.7% on the DAST for drug dependence.

Another US study recruiting African American EC patients recruited 569 women who responded to questions regarding IPV and mental health symptoms (Houry et al., 2006). IPV was disclosed in 36% of the 461 women who had been in a relationship in the preceding year. The BDI-II was utilised to interrogate depressive symptoms and 24% of the sample (n=461) scored 20 or more indicating significant depressive symptoms and 6% of the group were found to have severe suicidal ideation as measured by the Beck Scale for Suicidal Ideation. Furthermore, moderate to severe PTSD symptoms on the Posttraumatic Stress Diagnostic Scale were reported by 15% of the sample.

As part of an IPV screening and intervention study, 1 474 women presenting with any complaint were screened in three US ECs for IPV, drug abuse using the DAST-10 tool, alcohol abuse on the TWEAK scale and depressive symptoms using the BDI (Schrager et al., 2013). Current IPV was identified in 17.8% of those screened and 59% of these women agreed to be involved in the study. Alcohol abuse was found in 65.7% of the participants, drug abuse in 26% and above-threshold depressive symptoms in 50%.

An Australian study recruited 358 adult female participants, of whom 49.4% had at least one previous IPV experience (Roberts et al., 1998). Of this subset of the sample, 38.1% met criteria for depression on the CIDI, 16.4% for anxiety and 11.9% for drug dependence. This group also had higher rates of harmful or hazardous alcohol use on the AUDIT as compared to the non-abused group.

A single study was found which interrogated mental disorder symptoms and IPV victimisation or perpetration in male EC attenders (Rhodes et al., 2009). IPV perpetration, victimisation or bidirectional IPV was disclosed in 37%. IPV victimisation only was reported by 20%, IPV perpetration only by 5% and bidirectional IPV by 11% of the total sample. Of the IPV group 18.4% were found to have moderate to severe depressive symptoms on the BDI-II, 10.3% reported significant levels of PTSD symptoms on the Posttraumatic Stress Diagnostic Scale and 9.2% had severe suicidal ideation the Beck Scale for Suicidal Ideation. Drinking at risky levels was self-reported on the CAGE tool by 49% of the IPV group.

In summary, adolescent and adult patients have at least one underlying mental disorder in 28% to 78% of those injured due to interpersonal violence (Anixt et al., 2012; O'Donnell et al., 2009). Moderate to severe depressive symptoms were identified in 22.8% to 31.4% (Borges et al., 2004; Ranney et al., 2013) and major depression in 15.5% to 46.7% of these patients (Anixt et al., 2012; O'Donnell et al., 2009). Risky alcohol use or an actual diagnosis of alcohol abuse was identified in around 50% of these patients (Cunningham et al., 2009b; O'Donnell et al., 2009). IPV victims, and perpetrators, seen in ECs often have underlying mental disorders and harmful or hazardous AOD use behaviours. For example, between 18.4% and 50% of the participants in the above studies self-reported above-threshold depressive symptoms on the BDI (Rhodes et al., 2009; Schrage et al., 2013) and 47% to 75.7% disclosed hazardous or harmful alcohol use on screening tools (Hankin et al., 2010; Schrage et al., 2013).

Thus, patients presenting with injuries due to interpersonal violence and those disclosing histories of violence are at-risk for mental disorders and AOD use problems. Few investigators have used diagnostic interviews to explore the full range of mental disorders and none have used this approach in LMICs. Despite the

high rates of mental disorders and psychological distress, few investigators have explored factors associated with symptoms of mental disorders or AOD use problems in injured EC patients, particularly in LMICs. **Chapter 3 of this thesis aims to address this gap and answer the research question, ‘What is the prevalence of mental disorder in injured South African EC patients?’ associated with objective 1.**

2.3.3.3 Factors associated with mental disorder in EC settings

A limited number of studies have explored predictors of mental disorders, apart from AOD use problems, in ECs. Examples of these studies are reported below. First, factors associated with AOD use problems in EC patients will be mentioned briefly and thereafter studies investigating associations with other mental disorders.

Investigators exploring the associations of risky AOD use in EC patients have found factors such as male gender, younger age and symptoms of mental disorders to be significant predictors of these problems and the use of substances in one category often predicts the use of other substances (Browne et al., 2013; Macias Konstantopoulos et al., 2014; Sanjuan et al., 2014).

A US study screened 1 945 EC patients for depressive symptoms on the CES-D and further investigated predictors of depression in their sample. The investigators found that factors associated with increased depression scores included female gender, unemployment, a lower category of annual income, alcohol dependence and current smoking (Mimiaga et al., 2010).

A US study recruiting adolescents aged 14 to 18 years who self-reported past-year aggression and alcohol use also interviewed the subjects regarding depressive symptoms on the CES-D (10 item), violence experiences and alcohol use (Ranney et al., 2013). Of the 624 adolescents in their sample, 22.8% were found to have severe depressive symptoms (>14 on the CES-D 10). The investigators found that female gender, younger age, poor academic performance, binge drinking on the AUDIT,

partner violence, high levels of exposure to community violence and use of illicit drugs were associated with severe depressive symptoms.

An Australian study interviewed 346 female patients in an EC regarding IPV, alcohol misuse on the AUDIT and mental disorders using the CIDI. Lifetime mental illness was predicted by IPV experiences, and AOD use disorder diagnoses were predicted by childhood abuse (Roberts et al., 1998). Specific categories of disorders were predicted by certain experiences of abuse. Adult abuse was associated with lifetime depression, anxiety and phobias, while child abuse predicted drug dependence and phobias.

A Large US study recruited over 1000 male EC patients and screened for IPV victimisation and perpetration, depression on the BDI-II, PTSD utilising the Posttraumatic Stress Diagnostic Scale and suicidal symptoms with the Scale for Suicidal Ideation (Rhodes et al., 2009). Experiences of both IPV victimisation and perpetration were associated with higher levels of mental disorder symptoms, particularly depressive symptoms with bivariate analysis.

A further US study examined mental health and AOD use in a sample of 5 641 adult EC patients (Booth et al., 2011). Measures used included the PHQ-9, the Short Form-12 Health Survey (SF-12) and parts of the SAOM. Predictors of low mental health functioning and depression included female gender, unemployment and AOD abuse and dependence. Interestingly, binge drinking in women was strongly associated with depression, but this relationship was not found in male binge drinkers. In this study, injury presentation was inversely associated with poor mental health functioning and depression. The cause and intent of the injury was not documented, thus the proportion of violently injured patients is not known.

In summary, factors associated with depression were the most commonly studied associations in the EC literature and a broad range of variables were associated with higher depression scores on screening tools. Sociodemographic factors such as female gender, unemployment and low annual income were associated with depression, as well as problem AOD use and high levels of exposure to community violence (Booth et al., 2011; Mimiaga et al., 2010; Ranney et al., 2013). The only study investigating predictors of mental disorder other than depression found that IPV predicted depression, anxiety and phobias, while experiences of abuse in childhood predicted drug dependence, anxiety and phobias (Roberts et al., 1998). There is little data available from HICs regarding predictors of mental disorders in EC populations, and no studies from LMICs were found which have investigated these factors.

Thus, no studies investigating the predictors of mental disorders, including AOD use disorders, have been conducted in South African ECs. **Chapter 3 of this thesis aims to address this gap and address objective 1.**

Not surprisingly, there is a strong association between mental health and injuries, and this association has been studied in a variety of contexts. The next section will briefly outline the evidence on the intersection of injury and mental disorder, providing background to the approach adopted in this thesis, i.e. investigating these two conditions simultaneously.



2.4 The intersection between mental health and injury

Mental disorders and injury are both highly prevalent and make significant contributions to the global burden of disease as described in previous sections. (See sections 2.3 and 2.5.) Therefore, mental disorders and injury are both significant public health problems; yet this is not the only link between these two diverse conditions.

First, mental disorders and violence-related injury share a number of risk factors. For example, risky AOD use has been implicated as a causal factor in violence victimisation (Zerhouni et al., 2013) as well as conferring risk for mental disorders other than AOD use disorders (Degenhardt et al., 2013; O'Donnell et al., 2013; Viner and Taylor, 2007). Regarding violent injury, some investigators have suggested that alcohol use in the six hours prior to a violence-related injury is more strongly associated with these injuries than a diagnosis of an alcohol use disorder (Borges et al., 2004); although the link with alcohol use disorders has been studied less frequently than consumption prior to the injury event.

Another factor implicated in conferring risk for mental disorders and injury is witnessed violence in varying contexts. Experiences of witnessed violence, within the home or the community, have been shown to be detrimental for children and young adults in a number of ways. These children and youth are more likely to develop mental disorders such as depression and PTSD, and they are more likely to engage in violent incidents as a perpetrator, as well as being more vulnerable to victimisation (Duke et al., 2010; Fowler et al., 2009; Scarpa, 2003; Shields et al., 2008).

Second, violence-related injury itself can be a trigger for mental disorders such as AOD use disorders, depression and PTSD (Bryant et al., 2010; O'Donnell et al., 2009). Certain populations have often been investigated regarding the development of

mental disorders post-injury. For example, studies recruiting female IPV victims (Golding, 1999) and car crash victims (Bryant et al., 2004) are prominent in the HIC literature. In South Africa, interpersonal violence was explored as a risk factor for a range of health conditions in the South African Comparative Risk Assessment study (Norman 2007a). Interpersonal violence was found to be the second leading cause of DALYs, accounting for 10.5% of all DALYs and a good proportion of these DALYs were due to mental disorders and AOD use. AOD use, major depression and anxiety disorders contributed 23.5%, 21% and 14.3% respectively to female DALYs caused by IPV. For child abuse in females, 78.2% of the associated DALYs were due to mental disorders and AOD use and in males, 93% of the associated DALYS.

Third, mental disorders have been identified as a risk factor for violence and violent injury; although this has attracted some controversy. Some authors argue that having a mental disorder places an individual at risk for injury, or violence involvement (Kooyman et al., 2007). Disorders such as schizophrenia-spectrum disorders, depression, PTSD and AOD use disorders have all been implicated. Results from a New Zealand birth cohort study suggest that alcohol dependence, marijuana dependence and schizophrenia-spectrum disorders are significantly associated with violence (Arseneault et al., 2000). One-fifth of the cohort had at least one of these three diagnoses and this subset of the cohort accounted for over 50% of the self-reported violent offenses. Moreover, the authors reported that AOD use prior to the injury, perceived environmental threat and a prior history of conduct disorder accounted for part of the risk for violence involvement conferred by the mental disorders, but did not fully explain the link.

Other investigators have suggested that the link between mental disorders and violence is a more complex interaction and that mental disorders alone do not confer violence risk. For example, a study examining data from the National Epidemiologic Survey on Alcohol and Related Conditions in the US confirmed the link

between serious mental disorder and violence, but the authors argued that the link is better explained by other factors such as recent life stresses, criminal histories and AOD abuse (Elbogen and Johnson, 2009). This view is supported by other researchers who also suggest that the violence risk is mainly due to AOD use and not the mental disorder alone (Fazel et al., 2009). Further research is needed in EC and other contexts.

The high levels of comorbidity of AOD use disorders, mental disorders and interpersonal violence-related injury in community and EC populations (Grant et al., 2004; McGinty et al., 2012; O'Donnell et al., 2009), suggest that it is important to explore the associations and environments in which these injuries and disorders occur. Furthermore interventions for patients presenting with injuries and/or mental disorders could be advantageous in reducing the prevalence and consequences of these conditions.

The next section will explore the global burden of disease due to interpersonal violence as well as the prevalence and predictors of violence-related injuries. This section will provide further background for objective 1.

2.5 Interpersonal violence-related injury

In the *World report on violence and health* (Krug et al., 2002), the WHO defined violence as:

“The intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation.”

Interpersonal violence-related injury is the focus of this thesis. (See Figure 2.2 below.) Community and family/partner scenarios are included in the scope of this thesis, but excluding child abuse.

A typology of violence

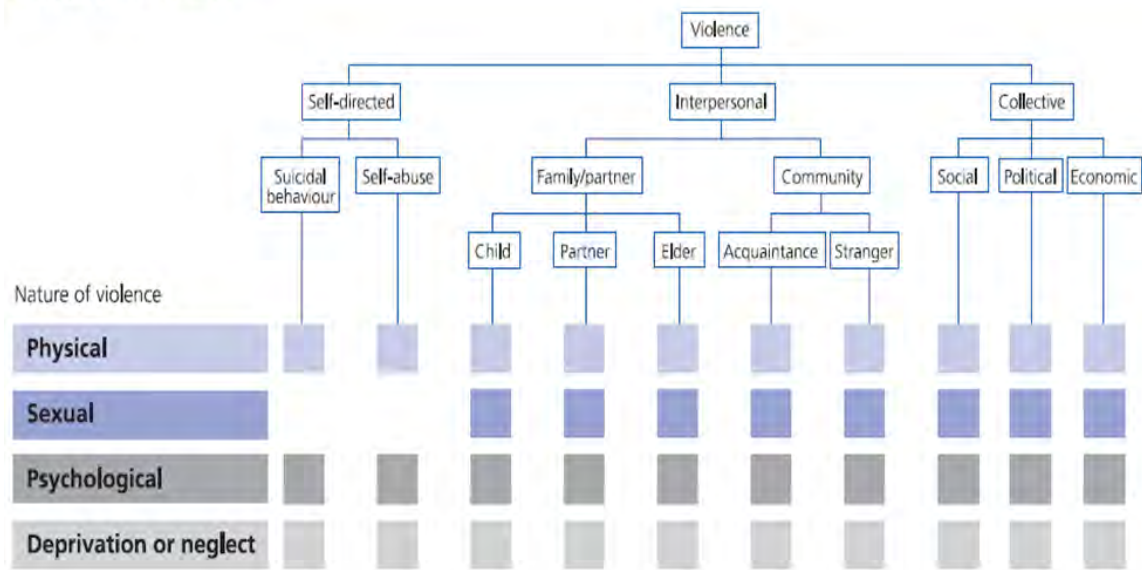


Figure 2.2 WHO typology of violence (Krug et al., 2002)

In the following sections, the burden of disease and prevalence of interpersonal violence-related injuries seen in mortuaries and ECs will be discussed. Thereafter, evidence regarding predictors of violence-related injury in these settings will be presented.



2.5.1 Prevalence of violence-related injury and global burden of disease

Violence is a global phenomenon, yet there are vast differences in prevalence rates across geographical regions, income per capita groupings of countries, gender and age groups. The WHO African and Eastern Mediterranean regions appear to experience the highest rates of overall violence, with LMICs reporting a greater

burden of violence than HICs. For every one death due to violence in an HIC, nine people die in an LMIC (World Health Organization, 2008).

Age-standardised violence mortality rates for countries like the US and Australia are 5.9 and 1.3 respectively. LMICs, such as Venezuela, Côte d'Ivoire and South Africa, demonstrate far higher rates: 39.2, 52.4, and 67.9 deaths per 100 000 population (WHO Department of Measurement and Health Information, 2009). Globally, men are considerably more affected by violence with 32.9 violent deaths per 100 000 males, compared to 11.8 per 100 000 females (WHO Department of Health Statistics and Informatics, 2011). With the exception of the 0-4 age group, the gap in mortality rates between males and females is substantial. Furthermore, young people are most at risk for all types of violence, especially in the 15-44 year age group.

High mortality rates due to violence in young people are particularly high in the 20-24 year age group where violence causes 8% of all deaths in this category and is the third highest cause of mortality (Patton et al., 2009). The percentage of deaths caused by violence climbs to 12% in the males aged 20-24 years and is second only to road traffic crashes. From early adolescence to young adulthood, mortality due to violence increases seven-fold in young males. This increase is especially prominent in LMICs in Africa and the Americas.

Since violence does not only cause mortality, but also considerable morbidity, violence-related injuries also feature prominently in the list of DALYs in young people (Gore et al., 2011). Similar to the pattern found in mortality rates, violence-related injuries play a significant part in healthy years of life lost in young adult males, contributing 8.1% of DALYs in the 20-24 age category. In certain regions, such as Sub-Saharan Africa, violence contributes markedly to overall DALYs in people of all ages. Interpersonal violence occupies the fifth position in the DALY list for Sub-Saharan Africa (Murray et al., 2012). (See Table 2.1 above.)

In most countries, the majority of causes of injury and DALYs are due to road traffic crashes, yet in a few LMICs, like Colombia and South Africa, the leading cause of injury is interpersonal violence (Norman et al., 2007b; Institute for Health Metrics and Evaluation). Moreover, in South Africa, interpersonal violence plays a far greater role in DALYs than is evident in the regional Sub-Saharan Africa DALYs list. Interpersonal violence in South Africa contributes the second greatest number of DALYs and is only outstripped by HIV/AIDS (Norman et al., 2006; Norman et al., 2007b).

In 2008, violence was responsible for one-third of non-natural deaths recorded in a mortuary surveillance database in South Africa which included mortuaries across the country (Donson, 2009). The majority of the victims were male, with over six times more male than female victims. Sharp objects caused the deaths in 40% of violent deaths, firearms in 29.4% and blunt force in 20.4%. In the age categories 15-24, 25-34 and 35-44 years of age, violence was the leading cause of non-natural death and most of these deaths occurred on weekends. Blood alcohol levels were available for 43% of the violence victims, and of these samples, 61% screened positive for alcohol.

Thus, violence is an important public health problem, globally and particularly in LMICs. Among LMICs, South Africa is one of the countries where violence-related injury is a major contributor to the burden of disease and especially in the age group 15-44 years of age. Although, much of the evidence available on violence is based on mortuary and police data, the main health impact is caused by people sustaining non-fatal injuries. For example, in violently injured youth, for every one mortality 20-40 youth sustain a non-fatal injury (Krug et al., 2002). These data are important for defining the scope of the problem, yet evidence is mainly available from HICs.

Systems from HICs, such as the US and the UK, have been in operation for a number of years and provide valuable injury and injury care information (Hashmi et al., 2013; Lecky et al., 2000). A regional approach to injury monitoring has also been developed. The European Injury Data Base, encompassing HICs and LMICs, was implemented by the European Union as a result of the JAMIE project 2011-2014 (Joint Action for Injury Monitoring in Europe) (Bauer et al., 2014). Similarly, in North America and Australasia, the North American National Trauma Data Bank and the Australian and New Zealand National Trauma Registry have been developed (Zafar et al., 2012; Palmer et al., 2013). A limited number of LMICs have effective national injury surveillance systems in place. In some instances, the systems rely only on hospital data (Ward et al., 2002), while the main data source used for many national systems is mortuary or police data (Donson, 2009; Road Traffic Management Corporation, 2010). A combination of these sources has been recommended in order to properly define the extent of the injury burden (Krug et al., 2002). South Africa does not have routine injury surveillance systems in place, but relies on police crime statistics, mortuary data as collected by the National Injury Mortality Surveillance System (Donson, 2009) and, in Cape Town, periodic rapid assessments of injury presentations (Mureithi et al., 2013). Thus, South Africa does not have adequate non-fatal injury statistics which are desirable when equipping healthcare services to respond to the injury burden. Furthermore, these injuries often overburden emergency, surgical and rehabilitative services as well as families and communities with the economic and social consequences of such injuries (Livingston et al., 2014; Lyons et al., 2010).

2.5.2. Prevalence and associations of violence-related injury in EC settings

The main factors which have been explored in relation to violence-related injury presentation are AOD use, measured by either self-report or biological markers.

Studies from ECs in HICs and LMICs are available, but the majority of studies report only the number of injured patients seen, mechanism of injury (for example, stab

wound), location and severity of injury, and patient disposition, i.e. whether the patient died, was admitted to hospital, went to theatre or was discharged straight from the EC (Mollen et al., 2003; Ward et al., 2010). A limited number of studies have examined factors other than AOD misuse in relation to presentation for violence-related injury and of the studies available, the majority were conducted in HICs. First, examples of studies examining the prevalence of violence-related injury, including the prevalence of recurrent injury, and nature of violent injuries in HIC and LMIC ECs will be presented. Thereafter, data from South African ECs will be discussed. Lastly, factors associated with presentation for violence-related injury will be described. The role of AOD misuse has been presented above; therefore the focus will be on other factors investigated in relation to these injuries in EC settings.

2.5.2.1 EC presentation for violence-related injuries: HICs

Trauma registries in HICs are a rich source of data and many authors have taken advantage of these data sources. These registries may be international, national, regional or from a single hospital or network of hospitals (Dinh et al., 2014; Haider et al., 2014; Newgard et al., 2013; Ward et al., 2010). Furthermore, studies have also been conducted in single EC sites, or across multiple sites in HICs. These studies have looked at numerous variables from injury severity and intent, to predictors of violent injury presentation. Examples of studies are reported below.

The UK trauma registry, known as the Trauma Audit and Research Network (TARN) database has been utilised for a number of papers. One such study explored paediatric (up to the age of 15 years old) trauma cases from 1990 to 2005 recorded in the database (Bayreuther et al., 2009). Violence-related injuries accounted for 2% of all injuries recorded. This study did not report any particular characteristics related to a specific mechanism of injury, but rather analysed the injury pattern. For example, the investigators reported which part of the body was injured and whether more than one area was involved, such as the head and abdomen or an isolated

area, such as a limb injury only. The investigators explored the predictors of mortality in these children, such as the body region injured or the Glasgow Coma Scale on arrival.

A US study conducted in three ECs over nine months in 1999, collected data on patients aged 8-24 years old presenting for interpersonal violence-related injury, excluding child abuse and IPV (Mollen et al., 2003). Of the sample recruited, 59.6% were male and 46% were 8-14 years old. Mechanisms of injury included fists, feet or hands in 49%, blunt objects in 14%, guns in 11% and sharp objects in 10%. The data was analysed by gender, showing that female victims constituted almost 50% of the sample and were more likely to be injured in the home, and less likely to suffer gunshot wounds than the male victims.

Ten years of data from an Australian major trauma centre were analysed and information regarding 2 380 victims of major violence-related trauma, excluding IPV, was extracted (Dinh et al., 2014). These patients were defined as presenting with major trauma if they had presented with injury severity scores above 15, along with intensive care unit admission or death. Of these victims, 85% were male and the median age was 32 years old. Males were more likely to suffer penetrating trauma, more severe injuries and present with clinical evidence of alcohol intoxication than females.

Investigators from a Belgian trauma centre noted that 95% of the violently injured patients presenting to their EC were male and between the ages of 20 and 40 years old (El-Abdellati et al., 2011). Over a quarter of the patients presented were under the influence of AOD and ethnic minorities were over-represented in their sample (77%). The majority of the stab wound patients (55%) presented with wounds to the trunk.

Various categories of injury presentation are often reported in the data, such as female victims of IPV, or those presenting with maxillofacial injuries due to interpersonal violence (Brink, 2009; Businger et al., 2012). Examples of these studies are reported below.

The trauma registry of a Swiss EC revealed that, over an 11 year period, 1 585 patients were seen with cranio-maxillofacial injuries caused by violence (Businger et al., 2012). The median age of these patients was 26 years and the age range was reported as 12 to 82 years. Patients under the influence of substances at the time of injury comprised 41% of the sample, and the mechanism of injury was force applied by a body part of the assailant in 83% of the cases, followed by blunt force (13%), sharp force (2%) and irritant gas (1 %). The most common injury pattern was injury to the left side of the face which was documented in 37% of the cases. Other studies reporting on maxillofacial injuries examined factors such as concomitant injuries, or the differences in presentation between male and female victims (Alvi et al., 2003; Brink, 2009).

A number of studies investigating IPV in ECs report on the physical patterns of injury, noting that head and neck injuries, including strangulation, are common in IPV victims (Perciaccante et al., 2010; Sheridan and Nash, 2007). Further injury factors reported are the types of injuries. A study in a Greek EC found that female IPV victims most often present with contusions or open wounds (72%), 18% present with concussions, 5% with dislocations and 4% with fractures (Petridou et al., 2002). Other investigators noted that most IPV injuries in women occurred at home and that excessive alcohol use by both partners plays a role in many IPV cases (Lipsky et al., 2005; Yau et al., 2013).

Studies from HICs include secondary data analyses from large national or regional databases (Bayreuther et al., 2009; Haider et al., 2014), as well as studies from single

ECs, or multi-centre studies (Dinh et al., 2014; Mollen et al., 2003). Many investigators have been able to provide an overview of injury presentations, often over a number of years, as they were able to access sophisticated trauma registries. Various factors are explored in academic publications including sociodemographic factors, injury location factors and other injury factors such as injury pattern and injury severity scores (Dinh et al., 2014; El-Abdellati et al., 2011; Godbold et al., 1996; Mollen et al., 2003). Thus the evidence from HICs regarding injury presentations is rich and varied, while the literature from LMICs is sparse and noticeably narrower in scope than the evidence from HICs.

2.5.2.2 EC presentation for violence-related injuries: LMICs

EC data from LMICs is available in the literature, although the focus is on factors such as injury mechanism, location of the injury on the body, where the injury was sustained amongst others, and few studies are available which investigate predictors of injury presentation. Most of the studies reported in the literature were conducted in a single EC (Thanni and Kehinde, 2006), with a limited number of studies utilising regional or multiple site data (Mutto et al., 2010; Ward et al., 2010). Examples of these studies are presented below.

Data from the Jamaica Injury Surveillance System, with coverage of 90% of the island's hospitals, showed that 38% of injured patients attending ECs had sustained injuries due to violence in 2004 (Ward et al., 2010). Males accounted for 58% of the patients presenting with violence-related injuries and young males aged 29 years and younger constituted over half of the men presenting for violence-related injuries. Blunt objects were used in 40% of the injuries, sharp objects in 31% and guns in 7%. Seventeen percent of patients seen for these injuries required hospital admission.

Staff from a Romanian EC collected data on violent injuries in their EC from March to November 2009 (Gal et al., 2012). Of the violently injured patients seen, 80.4% were

male and 72.4% were between 15 and 44 years old. Blunt force injuries were sustained in 22.4% and penetrating injuries in 7.5%. Sixty five percent of these patients were discharged directly from the EC, 24.6% were transferred to another hospital and 8.9% were admitted to the hospital where they presented for care of their injury.

A single-hospital Pakistani trauma registry collected data regarding 542 patients presenting with injuries from November 2010 to January 2011 (Mehmood et al., 2013). Of the 542 injured patients, 7% were treated for gunshot injuries. Other violence-related injuries were classified in the 'miscellaneous' category (16% of presentations), along with sports injuries, bites and occupational injuries. Further data from the violence-related injuries group was not presented. This report also included various quality indicators of pre-hospital and EC injury care such as the time taken to reach hospital and time spent in the EC.

Sub-Saharan African injury data has emerged from countries like Uganda (Mutto et al., 2010), Nigeria (Thanni and Kehinde, 2006), Tanzania (Chalya et al., 2013) and South Africa (Mureithi et al., 2013). As for other LMICs, the majority of studies presented data from single ECs (Hodkinson and Wallis, 2009), while some studies from Uganda and South Africa report data collected from multiple sites.

Trauma registry data from five regional hospital ECs Uganda shows that 7 415 patients presented for injury care from June 2004 to July 2005 (Mutto et al., 2010). Of these patients, 22% presented with violence-related injuries and 33% of those presenting with violence-related injuries were youth victims, aged 13-23 years old and the majority of the youth were above 18 years of age. Among youth victims, blunt force accounted for 45% of the injuries, sharp objects for 18% and guns for 12%. The number of patients discharged from the EC or admitted to hospital was not reported.

Data from a Nigerian EC shows that 1 078 patients were treated for injuries during 2003 and 1.9% of these presentations were for injuries sustained as a result of interpersonal violence (Thanni and Kehinde, 2006). Fourteen patients were recorded as having suffered a violence-related injury, while seven patients had gunshot injuries. Further information regarding these patients was not reported as the authors focused on those patients presenting with injuries due to road traffic incidents, who constituted 91% of their sample.

Violence-related injury data has been reported in national injury mortality reports (Donson, 2009) (reported above), a report from a limited injury surveillance project (Mureithi et al., 2013) and in various studies examining the characteristics of patients presenting to various ECs in the country (Pillay et al., 2012). Examples of studies are reported below, beginning with the latest injury surveillance data from Cape Town and followed by studies from single ECs.

Data regarding injury presentation was collected during September and October 2012 over eight days in six healthcare facilities in Khayelitsha, Nyanga and Elsies River (Mureithi et al., 2013). These three areas were previously identified by the Western Cape Department of Health as being among the top five areas with the highest alcohol-related violence levels. Of the 2725 cases seen during that period, 38.4% of patients presented for the treatment of any type of injury (i.e. unintentional or violence-related). Of all the patients seen, 23.2% had sustained a violence-related injury. Violence-related injuries accounted for 66% of male injury cases and 51% of female cases. Seventy percent of violence-related injury presentations were in male patients. Blunt force was the injury mechanism in 46.8% of cases, sharp force in 45.7% and firearms in 4.1%. Female victims mainly suffered blunt force injuries (74.5%), while male victims were more often injured by sharp force (56.5%). Violence was the leading injury type in patients aged 15-64 years old.

Staff noted probable alcohol consumption in 45.5% of the violently injured cases. Khayelitsha facilities attended to the highest proportion of violent injuries (37.6%), followed by Nyanga (34.4%) and Elsies River (12.3%). Some logistical challenges were reported by the investigators, including those related to outside staff collecting data in busy ECs, many of whom were not medically trained. This led to problems such as integrating the collection into the running of the ECs and misclassification of some injuries.

During August 2011, data from 1 465 trauma patients presenting to the trauma unit in a regional hospital in Durban were collected (Pillay et al., 2012). Injuries due to violence constituted 39% of the injuries seen during the study period and these injuries were responsible for 63% of the red-triaged patients (those who should be attended to immediately), and 57% of the orange-coded patients (those who should be seen within ten minutes of presentation). This paper reported waiting times for the patients in the study, but did not report patient disposition.

From October 2010 to September 2011 data from trauma admissions to Groote Schuur Hospital was collected via a trauma admission form (Nicol et al., 2014). Violence-related injuries accounted for a large proportion of the sample (37.9%) and for 46.9% of the male injury presentations. Sharp object assault injuries were the cause of 20.9% of all injury presentations, blunt object assault caused 17%, fists or feet assaults resulted in 5.4% of presentations and firearms in 4.8%. Limitations of this approach were mainly due to missing data on the admission forms. Variables such as injury type and cause were mostly noted, but others such as perpetrator characteristics and the type of violence were often not recorded.

A study conducted in Paarl from January to May 2008 found that 36% of the patients seen in the hospital EC presented for care of an injury due to any mechanism and that 66% of these injured patients were male (Hanewinckel et al.,

2010). Blunt force caused 56% of the injuries and sharp objects 33% of the injury presentations. Of the trauma patients seen, 64% were discharged directly from the EC, 12.9% were observed in the EC prior to being discharged from the EC, 8.4% were admitted and 3% were transferred. Unfortunately, injury intent was not documented in this paper.

A ten-day survey of EC patients was conducted in Elsie's River during November and December 2010 and the investigators found that about 20% of the caseload was due to injury (Govender et al., 2012). Of the injuries attended to, 70% were as a result of interpersonal violence and in those patients under the influence of alcohol, 87% presented for a violence-related injury. Over 50% of these cases came from five neighbourhoods near the community health clinic, which highlights the need for data-sharing between law enforcement agencies and medical facilities.

Injury caseloads in LMICs range from 2% in Nigeria to 38% of all EC presentations in Cape Town, South Africa (Mureithi et al., 2013). In a Ugandan study, violence-related injuries were responsible for 22% of the injury caseload (Mutto et al., 2010) (Hanewinkel et al., 2010) as compared to 36% in Paarl, South Africa and 38% in Jamaica (Ward et al., 2010). Male victims accounted for 58% of the violent injuries in Jamaica (Ward et al., 2010), 70% in Cape Town, South Africa (Mureithi et al., 2013) and 80% in Romania (Gal et al., 2012). In these LMIC studies, the sociodemographic and injury presentation factors are often reported.

Relatively few LMIC investigators have access to trauma registries, thus studies exploring trends over a few years or across regions are unattainable. Small cross-sectional studies account for the majority of the data in the LMIC literature. LMIC EC studies investigating the presentation for violence-related injury often report data such as the mechanism of injury (i.e. blunt force, sharp force, gunshots etc), the gender of the injured patients, time of presentation and location of injury (Govender

et al., 2012; Hanewinckel et al., 2010; Mureithi et al., 2013). Only two studies, both from South Africa, mention the use of substances around the time of injury presentation but these studies did not utilise self-report measures or biological markers of AOD use; they relied on the observational skills of the staff to identify those under the influence of substances (Govender et al., 2012; Mureithi et al., 2013). Therefore, the AOD use factors associated with injury should be investigated in LMIC populations in order to elucidate the prevalence of problematic AOD use in EC patients, as well as to ascertain the numbers of EC patients who could benefit from brief interventions in ECs. Furthermore, other known risk factors for injury, such as previous injury experiences, mental disorders and witnessed community violence could provide further information regarding the risk profile of these patients and indicate aspects which need intervention.

Once the prevalence of injuries and injury characteristics have been described, as in many of the LMIC studies described above, the next step in the public health approach is to identify factors associated with the condition. At the present time, there is limited data from LMICs regarding such factors and the overwhelming majority of the evidence has been collected in HICs.

2.5.2.3 Factors associated with EC presentation for violence-related injuries

A number of studies investigating factors associated with presentation for a violence-related injury or factors linked to past histories of violent experiences have been conducted in EC populations. The majority of the data has emerged from HICs, with US researchers being the main contributors to this field. Certain types of violent assault, such as IPV or youth violence, feature prominently in this literature. One of the most studied and frequently identified associations with injury across violence types has been alcohol and illicit drug use (Borges et al., 2008; Vitale and van de Mheen, 2006). Other associations found include factors such as mental disorders and weapon-carrying (Hankin et al., 2010; Zun et al., 2005). Studies recruiting adult patients will be presented first and thereafter data on adolescent or youth samples.

A US study which recruited 10 744 patients presenting with any complaint found that past-year assault by a non-partner was associated with male gender, EC presentation for an injury, and poor physical and mental health functioning as measured by the SF-12. Furthermore, alcohol, marijuana and cocaine use were also associated with non-partner violent assault (Cunningham et al., 2009a).

A case-control study in the US interviewed 2 395 injured patients, of which 102 were violently injured, and 89 community matched controls. The investigators found that drinking in the six hours prior to injury, past-month hazardous drinking and alcohol dependence predicted violence-related injury; yet alcohol abuse was not significantly associated with violence-related injury (Vinson et al., 2003).

A Mexican study recruited 127 victims of violence and used 920 community residents as the comparison group (Borges et al., 2004). Increased risk for violence-related injury was predicted by increased frequency and quantity of drinking, alcohol consumption in the six hours prior to the injury and alcohol dependence diagnosed with the alcohol dependence module of the CIDI. Depressive symptoms were associated with violence-related injuries in those patients who were drinkers.

Data from 436 violently and unintentionally injured patients seen in two Canadian ECs showed that patients admitting to alcohol use only in the six hours prior to injury were four times more likely to suffer a violence-related injury than an unintentional injury. Patients reporting alcohol and drug use prior to injury were 18 times more likely to be violently injured (Cherpitel et al., 2013).

Data from a US study which recruited violence-related injury and unintentional injury survivors, as well as a comparison group of elective surgery patients, identified a number of risk factors associated with both violence-related and

unintentional injury (Poole et al., 1997). Antisocial personality disorder, depression and mental retardation were associated with injury, along with younger age and lower income.

A Brazilian study reported above, which sampled female EC patients who had previous violent experiences during their lifetime, investigated the associations with above-threshold SRQ-20 scores in their sample (Silva and Aquino, 2008). Greater psychological distress scores were associated with recent violent experiences, psychological violence, and 'serious' forms of violence eg. strangulation or assault with a weapon. Women with children and those women who had suffered violence at the hands of an intimate partner had slightly increased psychological distress scores as compared to childless women and women who were victims of non-partner violence.

IPV has been widely investigated in EC populations and researchers have explored associations with presentation for these injuries, as well as factors associated with IPV histories. Examples of studies exploring these factors will be discussed below. One such study recruiting 610 African American patients found that the women who reported IPV experiences (20% of the study sample) were more likely to self-report depressive symptoms on the BDI, be socially isolated and admit to abusing different substances, including tobacco, alcohol and illicit drugs (Hankin et al., 2010). A further study with female African American EC patients (n=461) found that physical IPV was positively correlated with other types of IPV (i.e. sexual and emotional), depressive and PTSD symptoms, and suicidal thoughts (Houry et al., 2006).

Female patients from a US EC (n=321) were screened for IPV histories and questioned regarding their AOD use levels, physical health and mental health history (Roche et al., 2007). An IPV history was predicted by being separated or divorced,

having mental health problems, reporting current or previous alcohol misuse and the participant describing their mental health as 'fair' or 'poor'.

An Australian study found that 49.4% of their 358 female EC participants had experienced previous IPV (Roberts et al., 1998). Other data collected included alcohol use figures using the AUDIT and histories of childhood abuse using an unvalidated measure. Mental disorder diagnoses were also explored using the CIDI. IPV experiences were associated with diagnoses of depression, dysthymia, anxiety and phobias.

Another approach to factors associated with IPV in the literature, is the study of the link between physical injury patterns and the presence of IPV. A recent systematic review collected evidence from studies which recruited female patients presenting with injuries due to IPV, as well as recruiting control groups of non-IPV injured women (Wu et al., 2010). The authors concluded that unwitnessed head, neck or facial injuries should alert medical staff to the possibility of IPV victimisation.

Thus, in adult EC populations a great deal of evidence exists for the association of AOD use problems with violence-related injury (Cherpitel et al., 2013; Cunningham et al., 2003). Other significant factors, found include symptoms of various mental disorders (O'Donnell et al., 2009; Roberts et al., 1998). Similar factors have been investigated in youth samples, yet studies recruiting younger samples have tended to include factors such as violence exposure and risky behaviours such as weapon-carrying (Cunningham et al., 2011; Zun et al., 2005). Factors associated with violence-related injury in youth will be discussed below.

A study recruiting 188 patients aged 10-24 years old was conducted in Chicago, USA and investigated a variety of factors present in this population (Zun et al., 2005). Over 40% of the sample had witnessed someone being shot or killed, the majority of

the incidents having occurred in the participant's own neighbourhood. Of the group, 31% had witnessed other violent crimes such as physical or sexual assault, or muggings. The investigators then compared rates of certain factors present in their study population to the estimated rates for Chicago youth of the same age. They found that rates of marijuana use (75.5% vs 46.1%), school dropout (32.1% vs 15.5%), weapon carrying (46.8% vs 22.6%), previous arrests (69.1% vs 46.1%) and gang involvement (51.1% vs 14-30%) to be far more common in their group, than in the general population.

A further US study screened 1 128 adolescent EC patients aged 14 to 18 years old for a past-year injury and risky alcohol use and weapon-carrying (Cunningham et al., 2011). The AUDIT-C was used to measure alcohol use and the weapon-carrying items were taken from a youth risk behaviour survey. A past-year violence-related injury was reported by 38.1% of the adolescents and these injuries were predicted by male gender, binge drinking and weapon-carrying.

A later study from the same investigators recruited teens and young adults aged 14 to 24 years old who presented to the EC with a violence-related injury (Cunningham et al., 2014). The study sample of 1 448 patients was comprised of 718 patients presenting with a violence-related injury and 730 comparison group patients who presented for a non-assault related complaint. Presentation for care of a violence-related injury was associated with higher frequency of perpetration or victimisation with a weapon, school drop-out and higher levels of AOD misuse as measured by the AUDIT and the ASSIST. Furthermore, youth with violence-related injuries were more likely to have been seen for a previous violence-related injury and were more likely to have accessed EC care for mental health reasons.

Another US study recruited 147 adolescents with violence-related injuries aged 14 to 19 years old, as well as 133 unintentionally injured youth and 133 EC patients in

the same age group presenting for a non-injury complaint (Cheng et al., 2003). These investigators found that violence-related injury presentation was predicted by a higher frequency of fights in the preceding 12 months, previous weapon injuries and having witnessed a shooting.

In adolescent populations, AOD use problems also feature prominently as factors associated with violent injury. In contrast with adult populations, symptoms of other mental disorder have not often been investigated, but exposure to violence in the community and violence risk behaviours are commonly explored (Cheng et al., 2003; Zun et al., 2005).

At the present time, no studies investigating the prevalence of recurrent injury and associations with presentation for violent injury have been conducted in South African EC settings. **Chapter 4 will address this gap as well as objective two of this thesis.**

Given the high rates of mental disorders and their relationship with injuries, many have advocated that universal screening for AOD use problems and symptoms of other mental disorders should be conducted in healthcare contexts (Academic ED SBIRT Research Collaborative, 2007; Patel et al., 2008). Furthermore, since the extent of the burden of violent injury is not known, particularly in many LMICs, due to the lack of trauma registries for non-fatal injuries, many public health practitioners and organisations have highlighted the need for trauma surveillance (Krug et al., 2002; Mercy et al., 2003). The next section will outline approaches to mental disorder symptom screening and screening tools used in healthcare settings **This section will provide the background for objectives 3 and 4 of this thesis.**



2.6 Mental health screening

2.6.1 Overview of mental health screening

As discussed in Section 2.3, data from the World Mental Health Surveys reveal that between 12 and 47% of a country's population will suffer one or more mental disorders in their lifetime (Kessler et al., 2007), yet a substantial proportion of these people do not receive treatment (Kohn et al., 2004). This discrepancy is even larger in LMICs where between 76 and 85% of people with a serious mental disorder remain untreated, and often undiagnosed (Demyttenaere et al., 2004). It has been advocated that opportunistic screening for mental disorder, is a necessary part in addressing the treatment gap (Bower et al., 2006; Patel et al., 2008). With the scarcity of mental health resources in these countries (Kakuma et al., 2011), there is a need for tools to aid general medical staff and lay health workers in detecting mental disorders.

Screening for mental disorders and problem AOD use is beneficial for a number of reasons. First, screening for these problems may identify patients with less severe symptoms or problem AOD use (Reinholdz et al., 2013), possibly before the disorders become more serious and less amenable to intervention. Second, studies have found that screening alone may be the catalyst for some people to decrease their risky AOD use (Humeniuk et al., 2008b; Sorsdahl et al., unpublished data). Third, common mental disorders, such as depression and AOD problems are highly prevalent and there are effective treatment options available for these potentially debilitating conditions (Patel et al., 2007). Fourth, screening for common mental disorders, such as depression, has been found to be a cost-effective aspect of

addressing these conditions, leading the US Preventive Services Task Force to recommend that patients be screened for depression in healthcare settings provided that there are treatment options available in these facilities (US Preventive Services Task Force, 2002). Fifth, the detection of common mental disorders and problem AOD use through screening programmes in healthcare settings would be a vital first step in tackling the substantial mental health treatment gap in South Africa. Around 75% of the country's people who are living with a mental disorder do not receive treatment (Williams et al., 2008).

In recognition of the numerous benefits of screening, a number of mental health screening tools have been developed for clinical and research use. Some tools focus on specific disorders, such as the CES-D (Radloff, 1977). Screening for general psychological distress is the focus of another category of screeners, such as the K10 scale (Kessler et al., 2002). Other measures, such as the ASSIST (WHO ASSIST Working Group, 2002), only target the symptoms of risky AOD use. A few examples of each of the above-mentioned categories will be described below. First, a brief overview will be given of tools measuring a specific mental disorder, followed by an outline of screening tools for the broader category of psychological distress, with particular attention paid to the SRQ-20. Last, AOD use screening tools will be discussed and the ASSIST will be described in more detail.

2.6.1.1 Screening tools for specific mental disorders

Tools measuring symptoms of specific disorders have been developed for a range of conditions, including depression (Beck and Steer, 1993b), PTSD (Foa et al., 1997) and generalised anxiety disorder (Spitzer et al., 2006). These tools are useful for specific populations where high prevalence rates of a certain disorder are expected, for example, depression in a postnatal population (Almond, 2009), or PTSD screening in war veterans (Kang et al., 2003). Some examples of these tools will be discussed below.

A number of screening tools for depression have been developed and validated for use in healthcare settings (predominantly in HICs). Examples of these include the BDI (Beck and Steer, 1993b), the EPDS (Cox et al., 1987) and the PHQ-9 (Kroenke et al., 2001). One measure which has been validated in South Africa is the CES-D (Myer et al., 2008). This tool has been utilised frequently in various settings in South Africa, including ECs (Jones et al., 2011; Sorsdahl et al., unpublished data; Troeman et al., 2011). The CES-D measure was developed as an epidemiological tool for use in the general population and was not designed with the aim of eliciting diagnostic criteria. This 20-item measure was formulated to elicit symptoms from certain domains such as anhedonia or interpersonal challenges; although a number of different factor structures have been reported for the CES-D (Carleton et al., 2013). This tool has been validated in healthcare, and community settings, and has been found to be useful in these contexts (Breslau, 1985; Weissman et al., 1977).

Similarly, a number of screening tools have been developed for the detection of anxiety disorders. One group of anxiety disorder screeners interrogates non-specific anxiety symptoms (Beck and Steer, 1993a), while another group of tools measures symptoms of specific anxiety disorders (Spitzer et al., 2006). Tools measuring the non-specific symptoms of anxiety include the Geriatric Anxiety Inventory (Pachana et al., 2007), the Hamilton Anxiety Rating Scale (Bruss et al., 1994) and the Zung Self-Rating Anxiety Scale (Zung, 1971). One of the measures which has been utilised in South Africa is the Beck Anxiety Inventory (Beck and Steer, 1993a; Nel and Kagee, 2013; Sharp et al., 2014). This 21-item measure explores anxiety symptoms present in the past week and was designed for use in adult psychiatric settings but has been validated in other healthcare and community settings (Leentjens et al., 2011; Magan et al., 2008). As mentioned above, further screeners target specific anxiety disorders.

Examples of tools designed to identify people with specific anxiety disorders include the Social Anxiety Screening Questionnaire, (Sorsdahl et al., 2012b), the Generalized Anxiety Disorder 7-item (GAD-7) scale (Spitzer et al., 2006) and the Short OCD Screener (Uher et al., 2007). One of the most studied anxiety disorders is PTSD and many scales exist for PTSD screening in diverse populations. One such tool is the Posttraumatic Diagnostic Scale (PTDS) was developed with the aim of providing an indication of a PTSD diagnosis, as well as a measure of the severity of the PTSD symptoms, without the use of additional tools (Foa et al., 1997). This tool has utilised in South Africa (Steyn et al., 2013) and has been validated in a number of different settings (Dragan et al., 2012; Griesel et al., 2006). It was designed as a self-report tool for use in clinical and research settings in order to decrease the demand on clinicians' time. Previous tools which measured severity, such as the Clinician-Administered PTSD Scale (CAPS) (Blake et al., 1995), required clinician administration as implied by the name of this specific tool. The PTDS has been recommended particularly for trauma-exposed populations, and psychiatric and AOD abuse outpatient populations (Foa et al., 1997). The next section will outline tools utilised in screening for non-specific psychological distress.

2.6.1.2 Screening tools for psychological distress

In certain instances, tools screening for non-specific psychological distress are preferable to disorder-specific tools due to the fact that the nonspecific tools will also provide an indicator of the severity of the distress regardless of the actual diagnosis (Kessler et al., 2002). This attribute is beneficial in the primary care setting, especially in low-resource settings, where it may be necessary to allocate the limited resources to the most severely distressed individuals (Patel et al., 2008). Tools such as the K10 scale, the General Health Questionnaire and the SRQ-20 (Goldberg et al., 1997; Harding et al., 1980; Kessler et al., 2002) are designed to measure non-specific psychological distress.

The K-10, and the shorter K-6 measures, were developed as epidemiological tools, utilising modern psychometric approaches, for a large national survey in the US. A short format was used due to the limited space assigned to psychological distress screening in the surveys (Kessler et al., 2002). These tools have been validated in HIC and LMIC settings (Cornelius et al., 2013; Spies et al., 2009); although when compared to other screening scales in an LMIC, they performed less well than the other longer instruments (Patel et al., 2008).

The General Health Questionnaire 28 item (GHQ-28) and the GHQ-12 were designed for HIC settings and have both been validated in healthcare settings in a number of different countries (Goldberg et al., 1997). The GHQ was developed with four subscales, namely somatic symptoms, anxiety and insomnia, social dysfunction and severe depression. The GHQ has been validated in healthcare and community samples, including adolescent and maternal populations (Prady et al., 2013; Tait et al., 2002); although this tool has been criticised for being less precise in discriminating between individuals with and without a mental disorder (Furukawa et al., 2003). The screening tools for psychological distress outlined above were all developed for the HIC setting and relatively few tools have been designed for use in LMICs.

2.6.1.2.1 The SRQ-20 tool

Of the many screening tools available, the SRQ-20 is one of the few specifically designed for the LMIC primary care setting. This is particularly important as many screening tools are developed and tested in HICs, which are not necessarily culturally appropriate for LMICs. The SRQ-20 is a 20-item screening tool which was developed by the WHO and it has been widely used in LMICs. The short format and dichotomous (yes/no) answers employed in the SRQ-20 make it a promising tool for the busy primary care setting. For these reasons, the SRQ-20 was chosen for the EC study reported in this thesis.

A number of studies from the developing world have investigated the psychometric properties of the SRQ-20. For example, investigations in Brazil (Iacoponi and Jair de Jesus, 1989), China (Chen et al., 2009), Vietnam (Giang et al., 2006) and India (Patel et al., 2008) show that this tool is suitable for use in LMIC contexts. A measure of internal validity of the SRQ-20 in these settings ranged from 0.72 in Afghanistan (Ventevogel et al., 2007) to 0.88 in India (Patel et al., 2008) and the factor structure varied widely in different settings with between two and seven factors identified (Chen et al., 2009; Scholte et al., 2011; Ventevogel et al., 2007). Ideal cut-off points of this instrument for identifying cases of common mental disorder are dependent on the setting. For example, investigators have recommended a cut-off threshold of 7/8 rural Vietnamese women (Tuan et al., 2004) and, in India, cut-off points between 11/12 or 12/13 in India (Patel et al., 2008).

In South Africa, the SRQ-20 has been evaluated predominantly in community settings (Cherian et al., 1998; Rumble et al., 1996), and in two of the studies a gold standard diagnostic interview was not utilised (Bhagwanjee et al., 1998; Harding et al., 1980; Rumble et al., 1996). One small study conducted in an urban primary care clinic was epidemiological in nature and reported an optimal cut-off score for the population only but did not perform further analysis (Thom et al., 1993). The optimal cut-off score was determined using a pilot group of clinic patients prior to the start of the study. The optimal cut-off points in these studies, which included male and female participants, were identified as 6/7 and 7/8 (Bhagwanjee et al., 1998; Rumble et al., 1996; Thom et al., 1993). Only one study, conducted in rural schools reported factor analysis results of the SRQ-20 (Cherian et al., 1998). In this study, male and female grade 11 learners completed the SRQ-20 only and were not interviewed using a gold-standard measure. Thus, the SRQ-20 is a useful tool which has not yet been validated in South African EC settings. The next section will provide an overview of AOD screening tools.

2.6.1.3 Screening for AOD use

Another factor which has received a great deal of attention regarding screening in healthcare settings is AOD use (Jones, 2011; Mdege and Lang, 2011). AOD use screening has been advocated for and implemented in a number of different healthcare settings, including primary care, hospital wards and ECs (Browne et al., 2013; Mdege and Lang, 2011; Pilowsky and Wu, 2012). Certain groups of patients, such as adolescents (Pilowsky and Wu, 2013) and HIV-positive primary care patients (Chander, 2011) have been the focus of various screening initiatives.

A number of self-report AOD use screening tools have been developed, mainly for the primary healthcare setting. There are three broad categories of tools used. Firstly, there are general mental health screening instruments, such as the GHQ and the PHQ (Goldberg, 1978; Spitzer et al., 1999), which include items interrogating AOD use. Secondly, there are tools which screen for use of alcohol and illicit drugs, such as the ASSIST (WHO Assist Working Group, 2002), and third, those that aim to identify a certain substance or group of substances, such as the AUDIT (Saunders et al., 1993) and the DAST (Skinner, 1982). These instruments vary in length and purpose. Some tools are lengthy, up to 155 items, like the ASI (McLellan et al., 1980), and are more suited to research than healthcare settings, while others, such as the Paddington Alcohol Test (PAT) and the Fast Alcohol Screening Test (FAST) (Hodgson et al., 2002; Smith et al., 1996) are very brief and may detect at-risk patients in healthcare settings, but lose the risk categories identified by tools like the AUDIT (Saunders et al., 1993). Moreover, some tools, like the CAGE (Ewing, 1984) and the Michigan Alcoholism Screening Test (MAST) (Selzer, 1971), tend to more accurately identify those patients who are actually dependent than those drinking at lower but harmful levels (Babor and Kadden, 2005). Additionally, instruments such as the AUDIT and the ASSIST are designed to distinguish between patients using substances at different risk levels, ranging from low- to high-risk users (Saunders et al., 1993). While these tools are longer than the very brief tools, they have been

used successfully in healthcare settings (Reinert and Allen, 2007) and enable healthcare providers to tailor any intervention given according to the risk category of the patient.

2.6.1.3.1 The ASSIST tool

The ASSIST tool uses eight questions to interrogate the use of ten different substances and categorises patients into three risk categories: low, moderate and high risk. Information pertaining to frequency and quantity of use, as well as consequences of use is elicited (WHO ASSIST Working Group, 2002). The substances screened for include tobacco, alcohol, cannabis and methamphetamine. The ASSIST has been validated in healthcare settings in a number of countries, including the USA, Spain, India and Zimbabwe (Humeniuk et al., 2008a; Rubio Valladolid et al., 2014). In South Africa, the psychometric properties of the tool have not been explored; yet the ASSIST has been used successfully in South African primary care and emergency settings (Sorsdahl et al., unpublished data; Ward et al., 2008). Screening for mental disorder and problem AOD use is possible and feasible in many settings, **Chapters 5 and 6 will explore the psychometric properties of the SRQ-20 and the ASSIST for South African EC settings and will address objectives 2 and 3 of this thesis.**

The aim of screening healthcare populations for various factors such as problematic AOD use or mental disorders is to identify those individuals in need of treatment. For many of these disorders, brief interventions have been developed which are designed for delivery in a particular healthcare setting (Kaner et al., 2007; Zatzick et al., 2001). In some cases, certain interventions, such as the ASSIST-linked brief intervention, have been developed for use in conjunction with a specific tool (Humeniuk et al., 2008b). In the next section, a brief overview of interventions in primary care and EC settings will be provided, followed by an introduction to Cochrane systematic review methodology which will be used in **Chapter 7** for identifying promising interventions for preventing re-injury in patients presenting to

ECs with injuries due to interpersonal violence. This will function as a **brief background for objective 4.**



2.7 Interventions

The majority of healthcare interventions have been designed for primary care settings, with relatively few being developed for ECs. Additionally, the range of interventions developed is far broader in the primary care setting; the majority of EC interventions primarily target problematic AOD use. For this reason, a short synopsis of interventions found in primary care is presented.

2.7.1 Primary care interventions for AOD use, injury and mental disorders

A number of brief interventions have been designed and tested for the primary care setting targeting a range of disorders or problems. AOD use features prominently in this literature and a number of interventions have been tested, many of which are based on techniques such as motivational interviewing, cognitive behavioural therapy or psychoeducation (Humenuik et al., 2008b; Kaner et al., 2007; Patnode et al., 2014). Other problems targeted for brief interventions include depression (McNaughton, 2009; Patel, 2014), other mental disorders and psychological distress (Bower et al., 2011), and compliance and quality of life in people with chronic illnesses (Bryant et al., 2013; Smith et al., 2012). A further category of primary care interventions has focused on preventing injuries such as unintentional childhood injuries or injuries due to IPV (Bair-Merritt et al., 2014; Bass et al., 1993). A number of psychosocial interventions have been tested in ECs. Since, Chapter 7 of this thesis focuses only on EC interventions delivered to patients presenting with violence-

related injury which target outcomes such as re-injury and AOD use, a brief overview of other EC interventions will be provided below.

2.7.2 EC interventions for AOD use, injury and mental disorders

Within ECs, a few main outcomes have been the focus of various intervention efforts. These include AOD use, certain mental disorders, unintentional injuries and violence-related injuries. A number of studies have investigated brief interventions for AOD use in various EC populations including adolescents, injured patients and older patients (Cherpitel et al., 2009; Longabaugh et al., 2001; Monti et al., 1999; Newton et al., 2013). Other mental disorder symptoms which have been addressed in EC interventions include suicidality (Knox et al., 2012; Wei et al., 2013) and panic disorder symptoms (Dyckman et al., 1999; Marchand et al., 2012).

Interventions for injury prevention have also been developed for EC settings, targeting a range of injuries. Prevention efforts have targeted falls in older EC patients (Russell et al., 2010), seatbelt and bicycle helmet use (Fernandez et al., 2009; Johnston et al., 2002) and child car seat use in EC populations (Gittelman et al., 2006). EC interventions for violence prevention have focused on dating violence in youth (Cunningham et al., 2013), IPV in adults (Houry et al., 2011; Kendall, 2009) and peer violence (Cheng et al., 2008; Cunningham et al., 2012; Zun et al., 2006). Since violence-related injuries tend to recur (Sims et al., 1989), it is important to investigate the evidence for EC-based interventions for patients presenting with violence-related injuries.

2.7.3 Cochrane systematic review methodology for evaluating interventions

A recognised approach to reviewing the evidence for an intervention is by utilising the Cochrane Collaboration systematic review methodology. The overarching aim of the Collaboration is to inform evidence-based healthcare by reviewing and grading the evidence available in order to aid clinicians and healthcare policymakers in making evidence-based decisions.

Evidence-based healthcare is defined as:

“... the conscientious use of current best evidence in making decisions about the care of individual patients or the delivery of health services. Current best evidence is up-to-date information from relevant, valid research about the effects of different forms of health care, the potential for harm from exposure to particular agents, the accuracy of diagnostic tests, and the predictive power of prognostic factors.” (Cochrane, 1972)

The Cochrane Collaboration has attempted to standardise many aspects of the systematic review methodology and has applied stringent guidelines to this process in an attempt to minimise bias and ensure high-quality reviews. Since the Cochrane Collaboration was established in 1993, the guidelines and methodology have been utilised, evaluated and updated regularly. Within the Methodological Expectations of Cochrane Intervention Reviews (MECIR), 80 standards are listed to guide the systematic review process and 108 points outline standards for reporting systematic reviews (Higgins et al., 2012). Thus detailed methodology is available for each step of the systematic review process.

The elements of a systematic review can be summarised as follows (excerpt from the *Cochrane Handbook for Systematic Reviews of Interventions*):

- a clearly stated set of objectives with pre-defined eligibility criteria for studies;
- an explicit, reproducible methodology;
- a systematic search that attempts to identify all studies that would meet the eligibility criteria;
- an assessment of the validity of the findings of the included studies, for example through the assessment of risk of bias; and
- a systematic presentation, and synthesis, of the characteristics and findings of the included studies.

Some Cochrane systematic reviews include meta-analyses which provide statistical synthesis of the findings of the studies included in the review (Green et al., 2011). It is not always possible to conduct a meta-analysis and reasons include heterogeneity of study participants and methodologies, or when the available studies have high risks of bias. In these cases, the synthesis of results could be a meaningless exercise, and might provide misleading information (Deeks et al., 2011), thus a descriptive approach is preferred. In this manner, the current evidence for an intervention may be collated and interpreted according to the needs of the reader.

Interventions for preventing violence in school settings and for preventing alcohol-related injuries have been explored using Cochrane review methodology (<http://injuries.cochrane.org/injuries-group-reviews>), yet there had been no review conducted for preventing violence-related injuries in EC patients. **Chapter 7 of this thesis aims to address this gap and contains the systematic review conducted according to Cochrane methodology, in response to objective 4.**

2.8 Conclusion

The purpose of this chapter was to review the literature relating to the main research objectives derived in Chapter 1. The available evidence was presented and gaps were identified. Furthermore details of how the present thesis will attempt to fill these gaps were described. **The next chapter will address objective 1, and will explore the prevalence and predictors of mental disorder in injured South African EC patients.**

Chapter 3: Prevalence and predictors of mental disorders in an injured EC population

3.1 Chapter overview

In the previous chapter, the academic literature was reviewed as a background to the subsequent chapters. This chapter will present the background, method, results, discussion and conclusion of one aspect of a cross-sectional study conducted in two Cape Town ECs. As pointed out in Chapter 1, there is a scarcity of mental disorder prevalence data from LMIC ECs; moreover there has been very little investigation of the factors associated with mental disorder in these EC populations. This chapter aims to address this gap and objective one of this thesis. A brief background is provided below; a more comprehensive overview is supplied in Chapter 2.

3.2 Background

Investigating the prevalence of mental disorders and risk factors for these conditions amongst injured EC patients in LMICs is important for a number of reasons. First, studies from HICs suggest that injured patients presenting to ECs, especially those presenting with a violence-related injury, display high rates of mental disorders and problematic AOD use (Dicker et al., 2011; O'Donnell et al., 2009; Poole et al., 1997; Wan et al., 2006). The few studies that have looked at patients presenting to ECs in LMICs have focused solely on alcohol and drug use, with no studies investigating the prevalence of other mental disorders (Bowley et al., 2004; Cherpitel, 2007; Parry et al., 2005; Plüddemann et al., 2004). Second, EC patients in HICs are known to have high exposure rates to risk factors for mental disorders, mainly due to the fact that these risk factors have been investigated in these settings. These risk factors include past traumatic experiences and witnessing community violence (Cunningham et al., 2006). Although community violence and trauma variables in the EC have not been investigated in South Africa and other LMICs, the data indicate that there are high rates of trauma and community violence exposure in many of these countries, and these factors are significantly associated with mental disorders (Atwoli et al., 2013;

Ribeiro et al., 2013; Roberts et al., 2008; Shields et al., 2009; Uwakwe et al., 2012; Williams et al., 2007). Third, in LMICs such as South Africa there is a high burden of injuries, which makes a considerable contribution to the country's overall burden of disease (Norman et al., 2007b).

The aims of this component of the cross-sectional study were to provide mental disorder prevalence data for injured EC patients and interrogate various known risk factors, such as AOD use or past psychological trauma, as predictors of mental disorder diagnoses in these patients. Thus, this chapter begins to address the lack of research in this field in LMICs.

3.3 Methods

3.3.1 Study sites

This study was undertaken in two 24-hour ECs in Cape Town. The Elsies River and Khayelitsha sites were identified due to the burden of violent injuries in these urban, low socioeconomic areas (Naledi et al., 2009). Both of these facilities provide services for walk-in patients and refer to Tygerberg Hospital for specialised services if required.

3.3.2 Participants

A convenience sample of 200 participants was recruited from the ECs while they were seeking treatment for an injury due to violence or unintentional causes. Only those patients presenting with an injury were requested to participate in the study. Patients presenting with self-inflicted injuries were not included in the sample. Patients were excluded from the study if they were younger than 18 years of age, too unwell to participate, if they required referral to a higher level of care, or if they were unable to give informed consent. This was often due to the influence of alcohol and drug use, or medication prescribed for pain.

3.3.3 Procedure

During day, night and weekend shifts at the EC, patients were approached by health counsellors in the EC waiting areas after they had been triaged and once it was

ascertained that they were medically stable. The research staff did not have access to the EC log or clinical records. The triage process is a scoring system which enables medical staff to prioritise patients according to the severity of their injury or medical condition. The health counsellors involved in recruitment included the author of this thesis and research staff involved in an EC intervention study at the same time as this study was being conducted. They were completely separate from the usual medical staff. If they were amenable to being interviewed, the study, which was approved by the Human Research Ethics Committee of the University of Cape Town, was fully described in a confidential setting. If the patient agreed to participate, informed consent was taken and the survey was administered by the interviewer in the private area. The primary interviewer (the author of this thesis) is fluent in English and Afrikaans and conducted interviews in these two languages as necessary. If a participant could only understand Xhosa, a Xhosa-speaking study staff member was asked to translate.

If the participant was needed by the medical personnel, the study staff would temporarily suspend the interview and continue after the medical care had been completed. Participants requiring referral for mental health or social reasons were referred to the appropriate services. Participants requiring urgent attention were referred directly to the EC medical staff. On completion of the interview, participants were offered a R40 supermarket voucher in compensation for their time.

3.3.4 Measures

In addition to basic demographic information such as age, gender, race, relationship status, education and employment, the following measures (see Appendix 1) were included:

3.3.4.1 Mental disorders

The MINI (version 6.0) is a validated, structured clinician-administered diagnostic interview which is compatible with the international Classification of Diseases (ICD-10) and the DSM-IV (Sheehan et al., 1998). The MINI is widely used in clinical and research settings. This measure provides a mental disorder diagnosis for 12 month and lifetime prevalence of a mental disorder. The MINI consists of the following modules: major depressive disorder (current, past and recurrent), suicidality, manic episode (current and past), hypomanic episode (current and past), bipolar I and II disorders (current and past), bipolar disorder not otherwise specified (current and past), panic disorder (current and lifetime), agoraphobia (current), social phobia (current), obsessive-compulsive disorder (current), posttraumatic disorder (current), alcohol abuse and dependence (past 12 months), drug abuse and dependence (past 12 months), psychotic disorders (current and lifetime), mood disorders with psychotic features (current and lifetime), anorexia nervosa (current), bulimia nervosa (current), generalised anxiety disorder (current) and antisocial personality disorder (lifetime).

An example of the screening section and a further question in the Major Depressive Episode module is presented below:

A. MAJOR DEPRESSIVE EPISODE

(➡ MEANS : GO TO THE DIAGNOSTIC BOXES, CIRCLE NO IN ALL DIAGNOSTIC BOXES, AND MOVE TO THE NEXT MODULE)

A1	a	Were you <u>ever</u> depressed or down, most of the day, nearly every day, for two weeks?	NO	YES
		IF NO, CODE NO TO A1b. IF YES ASK:		
	b	<u>For the past two weeks</u> , were you depressed or down, most of the day, nearly every day?	NO	YES
A2	a	Were you <u>ever</u> much less interested in most things or much less able to enjoy the things you used to enjoy most of the time, for two weeks?	NO	YES
		IF NO, CODE NO TO A2b. IF YES ASK:		
	b	In the <u>past two weeks</u> , were you much less interested in most things or much less able to enjoy the things you used to enjoy, most of the time?	NO	YES
		IS A1a OR A2a CODED YES?	NO	YES

A3 IF A1b OR A2b = YES: EXPLORE THE CURRENT AND THE MOST SYMPTOMATIC PAST EPISODE, OTHERWISE
IF A1b AND A2b = NO: EXPLORE ONLY THE MOST SYMPTOMATIC PAST EPISODE

Over that two week period, when you felt depressed or uninterested:

	<u>Past 2 Weeks</u>		<u>Past Episode</u>	
	NO	YES	NO	YES
a	Was your appetite decreased or increased nearly every day? Did your weight decrease or increase without trying intentionally (i.e., by $\pm 5\%$ of body weight or ± 8 lbs. or ± 3.5 kgs., for a 160 lb./70 kg. person in a month)?			
	IF YES TO EITHER, CODE YES.			

3.3.4.2 Injury

Injury intent (intentional or unintentional) and the number of previous violence-related injuries for which the participant accessed medical care were documented. One of the participant groups in this study had sustained a violence-related (intentional injury), while participants in the other group presented with an unintentional injury.

3.3.4.3 Traumatic stressors

The Trauma History Questionnaire (THQ): The THQ is a validated 26-item measure which interrogates various subgroups of trauma over the lifetime of a subject, including: crime-related trauma, general disasters and traumatic experiences and

trauma due to sexual experiences (Hooper et al., 2011). The frequency of any trauma was calculated to give an indication of the trauma burden, and categorised as 0 traumas, 1-10 traumas, 11-20 traumas and > 20 traumas.

3.3.4.4 Community violence

Witnessed community violence was measured using the witnessing module of the Survey of Exposure to Community Violence (SECV) (Richters & Saltzman, 1990). The answers for this 11-item questionnaire were documented as yes or no. The 'yes' answers were summed to provide a score.

3.3.5 Sample size determination

The sample size determination was conducted on the basis of an estimated mental disorder prevalence of 20%. The calculations utilised 2-sided tests at $\alpha = 0.05$ and $\beta = 0.1$ i.e. 90% power. A sample of 186 produces a two-sided 95% confidence interval with a width equal to 0.12 when the sample proportion is 0.200. To account for attrition the sample size was increased to 200. Unpublished data investigating the re-injury prevalence amongst patients presenting to the ECs where the study took place, reveal that 5% report a re-injury in the preceding three months (Sorsdahl et al., unpublished data). The sample size of 200 is sufficient to investigate the prevalence of re-injury.

3.3.6 Data analysis

Data were analysed using IBM SPSS Statistics version 20. Means and proportions were compared using t-tests and chi-square tests as appropriate. The unadjusted associations between having a mental disorder on demographic, injury and trauma variables as independent variables were examined. Statistical significance was based on 2-sided tests and set at $\alpha = 0.05$. Additionally, 3 logistic regression models were developed to predict 1) any current mental disorder including AOD use disorders, 2) AOD use disorders and 3) AOD use disorder with another mental disorder. The results of the regression models were reported as odds ratios (ORs) with 95% confidence intervals (CIs).

3.4 Results

3.4.1 Characteristics of the study participants

Two hundred participants were recruited for the study. The sociodemographic, trauma and injury characteristics of the participants are presented in Table 3.1, along with a breakdown of those with or without a mental disorder. The majority of the sample were male (67%), between the ages of 25-40 years old and did not complete high school (67.5%). High frequencies of previous violence-related injuries (up to 12 injuries), witnessed community violence exposure and lifetime traumatic experiences were documented in this sample. On average participants had experienced six of the eleven community violence events and over 40% of the sample had been exposed to more than ten lifetime traumatic experiences.

Table 3.1 Demographic, injury and trauma characteristics of the sample

	Total sample (N, %)	Meet DSM-IV Criteria (n=126) (N, %)	Do not meet criteria (n=74) (N, %)	p-value
Age				
18-25	60 (30)	41 (32.5)	19 (25.7)	0.34
25-40	86 (43)	55 (43.7)	31 (41.9)	
>40	54 (27)	30 (23.8)	24 (32.4)	
Gender				
Male	134 (67)	87 (69.0)	47 (63.5)	0.42
Female	66 (33)	39 (31.0)	27 (36.5)	
Race				
Black	105 (53)	65 (52.0)	40 (54.1)	0.88
Coloured	92 (46.2)	59 (47.2)	33 (44.6)	
Other	2 (1.0)	1 (0.80)	1 (1.4)	
Relationship status				
Alone	105 (53)	69 (54.8)	36 (50.0)	0.52
In a relationship	93 (47)	57 (45.2)	36 (50.0)	
Completed high school				
Yes	65 (32.5)	39 (31.0)	26 (35.1)	0.55
No	135 (67.5)	87 (69.0)	48 (64.9)	
Employed				
Yes	104 (52.0)	56 (44.4)	48 (64.9)	0.05
No	96 (48.0)	70 (55.6)	26 (35.1)	
Injury presentation				
Unintentional	82 (41.0)	44 (34.9)	38 (51.4)	0.02*
Violence-related	118 (59.0)	82 (65.1)	36 (48.6)	
# Previous intent injuries (med, range)	0, 12	1, 12	0,4	<0.01*
Community violence (mean, sd)	5.9, 3	6.47, 2.71	4.94, 3.19	<0.01*
Lifetime traumas (THQ)				
0	29 (14.5)	16 (12.7)	13 (17.6)	<0.01*
1 to 10	88 (44.0)	47 (37.3)	41 (55.4)	
11 to 20	41 (20.5)	28 (22.2)	13 (17.6)	
> 20	42 (21)	35 (27.8)	7 (9.5)	

*p<0.05

3.4.2 The prevalence of mental disorders

This sample displayed a high prevalence of mental disorders (see Table 3.2 below) with 59.5% suffering from a current mental disorder and 63% of participants meeting criteria for a lifetime mental disorder. Participants with a mental disorder were more likely to be unemployed ($p=0.05$), present with a violence-related injury and not an unintentional injury ($p=0.02$), have experienced a higher frequency of previous violence-related injuries ($p<0.01$), have witnessed more community violence ($p<0.01$) and have a higher occurrence of lifetime traumatic experiences ($p<0.07$) than those without a mental disorder. The most frequently reported mental disorders in the sample were major depression (24.5%) and AOD use disorders (43%). Of the total sample, 59% of participants presented with common mental disorders which could easily be identified in a primary care setting namely: AOD use, current depression, an anxiety disorder or suicidality.

Table 3.2 Prevalence of mental disorders in an injured EC population

	Total sample		Unintentional injuries		Violence-related injuries		p-value
	N	%	N	%	N	%	
All mental disorders	126	63	44	53.7	82	69.5	0.02*
Current mental disorders (12-month)	119	59.5	40	48.8	79	66.9	0.01*
Current mental disorder alone (no AOD)	33	16.5	13	15.9	20	16.9	0.84
Any AOD dependence/abuse	86	43	27	32.9	59	50	0.02*
AOD alone	38	19	18	22	20	16.9	0.38
AOD & another current mental disorder	37	18.5	9	11	28	23.7	0.02*
AOD & any lifetime mental disorder	48	24	9	11	39	33.1	<0.01*
Any MDE	49	24.5	16	19.5	33	28	0.17
Any manic or hypomanic	6	3	4	4.9	2	1.7	0.19
Any anxiety disorder	32	16	8	9.8	24	20.3	0.05
PTSD	13	6.5	4	4.9	9	7.6	0.44
Any panic, agoraphobia, gen anxiety	23	11.5	5	6.1	18	15.3	0.05
Any psychosis	12	6	5	6.1	7	5.9	0.96

*p<0.05

- AOD = alcohol or drug abuse/dependence; MDE = major depressive episode; PTSD = post-traumatic stress disorder
- Any MDE included the following MINI modules: current, past and recurrent major depression
- Any manic or hypomanic included: current/past manic episode and current/past hypomanic episode
- Any anxiety disorder included: lifetime/current panic disorder, lifetime limited panic symptoms, current agoraphobia, social phobia, current obsessive-compulsive disorder, current post-traumatic stress disorder, current generalised anxiety disorder
- Any psychosis included: lifetime/current mood disorder with psychotic features and lifetime/current psychotic disorder

3.4.3 Predictors of mental disorder

The prevalence of current mental disorders was higher in those presenting with a violence-related injury than in those with an unintentional injury (66.9% vs 48.8%, $p=0.01$). More specifically, the prevalence of disorders such as major depression (19.5% vs 28%, $p=0.17$), any anxiety disorder (9.8% vs 20.3%, $p=0.05$) and AOD use disorders (32.9% vs 50%, $p=0.02$) was higher in the violence-related injury group. Individuals meeting criteria for both an AOD use disorder and another mental disorder were more likely to present with a violence-related injury (33.1% vs 11%, $p<0.01$).

Investigations into the unadjusted and adjusted effects of participant demographic, injury and trauma characteristics on any current mental disorder are presented in Table 3.3. After adjusting for the effects of the other variables in the model, unemployment (OR=0.53, 95% CI 0.28-1) and a high frequency of previous violence-related injuries was significantly associated with the diagnosis of any current mental disorder (OR = 1.46, 95% CI 1.08-1.98).

In the final adjusted regression model predicting AOD use disorder, participants were more likely to be male (OR=0.25, 95% CI 0.11-0.55) and have witnessed high levels of community violence (OR=1.19, 95% CI 1.04-1.36). (See Table 3.4.)

Table 3.3 Logistic regression results for demographic, injury and trauma correlates of any current mental disorder† (n=200)

Variable	Any current mental disorder		
	Yes (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age			
18-25	38 (31.9)	1.00	1.00
25-40	51 (42.9)	0.84 (0.43-1.66)	0.72 (0.34-1.54)
>40	30 (25.2)	0.72 (0.34-1.53)	0.67 (0.3-1.51)
Gender			
Male	82 (68.9)	1.00	1.00
Female	37 (31.1)	0.81 (0.45-1.47)	1.04 (0.52-2.08)
Race			
Black	59 (50)	1.00	Not included
Coloured	58 (49.2)	1.33 (0.75-2.36)	
Other	1 (0.8)	0.78 (0.05-12.8)	
Relationship status			
Alone	66 (55.5)	1.00	Not included
In a relationship	53 (44.5)	0.78 (0.44-1.39)	
Completed high school			
No	85 (71.4)	1.00	Not included
Yes	34 (28.6)	0.65 (0.35-1.18)	
Employed			
No	67 (56.3)	1.00	1.00
Yes	52 (43.7)	0.43 (0.24-0.77)*	0.53 (0.28-1)*
Injury presentation			
Unintentional	40 (33.3)	1.00	1.00
Violence-related	79 (66.4)	2.13 (1.19-3.79)*	1.28 (0.65-2.54)
# Previous violence-related injuries (med, range)	1, 12	1.57 (1.19-2.07)*	1.46 (1.08-1.98)*
Community violence (m, sd)	6.4, 2.7	1.16 (1.04-1.28)	Not included
Lifetime trauma (THQ)			
0	15 (12.6)	1.00	1.00
1 to 10	44 (37)	0.93 (0.4-2.16)	0.95 (0.38-2.35)
11 to 20	28 (23.5)	2.01 (0.75-5.36)	1.67 (0.59-4.71)
> 20	32 (26.9)	2.99 (0.08-8.26)*	1.66 (0.54-5.08)

* p<0.05

† any current mental disorders includes AOD use disorder

Table 3.4 Logistic regression results for demographic, injury and trauma correlates of AOD use disorders† (n=200)

Variable	Any AOD		
	Yes (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age			
18-25	31 (36)	1.00	1.00
25-40	35 (40.7)	0.64 (0.33-1.25)	0.54 (0.23-1.28)
>40	20 (23.3)	0.55 (0.26-1.16)	0.42 (0.16-1.08)
Gender			
Male	72 (83.7)	1.00	1.00
Female	14 (16.3)	0.23 (0.12-0.46)*	0.25 (0.11-0.55)*
Race			
Black	43 (50)	1.00	Not included
Coloured	43 (50)	1.27 (0.72-2.23)	
Other	0	0	
Relationship status			
Alone	48 (55.8)	1.00	Not included
In a relationship	38 (44.2)	0.82 (0.47-1.44)	
Completed high school			
No	62 (72.1)	1.00	Not included
Yes	24 (27.9)	0.69 (0.38-1.27)	
Employed			
No	48 (55.8)	1.00	Not included
Yes	38 (44.2)	0.58 (0.33-1.01)	
Injury presentation			
Unintentional	27 (31.4)	1.00	1.00
Violence-related	59 (68.6)	2.04 (1.14-3.66)*	0.78 (0.35-1.74)
# Previous violent injuries (md, r)	1, 12	1.20 (1.01-1.41)*	1.18 (0.95-1.46)
Community violence (mean, SD)	6.9, 2.6	1.25 (1.11-1.4)*	1.19 (1.04-1.36)*
Lifetime trauma (THQ)			
0	12 (14)	1.00	Not included
1 to 10	27 (31.4)	0.63 (0.26-1.49)	
11 to 20	22 (25.6)	1.64 (0.63-4.29)	
> 20	25 (29.1)	2.08 (0.8-5.45)	

* p<0.05

† AOD use disorders includes AOD use disorders alone as well as those occurring with another mental disorder

Similarly, participants who met criteria for both an AOD use disorder and another mental disorder were more likely to have witnessed high levels of community violence (OR=1.25, CI 1.03-1.53) than those without these disorders. (See Table 3.5.)

Table 3.5 Logistic regression results for demographic, injury and trauma correlates of the comorbidities of AOD use disorders with another mental disorder (n=200)

Variable	AOD and current mental disorder		
	Yes (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age			
18-25	12 (32.4)	1.00	1.00
25-40	15 (40.5)	0.85 (0.36-1.96)	0.59 (0.21-1.64)
>40	10 (27)	0.91 (0.36-2.31)	1.05 (0.33-3.36)
Gender			
Male	28 (75.7)	1.00	1.00
Female	9 (24.3)	0.59 (0.26-1.35)	0.71 (0.26-1.93)
Race			
Black	14 (37.8)	1.00	1.00
Coloured	23 (62.2)	2.17 (1.04-4.52)*	1.43 (0.52-3.92)
Relationship status			
Alone	19 (51.4)	1.00	Not included
In a relationship	18 (48.6)	1.09 (0.53-2.22)	
Completed high school			
No	26 (70.3)	1.00	Not included
Yes	11 (29.7)	0.85 (0.39-1.86)	
Employed			
No	24 (64.9)	1.00	1.00
Yes	13 (35.1)	0.43 (0.2-0.9)*	0.53 (0.22-1.26)
Injury presentation			
Unintentional	9 (24.3)	1.00	1.00
Violence-related	28 (75.7)	2.52 (1.12-5.68)*	1.46 (0.52-1.05)
# Previous violent injuries (med, range)	1, 12	1.054 (0.89-1.25)	Not included
Community violence (mean, SD)	6.4, 2.2	1.35 (1.14-1.59)*	1.27 (1.04-1.55)*
Lifetime trauma (THQ) (med, range)	22, 44	1.04 (1.01-1.07)*	1.02 (0.99-1.05)

* p<0.05

3.5 Discussion

This study resulted in a number of important findings in an injured LMIC EC population. Firstly, there was a high prevalence of mental disorders among injured patients presenting to ECs. Secondly, AOD use disorders and major depression were the most frequently reported mental disorders. Third, individuals presenting with a violence-related injury were more likely to meet criteria for a mental disorder, particularly AOD use disorders, than those presenting with an unintentional injury. Fourth, diagnosis of any mental disorder was associated with unemployment and a high frequency of previous violence-related injuries, while any AOD use disorder was associated with male gender and high levels of witnessed community violence.

The present study found a high prevalence of mental disorders among patients presenting to the EC with an injury. This finding is consistent with the international literature (Dicker et al., 2011; O'Donnell et al., 2009; Wan et al., 2006), where some studies found that prevalence rates of mental disorder in injured populations were twice those documented in the general population (Dicker et al., 2011; Herman et al., 2009). For example, an Australian EC study found a high mental disorder lifetime prevalence rate of 63% in their sample of injured patients (O'Donnell et al., 2009). The finding of a lifetime prevalence rate of 63% matched these results, confirming that the injured population in this study is an at-risk group for mental disorder.

The most prevalent disorders found in the sample were AOD use disorders (43%) and major depression (24.5%). It is not surprising that AOD use disorders were the most frequently reported mental disorders amongst this population given its strong association with injury and the high prevalence of AOD use disorders reported in South Africa (Herman et al., 2009). This finding is consistent with data from HICs where AOD use disorders are also particularly prevalent in participants with violence-related injuries (Dicker et al., 2011; O'Donnell et al., 2009; Poole et al., 1997; Wan et al., 2006). In these studies, the prevalence of alcohol abuse ranged

from 10 to 53%, while alcohol dependence rates were between 18 and 37%. Similarly, the study found an alcohol dependence prevalence of 24%, and a further 10% of participants were found to be abusing alcohol. Furthermore, the finding of major depressive disorder in 24% of the sample is consistent with studies from HICs which have found the prevalence of major depression or depressive symptoms in injured populations to range from 18% to 46.7% (Dicker et al., 2011; O'Donnell et al., 2009; Poole et al., 1997; Ranney et al., 2011).

In the present study, patients in the violence-related injury group were significantly more likely to meet criteria for a current mental disorder compared to the unintentional injury group (66.9% vs 48.8%). A number of studies conducted in HICs have reported similar findings with higher rates of mental disorders in patients with violence-related injuries compared to patients with unintentional injuries (O'Donnell et al., 2009; Whetsell et al., 1989). In the literature, 20-63% of individuals admitted with an unintentional injury were found to have a mental disorder (Dicker et al., 2011; O'Donnell et al., 2009; Poole et al., 1997; Wan et al., 2006), while 63-78% of patients either seen in the EC or admitted to hospital with violence-related injuries were diagnosed with one or more mental disorder (O'Donnell et al., 2009; Poole et al., 1997; Saliou et al., 2005). The prevalence of 53.7% in the unintentionally injured group and 69.5% in the violence-related injury group is very similar to the above data, suggesting that the picture in LMICs could be similar to that in HICs.

In the sample, in addition to unemployment, a current mental disorder was significantly predicted by higher frequencies of previous violence-related injuries. Given the association between mental disorders and injuries due to violence this is not unexpected. Evidence from previous research suggests that mental disorders are associated with violence-related injury in several ways. Firstly, these two sets of conditions have been shown to share risk factors or associations, such as income levels and alcohol use (Lopez et al., 2006; Lund et al., 2010; Rehm et al., 2009).

Secondly, injuries have been implicated as a precipitating factor in various mental disorders such as PTSD and depression (Bryant et al., 2010; Holbrook et al., 1999). Thirdly, mental disorders such as AOD abuse and psychotic disorders have been shown to place sufferers at risk of injury (McGinty et al., 2012; Poole et al., 1997). Previous research has documented the high prevalence of mental disorder in patients presenting with a violence-related injury (O'Donnell et al., 2009; Whetsell et al., 1989), yet this study is the first to present the association between exposure to high frequencies of violence-related injuries and a mental disorder diagnosis.

Furthermore, high frequencies of witnessed community violence significantly predicted AOD use disorders as well as an AOD use disorder diagnosis in conjunction with another mental disorder. High frequencies of witnessed community violence are known to be present in injured EC populations (Cheng et al., 2003; O'Donnell et al., 2009) and violence within communities is a common occurrence in the South African setting. Data from SASH found that a high proportion of respondents had witnessed such violence (Atwoli et al., 2013). Additionally, this variable is a known risk factor for mental disorder in other populations (Atwoli et al., 2013; Goldmann et al., 2011; Green et al., 2010). Having witnessed community violence is known to be associated with AOD use in adolescent community samples; yet this has not been widely explored in adult populations (Aisenberg & Herrenkohl, 2008; Zinzow et al., 2009). These findings are the first to present data on predictors of mental disorder in a moderately injured adult population presenting to an EC. These data could be utilised in the future for planning EC-based interventions for those injured patients who are seen and discharged within a few hours of arriving at the EC.

Several limitations of this study must be considered when interpreting these findings. First, because of convenience sampling and the small sample size, the results may not be generalisable to the South African population. The study staff did not have access to the EC patient logs for recruitment purposes or for capturing data

on patients not recruited for the study; therefore it was impossible to ascertain what proportion of the injured patient population was accessed for the study. Furthermore, the female group was very small, limiting the generalisability of the findings to female patients and limiting the ability to comment confidently on gender differences. Second, data on past injury was self-reported. Unfortunately, South Africa does not currently have an injury surveillance system making it impossible to retrieve information regarding previous injury presentations. Third, patients with severe AOD intoxication were not included, so estimates of the prevalence of AOD use disorders here may be conservative. Fourth, interviewing patients directly after an injury experience may influence their recall and cloud their perception of past events and their mental health symptoms. Lastly, the PTSD module of the MINI was not administered in conjunction with the THQ, but relied on the MINI screening question. This could have resulted in under-reporting of PTSD in this study.

3.6 Conclusion

Despite these limitations, the findings of this study have a number of implications for practice in ECs, and for formulation of health policy and community interventions, in LMICs such as South Africa. As in HIC studies, the high prevalence rates of mental disorders in this population indicate that injured EC patients, especially patients with violence-related injuries, in South Africa should be the focus of targeted screening for mental disorders. Many LMIC ECs, including those in South Africa, do not offer routine mental health screening or brief interventions to their patients. Although the South African Mental Health Policy Framework and Strategic Plan 2013-2020 mentions screening and brief interventions for mental disorders, the only population specifically mentioned is the antenatal population, and the EC context is not recognised as an intervention site. (See section 8.3.4.1.) This study emphasises the need for such interventions in LMICs. Screening, early detection of, and intervention for common mental disorders and their modifiable risk factors

could make an important contribution to decreasing the treatment gap for mental disorders in LMICs and reducing recurrent injuries in EC populations. The range of predictors for mental disorder in the study highlights the need for hospital-based as well as community interventions. Psychosocial interventions in the EC context, in conjunction with interventions in other contexts, can potentially make an important contribution to reducing the burden of disease in LMICs.

Chapter 4: Recurrent violence-related injury and predictors of violence-related injury presentation

4.1 Chapter overview

In the previous chapter data regarding the prevalence and predictors of mental disorders in EC patients were presented. This chapter will present the background, method, results, discussion and conclusion of another aspect of the cross-sectional study conducted in two Cape Town ECs. As pointed out in Chapter 1, there is a scarcity of recurrent injury prevalence data from LMIC ECs; moreover there has been very little investigation of the factors associated with violence-related injury presentation in these EC populations. This chapter aims to address this gap and objective two of this thesis. A brief background is provided below; a more comprehensive overview is supplied in Chapter 2.

4.2 Background

Injuries make a substantial contribution to the global burden of disease, especially in LMICs (World Health Organization, 2008), and in a small number of LMICs, such as South Africa and Colombia, injuries due to interpersonal violence are the leading cause of injury DALYs (Institute for Health Metrics and Evaluation; Norman et al., 2007b). In South Africa, the age-standardised homicide rate is seven times higher than the global average at 64.8 per 100 000 population and even higher than the 60 per 100 000 figure reported for Columbia. The majority of these victims are male: the homicide rate for young males aged 15 to 29 years is nine times the global rate at 184 per 100 000 (Norman et al., 2007b). Similarly, 42% of young South Africans aged 12 to 22 years old reported being a victim of crime or violence over a 12 month period as measured by the National Youth Victimization Survey, with boys being victimised more often than their female counterparts (Leoschut et al., 2006). Furthermore, the National Victims of Crime Study conducted in South Africa found that 23% of South African adults had experienced crime or violence victimisation over a 12 month period (Burton et al., 2004). IPV is also prevalent in the country

with an estimated prevalence of 18.4% among women over 15 years old (Norman et al., 2010) and a reported intimate partner femicide rate of 8.8 per 100 000 which is the highest reported rate globally (Abrahams et al., 2009). South African healthcare data regarding injuries is scarce, however the available data reveals a similar picture. High numbers of violence victims are seen in the healthcare system and 70% of these victims are male (Mureithi et al., 2013).

Hospital-based data from HICs reveal that injury, and in particular injury due to interpersonal violence, is a recurring phenomenon (Brooke et al., 2006; Sims et al., 1989). Along with the documented high injury recurrence rate, investigations into the risk factors for violence-related injuries in hospital settings have mainly emerged from inpatient settings in HICs. These studies have revealed a range of risk factors for presenting to EC services, including male gender, low socioeconomic circumstances, high frequencies of mental disorder, AOD use, past psychological trauma and community violence exposure (Cunningham et al., 2006; O'Donnell et al., 2009). In LMICs, factors which have been explored in association with violence-related injury are limited to demographic factors, clinical injury patterns, injury scenario factors (such as time and location), and AOD use (Parry et al., 2005; Ranney et al., 2009). There is very little data regarding the prevalence of recurrent violence-related injuries and the predictors of presentation for violence-related injury in LMICs.

This chapter investigates the prevalence of recurrent violence-related injury in an injured EC population. Additionally, the predictors of presentation for violence-related injury, previous violence-related injury and recurrent violence-related injury are explored in order to highlight factors that could be amenable to intervention in the LMIC EC setting.

4.3 Methods

Information regarding study sites, participants, procedures and sample size determination are found in sections 3.3.1-3.3.3 and 3.3.5. The measures and analysis methods utilised for this aspect of the EC study are described below.

4.3.1 Measures

In addition to a number of sociodemographic variables, such as age, gender, race, relationship status, education and employment, the following measures (see Appendix 1) were included:

4.3.1.1 Mental health status

The MINI is a validated, structured clinician-administered diagnostic interview which is compatible with the international Classification of Diseases (ICD-10) and the DSM-IV (Sheehan et al., 1998). The MINI is widely used in clinical and research settings. This measure provided a mental disorder diagnosis for 12 month and lifetime prevalence of a mental disorder. The MINI consists of the following modules: major depressive disorder (current, past and recurrent), suicidality, manic episode (current and past), hypomanic episode (current and past), bipolar I and II disorders (current and past), bipolar disorder not otherwise specified (current and past), panic disorder (current and lifetime), agoraphobia (current), social phobia (current), obsessive-compulsive disorder (current), posttraumatic disorder (current), alcohol abuse and dependence (past 12 months), drug abuse and dependence (past 12 months), psychotic disorders (current and lifetime), mood disorders with psychotic features (current and lifetime), anorexia nervosa (current), bulimia nervosa (current), generalised anxiety disorder (current) and antisocial personality disorder (lifetime).

4.3.1.2 Injury

Injury intent (violence-related or unintentional) and the number of previous violence-related injuries were documented. The phrase 'previous violence-related injuries' refers to any violence-related injury occurring prior to the injury for which the patient presented to the EC and was interviewed for this study. This data was

captured in order to reveal the amount of previous exposure to violence-related injuries over the participant's lifetime. Participants who presented with an unintentional injury during the study period may have had past experiences of violence-related injuries. Recurrent violence-related injuries within the preceding five years were recorded. For the purposes of this study, a recurrent violence-related injury was defined as more than one violence-related injury within the previous five years. Thus a person who presented with a violence-related injury during the study period would need only one previous such injury within the preceding five years to be identified as having suffered recurrent injuries. A person presenting with an unintentional injury would have needed at least two previous violence-related injuries within the preceding five years to be identified as having suffered recurrent violence-related injuries. One of the participant groups in this study constituted victims of interpersonal violence, and the other group contained participants who had sustained unintentional injuries. The unintentional injuries recorded were those that had resulted from an unplanned incident, such as a road traffic crash, a fall or a fire.

4.3.1.3 Traumatic life events

4.3.1.3.1 The Trauma History Questionnaire (THQ)

The THQ is a validated measure which interrogates various subgroups of stressful events over the lifetime of a subject, including: crime-related trauma, general disasters and traumatic experiences and trauma due to sexual experiences (Hooper et al., 2011). The frequency of any trauma was calculated to give an indication of the trauma burden and utilised as a continuous variable. Participants' violence-related injury experiences were excluded for the analyses.

4.3.1.3.2 Community violence

Witnessed community violence was measured using the witnessing module of the SECV (Richters and Saltzman, 1990). The answers for this 11-item questionnaire were documented as yes or no. The 'yes' answers were summed to provide a score.

4.3.5 Data analysis

Data were analysed using IBM SPSS Statistics version 20. Means and medians were compared using t-tests and Wilcoxon rank sum tests as appropriate. Proportions were compared using Chi-squared tests or Fischers' exact test as appropriate. The unadjusted associations between violence-related or unintentional injury presentation on demographic, injury and trauma variables as independent variables were examined. Additionally, 3 logistic regression models, using data from the entire sample (i.e. n=200), were developed to predict recurrent violence-related injury in the previous five years, violence-related injury presentation and previous violence-related injury history. Statistical significance was based on 2-sided tests and set at alpha= 0.05. The results of the regression models were reported as odds ratios (ORs) with 95% confidence intervals (CIs).

4.4 Results

4.4.1 Characteristics of the study participants

The sociodemographic, trauma and injury characteristics of the 200 participants are presented in Table 4.1, along with a breakdown of those presenting with a violence-related or unintentional injury. The majority of the sample were male, between the ages of 25-40 years of age and did not complete high school. Many participants reported experiencing more than one violence-related injury within the previous five years. High frequencies of witnessed community violence exposure and lifetime traumatic experiences were documented in this sample. Unadjusted associations reveal that those presenting with a violence-related injury were significantly more likely than those in unintentional injury group to be in the 25 to 40 year old age category, male, unemployed and have experienced a previous violence-related injury. Furthermore, this group of participants were also significantly more likely to be diagnosed with a current mental disorder or an AOD use disorder and were exposed to higher frequencies of witnessed community violence and lifetime traumatic experiences.

Table 4.1 Demographic, injury and trauma characteristics of the sample

	Total sample	Violence-related injury	Unintentional injury	p-value
	n=200 (%)	n=118 (%)	n=82 (%)	
Age				
18-25	60 (30)	40 (33.9)	20 (24.4)	0.04*
25-40	86 (43)	54 (45.8)	32 (39.0)	
>40	54 (27)	24 (20.3)	30 (36.6)	
Gender				
Male	134 (67)	92 (78.0)	42 (51.2)	<0.01*
Female	66 (33)	26 (22.0)	40 (48.8)	
Race				
Black	105 (53)	62 (52.5)	43 (53.1)	0.96
Coloured	92 (46.2)	55 (46.6)	37 (45.7)	
Other	2 (1)	1 (0.8)	1 (1.2)	
Relationship status				
Alone	105 (53)	65 (55.6)	40 (49.4)	0.39
In a relationship	93 (47)	52 (44.4)	41 (50.6)	
Completed high school				
Yes	65 (32.5)	34 (28.8)	31 (37.8)	0.18
No	135 (67.5)	84 (71.2)	51 (62.2)	
Employed				
Yes	104 (52.0)	50 (42.4)	54 (65.9)	<0.01*
No	96 (48.0)	68 (57.6)	28 (34.1)	
Previous violence-related injury				
Yes	98 (49.0)	70 (59.3)	28 (34.1)	<0.01*
No	102 (51.0)	48 (40.7)	54 (65.9)	
Recurrent violence-related injury†				
Yes	61 (30.5)	57 (48.3)	4 (4.9)	<0.01*
No	139 (69.5)	61 (51.7)	78 (95.1)	
Current mental disorder				
Yes	119 (59.5)	79 (66.9)	40 (48.8)	0.01*
No	81 (40.5)	39 (33.1)	42 (51.2)	
Any alcohol or other drugs (AOD)				
Yes	86 (43.0)	59 (50.0)	27 (32.9)	0.02*
No	114 (57.0)	59 (50.0)	55 (67.1)	
AOD and another mental disorder				

Yes	48 (24)	9 (11.0)	39 (33.1)	<0.01*
No	152 (76)	73 (89.0)	79 (66.9)	
Community violence (mean, sd)	5.9, 3	6.6, 2.6	4.8, 3.2	<0.01*
Lifetime trauma^{††} (med, range)	7, 48	8, 48	6, 44	0.02*

† More than 1 violence-related injury in previous five years

†† Lifetime traumatic events, excluding violence-related injury experiences

4.4.2 Violence-related injury characteristics

The injury characteristics presented in Table 4.2 reveal that most perpetrators were not intimate partners or family. The trigger reported for most of the injuries was a fight or argument. The injury scenario differed for male and female victims. Male victims were more likely to be stabbed and injured by a stranger or an acquaintance. They were more likely to be injured on a street, while most female victims sustained their injuries in a house. Female victims were more likely to be injured by a blunt object and 96% of female victims were injured by a known perpetrator.

Table 4.2 Violence-related injury characteristics by gender

	All violence-related injuries	Male	Female
	n=118 (%)	n=92 (%)	n=26 (%)
Injury perpetrator			
Partner/ex-partner	15 (12.9)	7 (7.8)	8 (30.8)
Family	12 (10.3)	6 (6.7)	6 (23.1)
Acquaintance	50 (43.1)	39 (43.3)	11 (42.3)
Stranger	39 (33.6)	38 (42.2)	1 (3.8)
Injury mechanism			
Blunt	56 (47.5)	32 (34.8)	23 (88.5)
Stab	60 (50.8)	57 (62.0)	3 (11.5)
Don't know	2 (1.7)	2 (2.2)	0
Injury reason			

Fight/argument	64 (57.7)	44 (51.2)	20 (80.0)
Crime	33 (29.7)	31 (36.0)	2 (8.0)
Gang	5 (4.5)	5 (5.8)	0
Other	9 (8.1)	6 (7.0)	3 (12.0)
Injury place			
House	54 (45.8)	30 (32.6)	24 (92.3)
Street	57 (48.3)	55 (59.8)	2 (7.7)
Other	7 (5.9)	7 (7.6)	0
Injury activity			
Travelling	41 (35.7)	39 (43.8)	2 (7.7)
Socialising/drinking	41 (35.7)	28 (31.5)	13 (50.0)
Leisure	26 (22.6)	15 (16.9)	11 (42.3)
Other	7 (6.1)	7 (7.9)	0

4.4.3 Injury predictors

The unadjusted and adjusted effects of participant demographic, injury and trauma characteristics on: 1) recurrent violence-related injury; 2) violence-related injury presentation; and 3) any previous violence-related injury are presented in Tables 4.3, 4.4 and 4.5.

After adjusting for the effects of the other variables in the model, recurrent violence-related injury was predicted by high frequencies of lifetime traumatic events (excluding violence-related injury experiences) (OR =1.04, 95% CI 1-1.07). (See Table 4.3 below.)

Table 4.3 Logistic regression results for demographic, mental disorder and trauma correlates of recurrent violence-related injury in the preceding five years (n=200)

Variable	Recurrent injury (5 years)		
	Yes (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age			
18-25	19 (31.1)	1.00	1.00
25-40	31 (50.8)	1.22 (0.6-2.45)	0.96 (0.42-2.22)
>40	11 (18)	0.55 (0.23-1.3)	
Gender			
Male	45 (73.8)	1.00	1.00
Female	16 (26.2)	0.63 (0.33-1.23)	0.58 (0.25-1.35)
Race			
Black	28 (45.9)	1.00	Not included
Coloured	33 (54.1)	1.54 (0.84-2.82)	
Relationship status			
Alone	31 (50.8)	1.00	Not included
In a relationship	30 (49.2)	1.14 (0.62-2.08)	
Completed high school			
No	44 (72.1)	1.00	Not included
Yes	17 (27.9)	0.73 (0.38-1.42)	
Employed			
No	37 (60.7)	1.00	1.00
Yes	24 (39.3)	0.48 (0.26-0.88)*	0.74 (0.35-1.58)
Any current mental disorder			
No	16 (26.2)	1.00	1.00
Yes	45 (73.8)	2.47 (1.28-4.78)*	2.56 (0.86-7.65)
Any AOD			
No	28 (45.9)	1.00	1.00
Yes	33 (54.1)	1.91 (1.04-3.52)*	0.66 (0.19-2.31)
AOD and another mental disorder			
No		1.00	1.00
Yes		4.00 (1.81-8.84)*	1.23 (0.41-3.63)
Community violence (mean, SD)	6.8, 2.6	1.17 (1.03-1.31)*	1.06 (0.92-1.23)
Lifetime trauma (med, range)	10, 48	1.05 (1.02-1.08)*	1.04 (1-1.07)*

In the multivariate model (see Table 4.4) for violence-related injury presentation, presentation for these injuries was significantly associated with male gender (OR=0.22, 95% CI 0.1-0.5) and high levels of witnessed community violence (OR = 1.16, 95% CI 1.01-1.32).

Table 4.4 Logistic regression results for demographic, mental disorder and trauma correlates of violence-related injury presentation (n=200)

Variable	Violence-related injury presentation		
	Yes (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age			
18-25	40 (33.9)	1.00	1.00
25-40	54 (45.8)	0.84 (0.42-1.69)	0.99 (0.41-2.37)
>40	24 (20.3)	0.40 (0.19-0.86)*	0.45 (0.18-1.15)
Gender			
Male	92 (78)	1.00	1.00
Female	26 (22)	0.30 (0.16-0.55)*	0.22 (0.1-0.5)*
Race			
Black	62 (52.5)	1.00	
Coloured	55 (46.6)	1.03 (0.58-1.82)	Not included
Other	1 (0.8)	0.69 (0.04-11.39)	
Relationship status			
Alone	65 (55.6)	1.00	Not included
In a relationship	52 (44.4)	0.78 (0.44-1.38)	
Completed high school			
No	84 (71.2)	1.00	Not included
Yes	34 (28.8)	0.67 (0.37-1.21)	
Employed			
No	68 (57.6)	1.00	1.00
Yes	50 (42.4)	0.38 (0.21-0.68)*	0.48 (0.23-1.03)
Any current mental disorder			
No	39 (33.1)	1.00	1.00
Yes	79 (66.9)	2.13 (1.19-3.79)*	2.30 (0.83-6.34)
Any AOD			
No	59 (50)	1.00	1.00
Yes	59 (50)	2.04 (1.14-3.66)*	0.29 (0.09-1.02)
AOD and another mental disorder			

No	59 (50)	1.00	1.00
Yes	59 (50)	2.04 (1.14-3.66)*	3.16 (0.94-10.68)
Community violence (mean, SD)	6.6, 2.6	1.23 (1.1-1.38)*	1.16 (1.01-1.32)*
Lifetime trauma (med, range)	8, 48	1.03 (1-1.07)*	1.00 (0.96-1.03)

Finally, the multivariate model (see Table 4.5) for those participants with any previous violence-related injury during their lifetime - not only in the preceding five years - revealed the following predictors: the 25 to 40 year old age category (OR=2.53, 95% CI 1.09-5.83), have an AOD use disorder (OR=3.48, 95% CI 1.03-11.84) and have experienced high frequencies of lifetime traumatic events apart from violence-related injury (OR=1.04, 95% CI 1-1.08).

Table 4.5 Logistic regression results for demographic, mental disorder and trauma correlates of any previous violence-related injury (n=200)

Variable	Any previous violence-related injury lifetime		
	Yes (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age			
18-25	22 (22.4)	1.00	1.00
25-40	49 (50)	2.29 (1.16-4.5)*	2.53 (1.09-5.83)*
>40	27 (27.6)	1.73 (0.82-3.65)	1.77 (0.72-4.35)
Gender			
Male	75 (76.50)	1.00	1.00
Female	23 (23.5)	0.42 (0.23-0.78)*	0.47 (0.22-1.01)
Race			
Black	48 (49.5)	1.00	Not included
Coloured	49 (50)	1.35 (0.77-2.37)	
Relationship status			
Alone	48 (49)	1.00	Not included
In a relationship	50 (51)	1.38 (0.79-2.42)	
Completed high school			
No	71 (72.4)	1.00	Not included
Yes	27 (27.6)	0.64 (0.35-1.17)	
Employed			
No	47 (48)	1.00	Not included
Yes	51 (52)	1.00 (0.58-1.75)	
Any current mental disorder			
No	30 (30.6)	1.00	1.00
Yes	68 (69.4)	2.27 (1.27-4.04)*	1.33 (0.5-3.52)
Any AOD			
No	44 (44.9)	1.00	1.00
Yes	54 (55.1)	2.69 (1.51-4.78)*	3.48 (1.03-11.84)*
AOD and another mental disorder			
No	44 (44.9)	1.00	1.00
Yes	54 (55.1)	2.69 (1.51-4.78)*	0.39 (0.12-1.23)
Community violence (mean, SD)	6.5, 2.7	1.15 (1.03-1.28)*	1.06 (0.93-1.2)
Lifetime trauma (med, range)	10, 48	1.05 (1.02-1.09)*	1.04 (1-1.08)*

4.5 Discussion

This study aims to make a contribution in addressing the gap in the LMIC literature regarding the predictors of violence-related injury history, presentation and recurrence in an EC setting. Firstly, one of the main findings of this study is the varied categories of risk which are prominent in the violence-related injury group. The sociodemographic, mental health and community factors found in this group - for example unemployment, unsafe communities and high AOD use levels - are consistent with the findings of HIC and LMIC studies (Cheng et al., 2003; O'Donnell et al., 2009). This confirms that patients presenting to ECs with violence-related injuries are an at-risk group for mental disorders and traumatic experiences.

Second, the violence-related injury recurrence rate within the preceding five years in the total sample was 31%, while 48% of participants presenting with a violence-related injury had experienced another violence-related injury in the same time period. Over their lifetime, 59% of the participants with a violence-related injury had experienced at least one other violence-related injury. These high figures are in keeping with the international literature in both LMIC and HIC studies. For example, a study in a South African EC found that over 50% of patients presenting with a violence-related injury had experienced a previous injury in their lifetime (Stein and Van der Spuy, 1997). North American studies report recurrence rates up to 49% for violence-related injuries (Sims et al., 1989). The high injury recurrence rates found in the sample are consistent with the upper end of the range found in other studies.

Third, in the study, recurrent violence-related injury was predicted by a high frequency of lifetime traumatic events (excluding violence-related injury experiences). Many studies have investigated psychological trauma caused by injury experiences (Santiago et al., 2013), while relatively few have examined lifetime trauma as a predictor of violence-related injury. In some instances, only traumatic violent experiences (perpetration, witnessing and victimisation) have been

examined as a predictor of a further injury experience (Cheng et al., 2003). In the findings, lifetime traumatic experiences excluding violence-related injuries to the participant were shown to be a stronger predictor of further injury than witnessed community violence. Other investigators have noted the high levels of traumatic experiences, yet have not explored this factor as a predictor of injury recurrence (O'Donnell et al., 2009). There is a dearth of studies examining predictors of injury recurrence and those available focus mainly on sociodemographic, injury patterns and AOD use factors (Brooke et al., 2006; McCoy et al., 2013). In the injured LMIC EC population, lifetime trauma (other than violence-related injury experiences) predicts violence-related injury recurrence. This study contributes a further insight into violence-related injury recurrence.

Fourth, violence-related injury presentation in the sample was predicted by male gender and witnessed community violence. This finding is consistent with previous research globally, that men and boys are far more vulnerable to violence victimisation than their female counterparts (Krug et al., 2002). Furthermore, studies have shown that so-called disorganised neighbourhoods where adults are involved in crime are risk factors for violent behaviour (Herrenkohl et al., 2000). The findings in this LMIC population coincide with those reported in HIC populations.

Several limitations of this study should be considered when interpreting the findings. Firstly, the reliance on self-report data may lead to under- or over-reporting due to difficulties recalling events or the participants' desire to conceal information. Second, the cross-sectional, retrospective nature of this study and the lack of injury surveillance data limit the accuracy of the data regarding the true injury recurrence rates, probably leading to under-reporting of injuries. A longitudinal study design, with a link to a mortality database, would give a more accurate picture of injury recurrence and risk factors for repeat violence-related injury. Lastly, due to convenience sampling in the EC, the findings may not be

generalisable to the country's population. Patients who were intoxicated and those who were seriously injured were not approached. Therefore, it is possible that the AOD-using population were under-represented. Furthermore, those patients presenting with more serious injuries could constitute an even higher risk group than the patients with less severe injuries.

4.6 Conclusion

Despite these limitations, the findings of this study have a number of implications for EC practice, formulation of health policy and community interventions in LMICs. High violence-related injury recurrence rates have been found in a number of settings, including this LMIC EC context. Given the lack of mental health infrastructure and specialised mental healthcare practitioners in South Africa (Burns, 2011), the EC provides an ideal location to identify patients at risk who would otherwise not receive services. Due to the burden on existing EC staff, the use of a task-shifting approach with lay health workers could be a workable solution. This approach has been utilised successfully in a recent randomised controlled trial in Cape Town ECs (Sorsdahl et al., 2014b) and in the United States by Bernstein and colleagues (1997). Patients presenting with violence-related injuries are an at-risk group for injury recurrence, and should be screened for a psychological trauma history, AOD use and abuse, and mental disorders. Community- and hospital-based trauma-focused interventions, and the cost-effectiveness of these interventions, must be investigated for their injury prevention potential in the LMIC context.

Chapter 5: Validation of the SRQ-20 screening tool in South African ECs

5.1 Chapter overview

In the previous chapter data regarding the prevalence of recurrent violence-related injury and the predictors of violence-related injury presentation in EC patients were presented. This chapter will present the background, method, results, discussion and conclusion of another aspect of the cross-sectional study conducted in two Cape Town ECs. As pointed out in Chapter 1, there is a scarcity of data regarding psychometric properties of appropriate screening tools for mental health in LMIC EC patients. This chapter aims to address this gap and fulfil objective three of this thesis. A brief background is provided below; a more comprehensive overview is supplied in Chapter 2.

5.2 Background

As outlined in Chapter 2, mental disorders make a significant contribution to the global burden of disease and are prevalent in the South African community, with even higher levels documented in primary care populations (Carey et al., 2003; Herman et al., 2009; Murray et al., 2012; Sorsdahl et al., 2010). International data regarding mental disorder prevalence in EC populations has shown that these populations constitute an at-risk group for mental disorder and AOD use problems (Booth et al., 2011; Dicker et al., 2011; Saliou et al., 2005). The EC study reported in Chapter 3 of this thesis documented high prevalence rates of mental disorder and previous studies have also documented high levels of AOD use among South African EC patients (Parry et al., 2005; Plüddemann et al., 2004), suggesting that the South African picture is similar to that in ECs around the world. Given that mental disorders are prevalent in these primary care and EC settings, some have advocated for mental disorder screening in these patients, especially in LMICs where there is a substantial treatment gap for mental disorders (Houry et al., 2009; Patel et al., 2008).

Many tools have been developed for healthcare settings. Some tools screen for specific disorders such as the BDI for depression (Beck & Steer, 1993), while others elicit symptoms of general psychological distress, such as the K10 or the SRQ-20 (Harding et al., 1980; Kessler et al., 2002). The SRQ-20 is one of the few tools specifically designed for the LMIC primary care setting. This 20-item screening tool was developed by the World Health Organization for a study investigating the prevalence of common mental disorders in LMIC primary care (Harding et al., 1980). Four tools interrogating mental health symptoms for patients from different cultural contexts were used in the development of the SRQ-20 (Harpham et al., 2003). The SRQ-20 has been widely used and validated in primary care settings and has been found to be an effective tool (Giang et al., 2006; Iacoponi & Jair de Jesus, 1989). The SRQ-20 is a promising tool for the EC context due to its short format (only 20 items) and dichotomous answers (yes/no). Furthermore it is an easy tool to administer making it an attractive option for task-shifted approaches. Currently, the SRQ-20 has not been properly validated in a South African healthcare setting and no EC validation studies were found. Therefore this study attempts to address this by exploring the psychometric properties of the SRQ-20 using the MINI as the gold standard.

5.3 Methods

Information regarding study sites, participants and procedures are found in sections 3.31-3.3.3. The measures and analysis methods utilised for this aspect of the EC study are described below.

5.3.1 Measures

In addition to a number of sociodemographic variables, such as age, gender, race, relationship status, education and employment, the following measures (see Appendix 1) were included:

5.3.1.1 Mental health status

5.3.1.1.1 MINI

The MINI is a validated, structured clinician-administered diagnostic interview which is compatible with the international Classification of Diseases (ICD-10) and the DSM-IV (Sheehan et al., 1998). The MINI is widely used in clinical and research settings. This measure provided a mental disorder diagnosis for 12 month and lifetime prevalence of a mental disorder. The MINI consists of the following modules: major depressive disorder (current, past and recurrent), suicidality, manic episode (current and past), hypomanic episode (current and past), bipolar I and II disorders (current and past), bipolar disorder not otherwise specified (current and past), panic disorder (current and lifetime), agoraphobia (current), social phobia (current), obsessive-compulsive disorder (current), posttraumatic disorder (current), alcohol abuse and dependence (past 12 months), drug abuse and dependence (past 12 months), psychotic disorders (current and lifetime), mood disorders with psychotic features (current and lifetime), anorexia nervosa (current), bulimia nervosa (current), generalised anxiety disorder (current) and antisocial personality disorder (lifetime).

5.3.1.1.2 SRQ-20

The SRQ-20 is a 20-item self-report screening tool developed by the WHO specifically for the LMIC primary healthcare setting. It employs a yes/no answer format and is designed to detect non-specific psychological distress, including suicidality (Beusenbergh and Orley, 1994). The original format of the tool was utilised, which has not yet been culturally adapted for South African populations. The time frame utilised for the administration of the SRQ-20 was the preceding month.

Examples of items of the tool are as follows:

Do you often have headaches?

Have you lost interest in things?

5.3.2 Data analysis

Data were analysed using IBM SPSS Statistics version 20. Receiver operating characteristic (ROC) analysis was performed to evaluate the screening properties of SRQ-20 (i.e. the cutoff scores and the area under the curve statistic for the effectiveness of the tool in distinguishing mental disorder cases), using the MINI as the gold standard. (Positive cases on the MINI were those participants with a diagnosis of current depression, any current anxiety disorder or current suicidality, or a combination of the three.) Factorial validity was measured by performing a principal component analysis (PCA) with varimax rotation. The Kaiser-Guttman criterion (Guttman, 1954; Kaiser, 1960) was employed to extract factors with eigenvalues above one. As this approach is known to overestimate the number of factors extracted (Zwick and Velicer, 1986), the scree plots were examined to identify the optimal number of factors for extraction (Cattell, 1966). Only items with factor loadings above 0.4 were considered for the composition of the factors. Cronbach's alpha coefficient was examined to assess the internal consistency.

5.4 Results

5.4.1 Characteristics of the study participants

Within the sample, 67% of the participants were men and 33% were women. (See Table 5.1.) The majority of the participants were younger than 40 years old and had not completed high school education. Just over half of the sample were single and employed. Of the 200 participants, current depressive, anxiety disorders or suicidality were diagnosed in 54 individuals. A diagnosis of current major depression was present in 28 individuals and current suicidality was diagnosed in 35 participants. The current anxiety disorders diagnosed in this sample were: panic disorder (n=4), limited panic symptoms (n=4), agoraphobia (n=10), social phobia (n=2) and post-traumatic stress disorder (n=13).

Table 5.1 Sociodemographic characteristics of the study participants by gender

Variables	Total sample	Male	Female
	n=200 (%)	n=134 (%)	n=66 (%)
Age			
18-25	60 (30%)	42 (31%)	18 (27%)
25-40	86 (43%)	55 (41%)	31 (47%)
>40	54 (27%)	37 (28%)	17 (26%)
Relationship status			
In a relationship	93 (47%)	61 (46%)	32 (48%)
Single	105 (53%)	71 (54%)	34 (52%)
Completed high school			
Yes	65 (33%)	37 (28%)	28 (42%)
No	135 (67%)	97 (72%)	38 (58%)
Employment status			
Employed	104 (52%)	69 (52%)	35 (53%)
Unemployed	96 (48%)	65 (48%)	31 (47%)

5.4.2 Internal consistency and cut-off scores

Cronbach's alpha of 0.84 indicated good internal consistency. Optimal cut-off scores differed in the male and female groups. A balance between sensitivity and specificity was achieved at 4/5 in the male group, 6/7 in the female group and 5/6 for the overall sample. (See Table 5.2.) Some investigators have recommended a cut-off score of 7/8 (Harpham et al., 2003) which provided a sensitivity of 63% and a specificity of 88%.

Table 5.2 Sensitivity and specificity of the SRQ-20 at various cut-off scores for detecting common mental disorders diagnosed using the MINI

Cut-off scores	Total sample		Male		Female	
	Sensitivity (%)	Specificity (%)	Sensitivity (%)	Specificity (%)	Sensitivity (%)	Specificity (%)
1/2	96.5	44.5	96.3	45.8	96.3	41.0
2/3	94.4	55.5	92.6	58.9	96.3	46.2
3/4	87.0	63.0	77.8	68.2	96.3	48.7
4/5	85.2	69.2	74.1	74.8	96.3	53.8
5/6	83.3	76.0	70.4	79.4	96.3	66.7
6/7	68.5	82.9	63.0	85.0	74.1	76.9
7/8	63.0	88.4	59.3	89.7	66.7	84.6
8/9	55.6	93.8	48.1	95.3	63.0	89.7
9/10	50.0	95.2	40.7	97.2	59.3	89.7
10/11	46.3	95.9	37.0	98.1	55.6	89.7

5.4.3 Receiver operating characteristic curve

The receiver operator characteristic (ROC) curve analysis for the total sample revealed an area under the curve (AUC) statistic of 0.87 (SE = 0.03, 95% CI 0.82-0.92). For male participants, the AUC statistic was 0.86 (SE = 0.04, 95% CI 0.78-0.93) and the AUC statistic for the female participants was 0.87 (SE = 0.04, 95% CI 0.79-0.96). (See Figures 5.1 and 5.2.)

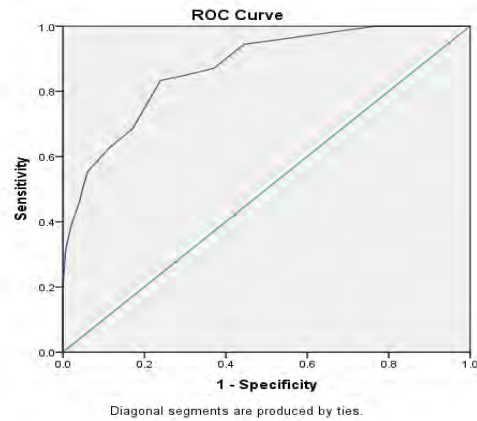


Figure 5.1 Receiver operating curve for the total sample: SRQ-20 validity

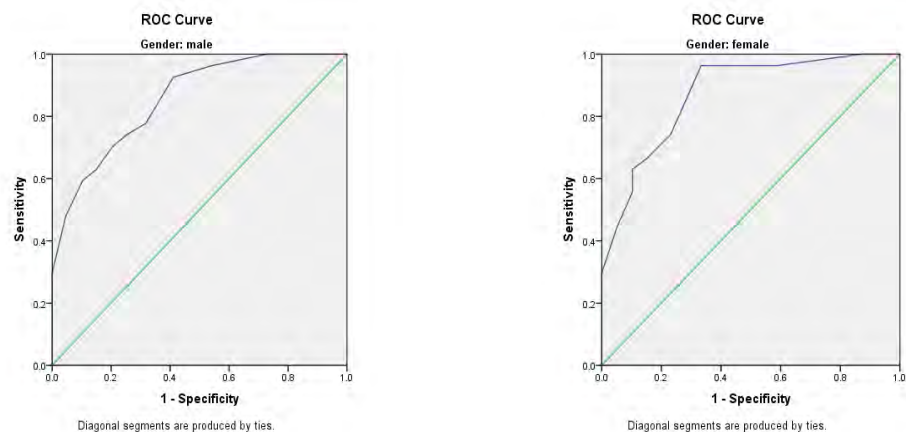


Figure 5.2 Receiver operating curves for the male and female participants: SRQ-20 validity

5.4.4 Factorial validity

A principal components analysis (PCA) was conducted on the SRQ-20 data with orthogonal rotation (varimax). The tests of suitability for PCA indicated that this analysis was appropriate. The Kaiser-Meyers-Olkin (KMO) test result of 0.828

confirmed that the sample size was adequate for conducting a PCA. Bartlett's test of sphericity was significant indicating that it was appropriate to perform a PCA.

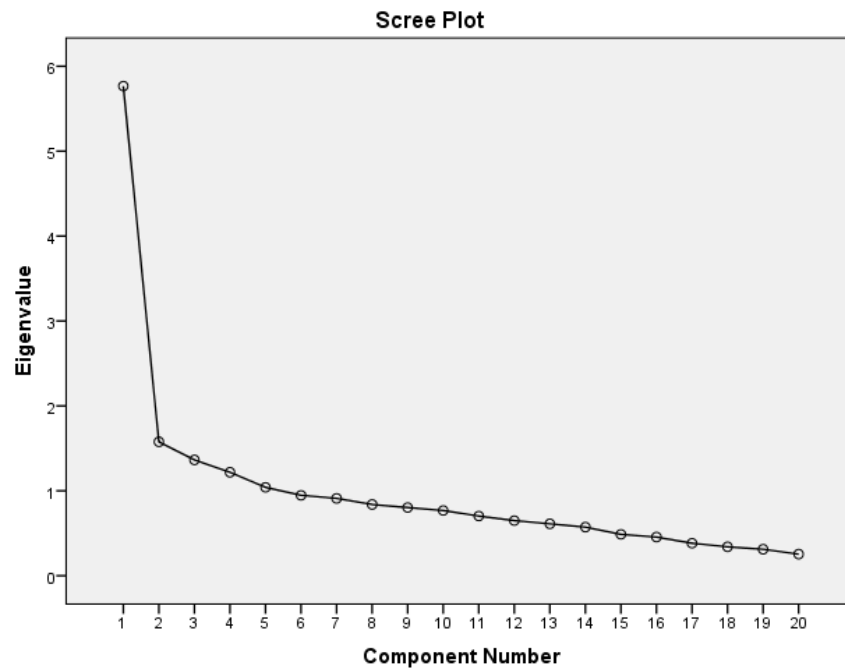


Figure 5.3 Scree plot: SRQ-20 principal components analysis

Using a combination of the Kaiser-Guttman criterion and the scree plot method (see Figure 5.3), two factors were extracted which explained 37% of the variance in the sample. (See Table 5.3 for the factor loadings.) Factor 1 was labelled 'depression and anxiety' and this factor included the following items: unhappiness, lack of enjoyment, nervousness, difficulty thinking, tiredness, easily frightened, poor sleep, difficulty making decisions, crying and loss of interest. The second factor was labelled 'somatic symptoms' and included the following items: uncomfortable feelings in the stomach, unable to be useful, poor digestion, work suffering, shaking hands and poor appetite. Three items were excluded (being tired easily, thoughts of ending your life and loss of interest) as they had low factor loadings on both factors.

Table 5.3 Factor loadings of the principal component analysis in the total sample

Items	Factor 1	Factor 2
Headaches	0.336	0.354
Poor appetite	0.241	0.445
Poor sleep	0.542	-0.004
Easily frightened	0.565	-0.153
Hands shaking	0.025	0.498
Nervousness	0.589	0.024
Poor digestion	-0.023	0.579
Difficulty thinking	0.582	0.249
Unhappiness	0.648	0.170
Crying	0.487	0.334
Lack of enjoyment	0.626	0.260
Difficulty making decisions	0.522	0.345
Work suffering	0.283	0.575
Unable to be useful	0.020	0.658
Loss of interest	0.410	0.450
Worthlessness	0.538	0.338
Suicidal thoughts	0.444	0.425
Tiredness	0.578	0.155
Uncomfortable feelings in the stomach	0.168	0.664
Being tired easily	0.491	0.407

Using the methods explained above, three factors were extracted from the female sample and two factors from the male group, explaining 46% and 40% of the variance, respectively. The KMO test result of 0.812 indicated that the male sample was adequately sized for PCA to be performed, while the KMO result of the female sample was 0.626 indicating that the sample size was less suited to performing a PCA. In both cases the Bartlett's test of sphericity was significant.

Factor 1 of the male sample was labelled 'depression and somatic symptoms' and included: work suffering, uncomfortable feelings in the stomach, difficulty making decisions, unable to be useful, thoughts of ending your life, crying, loss of interest, worthlessness, poor digestion and poor appetite. Factor 2, labelled 'anxiety and

depression', consisted of headaches, tiredness, easily frightened, lack of enjoyment, unhappiness, being tired easily, nervousness and difficulty thinking.

In the female sample, the three factors extracted were labelled 'depression and anxiety', 'somatic symptoms' and 'lethargy'. Factor 1 ('depression and anxiety') consisted of worthlessness, difficulty making decisions, unhappiness, difficulty thinking, crying, nervousness, poor sleep and easily frightened. Factor 2 ('somatic symptoms') comprised uncomfortable feelings in the stomach, headaches, shaking hands, unable to be useful, poor appetite and poor digestion. Factor 3 ('lethargy') included the following items: loss of interest, being tired easily, tiredness, lack of enjoyment and work suffering.

5.5 Discussion

This study resulted in a number of important findings. First, the SRQ-20 was shown to be a useful tool for the screening of psychological distress in an LMIC primary healthcare EC setting. Second, the ideal cut-off scores for the SRQ-20 differed by gender. Third, the factor structure of the SRQ-20 reported by males and females differed, with the items relating to somatic and depression grouping together in the male sample and separately in the female group.

In keeping with other international studies, the data indicates that the SRQ-20 is a useful tool in the South African primary healthcare EC setting. In the present study, the area under the ROC curve statistic was 0.87. This is consistent with findings from other LMIC primary care settings which ranged from 0.83 in China (Chen et al., 2009) to 0.88 in India (Patel et al., 2008). Some studies have found that the tool was more effective in their female participants; yet this was not true in the sample with the AUC for men and women being 0.86 and 0.87 respectively. This tool has previously not been validated in ECs, yet since the results are consistent with other findings in primary healthcare settings, the SRQ-20 appears to be suited to the busy EC environment.

In the present study, a balance between sensitivity and specificity was achieved at the higher cutoff score of 6/7 for female participants, as compared to the 4/5 cutoff score in the male group. Other studies performed in Rwanda and Brazil have also reported gender differences in SRQ scores with higher cutoff scores performing better for female participants than for their male counterparts (Gonçalves et al., 2008; Mari and Williams, 1986; Scholte et al., 2011). Alternatively, a few studies have found no difference in optimal cut-off scores in males and females (Chipimo and Fylkesnes, 2010; Giang et al., 2006). Investigators have recommended that optimal cut-off scores be explored in different settings before the screening tools are used in research or clinical practice (Harpham et al., 2003; Scholte et al., 2011). It has also been suggested that the resource level of the setting be taken into account when deciding on cut-off scores for identifying patients with probable mental disorder, with scores favouring specificity to be employed in lower resourced settings (Patel et al., 2008). Thus, in South Africa, higher cutoff scores should be employed in order to direct the scarce resources to the patients most in need of intervention. These findings have implications for research, clinical practice and identification of mental disorders using screening tools.

In the sample, the factor structure of the SRQ-20 differed for males and females. Male participants' data revealed a grouping of depressive and somatic symptoms in the one factor and anxiety/depression symptoms in the second factor. By contrast, in female participants, depressive and anxiety symptoms were mixed in the first factor, with somatic symptoms in another factor and the last factor comprising symptoms indicative of lethargy. At the present time, no studies have examined the factor structure of the SRQ-20 for males and females separately. Stratton et al (2013) only commented that the factor structure for their male and female participants did indicate that there were differences in participants' endorsement of various items but the factors were not further explored. Two studies, performed in India (Sen, 1987) and South Africa (Cherian et al., 1998), with a high proportion of

female respondents (76% and 59% respectively) found a factor with mixed anxiety and depressive symptoms, and another factor containing somatic symptoms. In contrast, a study in a Chinese community (Chen et al., 2009) with 58% female participation, found three factors corresponding to depressive symptoms, anxiety symptoms and somatic complaints. The investigation of the factor structure of the SRQ-20 has resulted in mixed findings, yet the gender differences have not been widely explored. Further research into cultural and gender differences could bring more understanding of the experience of common mental disorders in males and females in different settings.

The wide variety of results emanating from studies exploring the factor structure of the SRQ-20 highlight the importance of culture when eliciting mental health symptoms. The number of factors extracted during analysis of this tool range from two in Zambia (Chipimo and Fylkesnes, 2010) and Afghanistan (Ventevogel et al., 2007), to seven factors in India (Sen, 1987). The percentage variance explained by the factors extracted also differs from study to study. Methodological differences may explain much of the variation in findings from these studies. Some investigators have relied solely on the Kaiser-Guttman criterion (Chen et al., 2009), while others have used a combination (Nakimuli-Mpungu et al., 2012), as in this study. The percentage variance explained ranges from 39% (Ventevogel et al., 2007) to 87% (Nakimuli-Mpungu et al., 2012). Some investigators have found various 'domains' to be grouped in the same factor, for example anxiety and depressive symptoms (Cherian et al., 1998) or somatic and anxiety symptoms (Chen et al., 2009). In some cases, symptoms relating to lethargy or cognition are found in a group separate from other more 'obvious' common mental disorder symptoms like nervousness or crying (Iacoponi & Jair de Jesus, 1989; Tafari et al., 1991). This heterogeneity has led researchers to insist that the factors found in the SRQ-20 not be used as separate domains or subscales (Scholte et al., 2011). The investigation of the factor structure

of the SRQ-20 may be more useful in exploring cultural differences amongst populations than classifying patients into a disorder-specific category.

There are a few limitations of this study. As the sample was relatively small, comprised injured patients only, displayed high mental disorder prevalence rates and took place in two ECs in Cape Town, the results may not be generalisable to other EC or healthcare settings. Furthermore, the relatively small number of female participants also limits the generalisability of the gender differences explored in this study.

The SRQ-20 has been widely validated and in this study has been found to be useful in the busy emergency setting. Shorter versions of the tool, namely the SRQ-10 and SRQ-5 (Chipimo & Fylkesnes, 2010, 2013), have not yet been widely validated but could hold promise for an even briefer tool for ECs. A recent systematic review explored the performance of short and long screening tools for identifying depression (Akena et al., 2012). The review targeted studies from LMICs and found that the short and long tools were equally accurate; although the authors reported that the shorter tools were generally not adequate for suicidality and they recommended that the screening phase should be followed with a more in-depth diagnostic interview for those patients screening high-risk for depression. The difference in optimal cutoff scores for males and females has implications for case-finding and referral in healthcare settings and should be researched further. Optimal scores should be established for males, females, cultural groups and healthcare settings. Once the optimal scores have been ascertained, it is important that clinical protocols be put in place. For example, those with very high scores, and especially those with suicidality, could be referred directly to a mental health professional. Those with lower scores which are still above threshold could be offered a brief intervention at the healthcare facility or appropriate referral to a community-based resource. In South Africa, there is a need for widespread screening and accurate

identification of patients at risk for mental disorder, while ensuring that the existing scarce resources are not overburdened. Moreover, easily acquired research data using tools like the SRQ-20 are vital in advocating for increased mental health resources in South Africa.

The simple terminology and yes/no structure of the SRQ-20 allows administration by lay health workers in health settings. Given the scarce medical resources in LMICs, especially in the mental health sector, the SRQ-20 allows the vital screening aspect of mental health care to be task-shifted to lay health workers. In fact, healthcare staff in ECs are often loathe to be involved in screening and brief interventions (Sorsdahl et al., 2014a). This approach has been used successfully in HIC and LMIC EC settings (Bernstein et al., 1997; Sorsdahl, unpublished data). In time-limited primary healthcare and EC settings, this could be a necessary and cost-effective approach when addressing the burden of common mental disorders such as AOD use disorders and depression.

5.6 Conclusion

The SRQ-20 is a useful tool for this LMIC busy emergency setting and can be used to identify patients in need of further mental health resources. Further research is needed to establish appropriate cut-off score for males and females in various settings, the potential need for cultural adaptation of the SRQ-20 tool and possibly identify even briefer tools for EC settings. Effective screening and referral to treatment not only has implications for decreasing the mental health burden in South Africa, but also for reducing associated risky health behaviours in a vulnerable population such as problem drinking or poor medication adherence. Furthermore, the simple format, i.e. the yes/no answers, of the SRQ-20 allows for administration by lay health workers, making it an attractive tool for low-resource contexts.

Chapter 6: Validation of the ASSIST in South African EC settings

6.1 Chapter overview

In the previous chapter, data regarding the validation of the SRQ-20 in EC patients were presented. This chapter will present a brief background, methods, results, discussion and conclusion of another aspect of the cross-sectional study conducted in two Cape Town ECs. As pointed out in Chapter 1, there is a scarcity of data regarding psychometric properties of appropriate screening tools for AOD use problems in LMIC EC patients. This chapter aims to address this gap and fulfil objective four of this thesis. A brief background is provided below; a more comprehensive overview is supplied in Chapter 2.

6.2 Background

The harmful or hazardous use of alcohol or drugs is recognised as a significant factor in a range of lethal and disabling conditions which play a significant role in the global burden of disease (Lim et al., 2012). Harmful levels of AOD use contribute to risk for non-communicable diseases such as cardiovascular disease and depression (Hasin et al., 2007; Parry et al., 2011), as well as increasing transmission rates of infectious diseases such as HIV (Hahn et al., 2011). Furthermore, the consumption of substances at risky levels is strongly associated with risk for violence-related and unintentional injury (Cherpitel, 2007). Alcohol use problems and their consequences are particularly rife in South Africa, aggravating the country's so-called quadruple burden of disease due to the impact on rates of HIV/AIDS, infectious diseases, non-communicable diseases and injury. The alcohol-attributable burden of disease in South Africa is 7%, 3% higher than the global figure. The effect of alcohol on the burden of disease is particularly evident in men: the alcohol-attributable proportion of DALYs climbs to 10% in men, in contrast to the 3% in women (Schneider et al., 2007). The SASH study found a 13.3% lifetime prevalence rate for AOD use disorders in the South African population. Alcohol was the most common substance involved in AOD use disorder diagnoses: 11.4% of the population were diagnosed with

alcohol abuse and 2.6% with dependence compared to 3.9% and 0.6% respectively for drugs (Herman et al., 2009). At specialist treatment centres in South Africa, alcohol remains the primary substance for which people access these services, being responsible for 22-52% of admissions across the different provinces and 25-72% of admissions involved cannabis (Johnson et al., 2014). The percentage of patients being admitted for 'white pipe' (a mixture of cannabis and mandrax) as the primary substance rose as high as 21% for the Western Cape province. Furthermore, methamphetamine or tik was the most common primary substance (33%) for Western Cape treatment centre admissions, exceeding the proportion of patients reporting alcohol as the primary substance (22%). Since 2000, when the proportion of treatment centre patients primarily abusing tik was 0.2%, the Western Cape has seen a dramatic increase in people seeking help for tik dependence. Hospital-based data in South Africa also reflects the impact of substances on EC cases seen.

Evidence from South African studies conducted in ECs in Cape Town, Port Elizabeth and Durban found that between 33% and 62% of their injured EC sample had been using at least one illicit drug prior to their injury (Parry et al., 2005) and 35.8% to 78.9% had been using alcohol (Plüddemann et al., 2004). Due to the negative impact of excessive AOD use, the high prevalence of AOD use problems and the fact that people using substances at these levels are not readily identified, screening tools for this problem are warranted in order to identify those in need of intervention.

A number of self-report screening tools have been developed, mainly for the primary healthcare setting. These tools are discussed in more detail in Chapter 2. Two examples of these screening instruments, the AUDIT and the ASSIST, were developed and validated by the WHO. These tools are designed to distinguish between patients using substances at different risk levels, ranging from low- to high-risk users (Saunders et al., 1993). The ASSIST tool uses eight questions to interrogate the use of ten different substances and categorises patients into three risk

categories: low, moderate and high risk. Information pertaining to frequency and quantity of use, as well as consequences of use is elicited (WHO ASSIST Working Group, 2002). The substances screened for include alcohol, cannabis, cocaine and amphetamines among others. The ASSIST has been validated in healthcare settings in a number of countries, including the USA, Spain, India and Zimbabwe (Humeniuk et al., 2008a; Rubio Valladolid et al., 2014). In South Africa, the psychometric properties of the tool have not been explored; yet the ASSIST has been used successfully in South African primary care and emergency settings (Sorsdahl et al., unpublished data; Ward et al., 2008).

Therefore this study attempts to address this by exploring the psychometric properties of the ASSIST using the AOD use modules of the MINI as the gold standard.

6.3 Methods

Information regarding study sites, participants and procedures are found in sections 3.31-3.3.3. The measures and analysis methods utilised for this aspect of the EC study are described below.

6.3.1 Measures

In addition to a number of sociodemographic variables, such as age, gender, race, relationship status, education and employment, the following measures (see Appendix 1) were included:

6.3.1.1 AOD use screening

The ASSIST is a validated instrument developed by the WHO to screen for AOD use problems in primary healthcare settings (WHO ASSIST Working Group, 2002). The tool categorises people into low, moderate, or high risk for AOD-related problems. Low risk indicates that the participant is at low risk for health and other problems from their current pattern of AOD use (with scores of 0–10 for alcohol and 0–3 for illicit drugs). Moderate risk indicates that the person is at risk for health and other

problems from their current pattern of AOD use, with scores of 11–26 for alcohol and 4–26 for illicit drugs. Scores >26 indicate a high risk of experiencing severe problems and a likelihood of dependency. The substances screened for in this study include: alcohol, cannabis, methamphetamine (the local term is 'tik'), mandrax, cocaine, inhalants, hallucinogens and opioids. Derived variables from the data include the specific substance involvement score (SSI) for each substance (alcohol and each illicit drug independently) and the total substance involvement score (TSI) which covers alcohol and other drug use together. An example of a question from the ASSIST is: 'Question 2: In the past three months, how often have you used the substances you mentioned (FIRST DRUG, SECOND DRUG, ETC)' and the responses are: 'never', 'once/twice', 'monthly', 'weekly' and 'daily or almost daily'.

(See Appendix 1, section E for the ASSIST tool.)

6.3.1.2 Mental disorder diagnosis

The MINI is a validated, structured clinician-administered diagnostic interview which is compatible with the international Classification of Diseases (ICD-10) and the DSM-IV (Sheehan et al., 1998). The MINI is widely used in clinical and research settings. The AOD use disorder modules of the MINI employ four diagnostic categories, namely: alcohol abuse and dependence (past 12 months), and drug abuse and dependence (past 12 months).

6.3.2 Data analysis

Data were analysed using IBM SPSS Statistics version 20. Independent samples Mann-Whitney U tests were used to compare the ASSIST scores of those participants with an AOD use disorder diagnosis on the MINI and those without an AOD use disorder on the MINI. (For this analysis data from participants were only included if the participant had used AOD at all in the preceding three months.) Internal consistency was evaluated with Cronbach's alpha statistic for alcohol, cannabis, methamphetamine and the TSI. Receiver operating characteristic (ROC) analysis was performed to evaluate the screening properties of the ASSIST, using the

AOD use disorder modules (for alcohol and illicit drugs) of the MINI as the gold standard. [For this analysis, data from all the participants were included as per the international, multi-centre study (Humeniuk et al., 2008a).] The illicit drugs were grouped together using the highest SSI. Three groups were used to test the discriminative ability of the ASSIST for TSI, alcohol and any illicit drug use: use, abuse and dependence. The same three groups were used in comparing the ASSIST scores according to the groups by conducting an independent groups analysis of variance (ANOVA) with Scheffe's post-hoc test.

6.4 Results

6.4.1 Sociodemographic characteristics and AOD use

These data are presented in Table 6.1. The majority of the sample were 40 years of age or younger and males constituted 67% (n=134) of the 200 participants. Over two thirds had not completed high school. The proportion of participants who were single was 53% and 52% were employed. AOD use was more common in the male participants. Alcohol was used by 76.9% of the male participants and 53.03% of the females while 28.4% of the male group used cannabis compared to 4.5% of the female group. The numbers of methamphetamine and mandrax¹ users were low, used by only 8% and 5.5% of the sample respectively. None of the participants had used cocaine, inhalants, hallucinogens or opioids in the preceding three months.

Table 6.1 Sociodemographic characteristics and three-month substance use by gender

	Total	Male	Female	p-value
	n=200 (%)	n=134 (%)	n=66 (%)	
Age				
18-25	60 (30)	42 (31.3)	18 (27.3)	0.72

¹ Mandrax tablets mainly contain methaqualone as well as a small amount of an antihistamine. This illicit drug is commonly used in South Africa, and especially in the Western Cape (Bhana et al., 2002). It is often smoked in combination with tobacco and cannabis, and this combination is called 'white pipe'. (Methaqualone is a synthetic sedative-hypnotic.)

25-40	86 (43)	55 (41)	31 (47)	
>40	54 (27)	37 (27.6)	17 (25.8)	
Race				
Black	105 (53)	80 (59.7)	25 (38.5)	<0.01*
Coloured	92 (46.2)	52 (38.8)	40 (61.5)	
Other	2 (1)	2 (1.5)	0	
Relationship status				
Alone	105 (53)	71 (53.8)	34 (51.5)	0.76
Relationship	93 (47)	61 (46.2)	32 (48.5)	
Completed high school				
Yes	65 (32.5)	37 (27.6)	28 (42.4)	0.04*
No	135 (67.5)	97 (72.4)	38 (57.6)	
Employed				
Yes	104 (52)	69 (51.5)	35 (53)	0.88
No	96 (48)	65 (48.5)	31 (47)	
Substances used				
Alcohol				
Yes	138 (69)	103 (76.9)	35 (53.03)	<0.01*
No	62 (31)	31 (23.1)	31 (47)	
Cannabis				
Yes	41 (20.5)	38 (28.4)	3 (4.5)	<0.01*
No	159 (79.5)	96 (71.6)	63 (95.5)	
Tik*				
Yes	16 (8)	12 (9)	4 (6.1)	0.59
No	184 (92)	122 (91)	62 (93.9)	
Mandrax				
Yes	11 (5.5)	10 (7.5)	1 (1.5)	0.11
No	189 (94.5)	124 (92.5)	65 (98.5)	

*Tik = commonly used term in South Africa for methamphetamine

6.4.2 AOD use disorder diagnoses

AOD use disorder diagnoses were common in the sample: 43% of the participants were diagnosed with an AOD use disorder. Alcohol dependence and abuse was more common than illicit drug use disorders. Alcohol dependence was present in 24% of the sample and alcohol abuse in 10%. Ten percent of the sample met criteria for an illicit drug dependence and 7.5% for abuse. Comorbidity with another disorder (other than a substance use disorder) was found in 24% of the participants.

6.4.3 Internal consistency

Cronbach's alpha demonstrated good internal consistency for the TSI and for alcohol, cannabis, methamphetamine and mandrax. The TSI figure was 0.87 while the figures for alcohol and cannabis were 0.81 and 0.81 respectively. The Cronbach's alpha for tik and mandrax were both over 0.9, being 0.95 and 0.91 respectively.

6.4.4 Discriminative validity

ASSIST scores of participants with an AOD use disorder and the scores of participants who were users but did not meet criteria for an AOD use disorder were grouped according to this distinction. (See Table 6.2.) There were significant differences between the groups for each substance on the Mann-Whitney U tests.

Table 6.2 Comparison of ASSIST scores for participants with and without an AOD use disorder

Substance	MINI AOD use disorder	No MINI AOD use disorder	p-value
	Mean (SD)	Mean (SD)	
Alcohol (n=140)	15.80 (8.8)	4.88 (3.2)	<0.01*
Cannabis (n=43)	14.75 (7.4)	7.13 (5.4)	<0.01*
Tik (n=18)	24.93 (9.9)	2 (0)	<0.01*
Mandrax (n=13)	19.7 (10.0)	12 (0)	<0.01*

ROC analysis results show that the ASSIST was able to distinguish between low risk users (i.e. the non-users and those using at safe levels) and abuse, and abuse and dependence. The various cut-off scores and associated sensitivities and specificities are tabulated below in Table 6.3, along with the AUC statistics. The AUC figures, the sensitivities and specificities achieved were higher for distinguishing between use and abuse than between abuse and dependence for the TSI and alcohol domains. For alcohol, the AUC was 0.94 for distinguishing between use and abuse, and this dropped to 0.68 for distinguishing between abuse and dependence, while the statistic remained high for both use/abuse and abuse/dependence for illicit drugs (0.95 and 0.96).

Table 6.3 Area under the curve and cut-off scores for alcohol and illicit drugs (n=200)

ASSIST categories	AUC	Sensitivity	Specificity	Cut-off score
TSI*				
Use/abuse	0.87	79%	72%	22
Abuse/dependence	0.67	64%	61%	42
SSI-Alcohol*				
Use/abuse	0.94	85%	89%	6.5
Abuse/dependence	0.68	60%	60%	14.5
SSI-Illicit drugs				
Use/abuse	0.95	93%	93%	1
Abuse/dependence	0.96	90%	87%	18

*TSI = total substance involvement

*SSI = specific substance involvement

Results of the ANOVA revealed significant differences between the ASSIST scores of the three groups, namely: use or non-use, abuse and dependence as tabulated in Table 6.4. The results of the Scheffé's posthoc test are tabulated in Table 6.5. Again, the differences between the groups were mostly significant, especially between the use and abuse groups; although amongst the methamphetamine or tik-using participants, the difference between the scores of the dependent and abusing groups was significant, while the difference between the using and abusing groups was not.

Table 6.4 ANOVA results: discrimination between use and abuse; and abuse and dependence categories (n=200)

	df	F	p-value
TSI*	2, 19	93.24	<0.01*
SSI-Alcohol*	2, 20	63.88	<0.01*
SSI-Cannabis	2, 20	18.88	<0.01*
SSI-Tik	2, 20	14.48	<0.01*
SSI-Mandrax	2, 20	6.18	<0.01*

*TSI = total substance involvement

*SSI = specific substance involvement

Table 6.5 Scheffé's posthoc test results: discrimination between use and abuse; and abuse and dependence categories (n=200)

Score	Mean difference	p-value
TSI*		
Use/abuse	3.74	<0.01*
Abuse/dependence	15.3	0.01*
SSI-Alcohol*		
Use/abuse	7.55	<0.01*
Abuse/dependence	4.6	0.02*
SSI-Cannabis		
Use/abuse	3.61	0.02*
Abuse/dependence	1.97	0.36
SSI-Tik		
Use/abuse	1.14	0.74
Abuse/dependence	4.58	0.02*
SSI-Mandrax		
Use/abuse	1.05	0.60
Abuse/dependence	1.63	0.35

*TSI = total substance involvement

*SSI = specific substance involvement

6.5 Discussion

The results of this study yielded a number of significant findings. First, the ASSIST performed well in the South African EC setting. Second, a low cut-off score for discriminating between use and abuse of illicit drugs was found on ROC analysis as well as a slightly lower cut-off score for distinguishing between use and abuse of alcohol. Third, the ASSIST performed better in distinguishing between low risk use and abuse in this EC sample, than between abuse and dependence of all substances with the exception of methamphetamine users.

The ASSIST appears to be a useful screening tool for use in South African EC settings. These findings are consistent with previous studies investigating the psychometric properties of the ASSIST in HICs and LMICs (Humeniuk et al., 2008a; Rubio Vallolid

et al., 2014). The various domains (alcohol, cannabis, mandrax and the TSI) demonstrated good internal consistency on the Cronbach's alpha statistic which closely coincided with the results of a large validation study conducted in seven countries. In this study, the TSI domain Cronbach's alpha was 0.87 and 0.89 in the international study (Humeniuk et al., 2008a). The alcohol and cannabis domain results, both being 0.81, also compared favourably to the multi-country validation study result of 0.84 and 0.86 (Humeniuk et al., 2008a). The methamphetamine Cronbach's alpha of 0.95 in this study matched the international result of 0.95. In this study, the mandrax domain Cronbach's alpha was 0.908; which cannot be compared as this illicit drug is not used in many countries and thus does not feature in the standard ASSIST tool. Results from an ASSIST validation study in an elderly Swiss population found a Cronbach's alpha of 0.72 for the TSI and 0.66 for alcohol (Khan et al., 2012) and further data from an adult Swiss population demonstrated internal consistency ranging from 0.74 to 0.93 (Khan et al., 2011). Thus the data from this study coincides with international data, and in some cases displayed greater internal consistency than data from other studies.

Furthermore, the ASSIST scores of participants with an AOD use disorder diagnosis on the MINI and the ASSIST scores of those without an AOD use disorder diagnosis were significantly different, once again in accordance with Humeniuk and et al (2008a). Thus, the ASSIST performed well in discriminating between these groups and can appropriately flag high-risk participants in the EC context. These findings correspond to results from primary healthcare, mental health care and specialised addiction settings in nine countries (Hides et al., 2009; Humeniuk et al., 2008a; Rubio Valldolid et al., 2014).

ROC curve analysis provided further evidence for the usefulness of the ASSIST tool. The area under the curve (AUC) statistic was over 0.80 when discriminating between use and abuse for TSI, alcohol and illicit drugs. A psychiatric sample of outpatients

and inpatients in Australia with a first episode of psychosis found AUC figures ranging from 0.71 to 0.78 (Hides et al., 2009). These investigators explored the ability of the ASSIST to discriminate between use and abuse/dependence, employing slightly different methodology to this study. Other researchers in Spain utilised a similar approach and found AUC statistics ranging from 0.85 to 0.98 (Rubio Valldolid et al., 2014). The results of this study were similar to those found in the large validation study (Humenuik et al., 2008a) where the AUC values for discriminating between use and abuse were between 0.84 and 0.97. At the present time, no other studies have validated the ASSIST in an EC setting. These results confirm previous data from other healthcare settings and provide evidence for the usefulness of this tool in ECs.

The AUC statistic demonstrating the discriminative validity of the ASSIST in distinguishing between use and abuse of illicit drugs was 0.95. A cut-off score of one achieved a 93% sensitivity and a 93% specificity indicating that, in this EC population, any drug use in the preceding three months was a significant marker for abuse. Data from the study investigating the validity of the ASSIST in first-episode psychosis patients reported cutoff scores of 2 and 1 for cannabis and methamphetamines respectively (Hides et al., 2009). Humenuik and et al (2008a) reported very similar results. The cut-off score for discriminating between use and abuse for cannabis was 1.5 and for amphetamines 0.5 (Humenuik et al., 2008a). For these scores, the sensitivities were 91% and 97%, and the specificities were 90% and 87% respectively suggesting that these extremely low cut-off scores could be appropriate for discriminating between use and abuse in many different settings. These cut-off scores deviate from the cut-off score of 4 recommended by the WHO (Henry-Edwards et al., 2003). This has implications for clinical settings whereby a score of one or more for any illicit drug should alert the health care worker to a possible an AOD use disorder diagnosis.

A cut-off score between 6 and 7 was found in this study, which was very similar to the score of 5.5 found by Humeniuk and et al (2008a). Other investigators reported an even lower score of 4 with a sensitivity of 73% and a specificity of 62% (Hides et al., 2009), while investigators in Spain found that a cutoff of 9.5 with a sensitivity of 95% and a specificity of 84% was appropriate for distinguishing between use and abuse of alcohol (Rubio Valldolid et al., 2014). The score recommended by the WHO is 11 and above for identifying alcohol abuse (Henry-Edwards et al., 2003). Again, there are clinical implications. ASSIST scores over five could be an indication that these patients need further attention. More investigation of these scores is warranted.

In this study, the ASSIST displayed poorer discriminative ability when distinguishing between abuse and dependence, than between use and abuse in the TSI and alcohol domains; yet still performed well in the illicit drug domain. This partially corresponds to the ROC curve analysis results reported by Humeniuk et al (2008a) who also noted that the ASSIST performed less well when discriminating between abuse and dependence across most of the domains, including the different illicit drug categories except for cocaine (Humeniuk et al., 2008a). This was not investigated in the other validation studies found. Once again, these results could have an impact on clinical practice and guidelines once the appropriate cutoff scores have been established. Thereafter, guidelines should be established for referral to the appropriate resources.

There are limitations to this approach. First, this data may not be generalisable to other South African EC populations due to the small sample size, limited geographical scope of the study and the fact that this study recruited injured EC patients only, who may constitute a distinct group of EC patients. Furthermore, due to the small sample, there were small numbers of individuals using illicit drugs, which also limits the generalisability of these findings. Lastly, other tests were not

conducted, such as test-retest reliability in this EC population, which could strengthen a validity study.

6.6 Conclusion

The ASSIST is an effective screening tool for use in EC settings, as well as in a variety of other healthcare contexts. Moreover, the ASSIST is an attractive option for lower resourced settings as the instrument may be administered by lay health workers. Although the study participants in this study did not report a number of illicit drugs (for example, heroin), screening with the ASSIST offers the advantage of screening for a number of substances while other tools, such as the AUDIT, screen only for one substance. However, further investigation is needed to ascertain the appropriate cutoff scores for the South African setting. Screening tools such as these are a necessary component of approaches to reducing morbidity and mortality in healthcare populations and thus could play a role in reducing the treatment gap for mental disorders and the burden of disease.

Chapter 7: Cochrane review

Psychosocial interventions in the emergency centre setting for preventing re-injury due to interpersonal violence

7.1 Chapter overview

In the previous chapter, data regarding the validation of the ASSIST in South African EC patients was presented. This chapter will present a brief background, methods, results, discussion and conclusion of a systematic review conducted according to Cochrane review methodology. As mentioned in Chapter 2, there is a lack of evidence concerning EC injury prevention interventions for patients presenting with violence-related injuries. This chapter aims to address this gap and objective five of this thesis. A brief background is provided below; a more comprehensive overview is supplied in Chapter 2.

7.2 Background

7.2.1 Description of the condition

As described in Chapter 2 (section 2.4) of this thesis, injuries due to interpersonal violence make a significant contribution to the global burden of disease, especially in young people (Gore et al., 2011; Krug et al., 2002). People who die of their injuries only represent a small proportion of the cases; many more people are hospitalised and seen in ECs as a result of an injury (Wadman et al., 2003). Thus, the burden on the healthcare system is substantial. Furthermore, since the majority of patients seen in ECs with injuries are discharged home straight from the EC within a few hours of their arrival, the EC could be an important contact point for these patients (Gal et al., 2012; Hanewinckel et al., 2010; McCaig and Burt, 2001).

In many LMICs, physical care (for example, suturing and analgesics) is the only consistent care provided, and systems are not in place to address the psychosocial

needs of patients with violence-related injuries. In other words, interactions with the medical team tend to be limited to the primary reason for presentation (i.e. the injury). Consequently, opportunities to address individual risks and the sociocultural context for re-injury are overlooked. The EC setting could provide an opportunity to reduce the injury and mental disorder burden on a population.

7.2.2 Description of the intervention

Primary prevention of re-injury includes psychosocial interventions offered to patients with violence-related injuries that are performed or initiated in the EC. One of the objectives of the intervention should be to decrease re-injury due to violence, including: mortality, self-reported re-injury or a repeat visit to an EC for injury. The intervention should have a psychosocial component.

For the purpose of this review, psychosocial interventions in ECs will include those that target individual, family and relationship level risk factors for future poor health outcomes by intervening in psychological processes or social circumstances of the participant. Such interventions in the EC may include education regarding risky behaviours, counselling, case management approaches or brief interventions for risky behaviours such as weapon-carrying and AOD abuse. These interventions could be described as secondary prevention of violence as they are implemented for at-risk individuals in order to halt a potentially recurrent 'condition' or ongoing 'disease' process.

7.2.3 How the intervention might work

Psychosocial factors associated with re-injury due to violence have been identified in patients with violence-related injuries (Cunningham et al., 2009; O'Donnell et al., 2009; Zatzick et al., 2004). Unfortunately, these needs are not always addressed (Anixt et al., 2012; Zun and Rosen, 2003). The modification of these risk factors may be instrumental in protecting individuals from future violent episodes.

7.2.4 Why it is important to do this review

Violence prevention programmes are available in a variety of settings, including schools, hospitals, communities and criminal justice settings (Hockenfull et al., 2012; Mytton et al., 2006). Various groups have been the focus of these interventions, such as people with specific mental disorders and 'delinquent' youth. Many of the hospital-based interventions target patients admitted with serious injuries due to violence, neglecting the majority of the injured patients who are seen in ECs only (Alexandrescu et al., 2009; Snider and Lee, 2009). The EC visit could represent a 'teachable moment' for those victims of violence who engage in risky behaviours (Johnson et al., 2007). Various other factors could also be targeted at these visits, such as AOD use or mental health factors which may place the patient at risk for further injury or other health consequences.

Violence-related injury and repeat injury can be costly for the state and the individual, not only with regard to direct medical costs, but also in loss of income and time away from work (Lyons et al., 2010). In the US, the cost of violent deaths and injuries was estimated to be \$37 billion in 2000, including medical care spending and lost productivity (Corso et al., 2007). Severe injuries are particularly expensive to treat, with medical costs in the US amounting to \$24,353 and lost productivity costing a further \$57,209 per injured person (Corso et al., 2007). Further consequences of interpersonal violence-related injuries include various mental health problems including AOD abuse or dependence, and even unhealthy eating and risky sexual behaviour which place the individual at risk for various infectious and chronic diseases (Ellsberg et al., 2008; Golding, 1999; Kilpatrick et al., 2003; Resnick and Acierno, 1997; Sims et al., 1989). Thus, the economic and social benefits of intervening cannot be ignored.

At the present time, it is not clear whether psychosocial interventions delivered in EC settings can reduce re-injury due to violence and, if these interventions are

beneficial, which patients would benefit the most from such assistance. The results of this review could highlight the gaps in the evidence for these interventions, as well as indicating positive steps which can be implemented by policymakers, government health departments and clinicians when modifying current EC governance and practice.

7.3 Objectives

To assess the effects of psychosocial interventions for preventing re-injury due to interpersonal violence in injured EC patients.

7.4 Methods

7.4.1 Criteria for considering studies for this review

7.4.1.2 Types of studies

The aim was to include all intervention studies including randomised controlled trial (RCTs), controlled clinical trials (CCTs), cluster-randomised trials, interrupted time series studies (ITS) and controlled before and after studies (CBAs).

7.4.1.3 Types of participants

Studies were included which involved patients presenting to an EC with injuries due to interpersonal violence. Individuals presenting with self-inflicted injuries were not included. If patients presenting with self-inflicted injuries were included in studies with participants injured due to interpersonal violence, the data was separated.

7.4.1.4 Types of interventions

Any psychosocial intervention addressing risk factors for injury due to interpersonal violence was included. Psychosocial interventions were defined as any intervention which targets psychological and/or social risk factors for interpersonal violence, rather than biological factors. Psychological interventions may include, but are not exclusive to: counselling, cognitive behavioural therapy, motivational interviewing or psychiatry/psychology referral. Social interventions may include: employment or educational interventions, mentoring, social support or case management.

Comparisons were planned between psychosocial interventions versus no intervention, and between different types of psychosocial interventions; however a meta-analysis was not possible.

7.4.1.5 Types of outcome measures

7.4.1.5.1 Primary outcomes

- Re-injury to the study participant due to interpersonal violence, measured either by self-report or medical records

7.4.1.5.2 Secondary outcomes

- Arrest/imprisonment of the study participant (not necessarily conviction)
- Self-reported verbal or physical conflict
- Change in AOD use
- Other mental health factors, including mental disorders and psychological trauma
- Change in employment or education enrollment status
- Other medical or social factors

The timing of the outcome assessments was noted.

7.4.1.6 Definitions

The following definitions were used for the purposes of this review. The WHO defines violence as “the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation” (WHO Global Consultation on Violence and Health, 1996).

Interpersonal violence is further categorised as “violence inflicted by another individual or by a small group of individuals” and is divided into community and family violence in the WHO typology of violence (Krug et al., 2002).

7.4.1.7 Search methods for identification of studies

The search was not restricted by language or publication status.

7.4.1.7.1 Electronic searches

The Cochrane Injuries Group Trials Search Co-ordinator searched the following:

1. Cochrane Injuries Group specialized register (18 October 2013);
2. Cochrane Central Register of Controlled Trials (CENTRAL, *The Cochrane Library*) (issue 9 or 12, 2013);
3. Ovid MEDLINE(R), Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid OLDMEDLINE(R) (1946 to 16 October 2013);
4. EMBASE Classic + EMBASE (OvidSP) (1947 to 16 October 2013);
5. CINAHL Plus (EBSCOhost) (1937 to 16 October 2013);
6. PsycINFO (OvidSP) (1806 to October week 3, 2013);
7. ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED) (1970 to 17 October 2013);
8. ISI Web of Science: Conference Proceedings Citation Index- Science (CPCI-S) (1990 to 17 October 2013).

The search strategies can be found in Appendix 2.

7.4.1.7.2 Searching other resources

Reference lists of retrieved articles were searched for further relevant articles.

Organisations and key personnel active in the fields of emergency medicine, trauma surgery, injury prevention and mental health were contacted for relevant studies.

The following trials registries were also searched:

- Clinicaltrials.gov (www.clinicaltrials.gov);
- International Clinical Trials Registry Platform (<http://apps.who.int/trialsearch/>).

The following conference proceedings were searched for reports of potentially relevant studies:

- WHO Milestones Meetings: 2007, 2009, 2011 and 2013
- World Conferences on Injury Prevention and Safety Promotion (abstracts published in the journal *Injury Prevention*): 2010 and 2012
- Society for Academic Emergency Medicine annual meetings (abstracts published in the journal *Academic Emergency Medicine*): 2009 to 2014.

7.4.2 Data collection and analysis

7.4.2.1 Selection of studies

The Cochrane Injuries Group's Trials Search Co-ordinator ran the relevant search strategies across the appropriate databases. Two researchers (Claire van der Westhuizen and supervisor, Katherine Sorsdahl) examined abstracts independently for inclusion. When there was any disagreement, the full text of the publication was examined. The full text articles were reviewed independently by two researchers and decisions were then made on eligibility. Any differences were resolved by discussion between the two researchers. Care was taken to ensure that each included study met the eligibility criteria and that each study was only included once. In cases where these aspects were not clear from the publications, the study authors were contacted for clarification. A limited number of authors responded to these requests.

7.4.2.2 Data extraction and management

Spreadsheet forms were designed for the purpose of recording descriptive information, summary statistics of the outcome measures, the quality scale ratings and associated commentary. Data collection forms were piloted by extracting data from two studies, independently by two researchers. The researchers then discussed the suitability of the form and made necessary changes. Study authors were contacted for any missing data.

Two researchers independently collated the following information for each study:

1. Description of the trials, including the primary researcher, the year of publication, study location and the source of funding

2. Characteristics of the interventions, including the number of participants in the intervention and control groups, the number of total drop-outs per group as well as the elapsed time between the end of the intervention and assessment, as well as the number, timing and location of contact sessions after the initial EC visit and the type of intervention eg. counselling, AOD abuse assessment and referral.
3. Characteristics of study methodology, including whether randomisation was employed.

7.4.2.3 Assessment of risk of bias in included studies

The risk of bias was assessed using the 'Risk of bias' tool, described in Chapter 8 of *the Cochrane Handbook* (Higgins et al., 2011). The following aspects were judged using the tool: sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective outcome reporting and 'other issues'. For the individual studies, each aspect was described using information gleaned from publications. Then a 'low risk of bias', 'high risk of bias' or 'unclear risk of bias' was assigned to each aspect judged. Two researchers performed the assessment and then compared the results of the assessment. Disagreements were resolved by discussion. If the available information about the study was not sufficient to make a decision, the study authors were contacted for further information.

As this review focuses on psychosocial interventions, the participants and study personnel were not blinded to the type of intervention received and delivered. Attention was paid to the blinding of personnel assessing participants at follow-up visits. A 'Risk of bias' summary table was created to illustrate the assessment, and made a summary assessment of risk of bias across the studies.

7.4.2.3 Measures of treatment effect

It was not possible to perform a meta-analysis.

7.4.2.4 Dealing with missing data

Investigators were contacted for missing data, and assessed the effect of the missing data on the results. The number of participants not completing the study was recorded, along with the full number of participants recruited.

7.4.2.5 Assessment of heterogeneity

Clinical heterogeneity was assessed by considering the different participant groups, measures and interventions. The data were considered too diverse, thus a narrative report was conducted, rather than a meta-analysis. The data are reported according to intervention type.

7.4.2.6 Assessment of reporting biases

There were too few included studies for this assessment.

7.4.2.7 Data synthesis

The studies were analysed individually. A narrative report is presented, as a meta-analysis was not possible. Subgroup and sensitivity analyses were not done as there were only two included studies.

7.5 Results

7.5.1 Description of studies

7.5.1.1 Characteristics of included studies

See Tables 7.1 and 7.2 for the characteristics of the included studies.

Table 7.1 Characteristics of included studies: Cunningham 2012

Methods	<p><i>Study type</i></p> <ul style="list-style-type: none"> • Randomised controlled trial <p><i>Country</i></p> <ul style="list-style-type: none"> • United States of America (HIC) <p><i>Setting</i></p> <ul style="list-style-type: none"> • Level one trauma centre, Hurley Medical Centre, Flint, Michigan <p><i>Duration of recruitment</i></p> <ul style="list-style-type: none"> • September 2006 – September 2009 <p><i>Duration of trial</i></p>
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	<ul style="list-style-type: none"> • Not reported <p><i>Follow-up timing</i></p> <ul style="list-style-type: none"> • 3, 6 and 12 months following the EC visit <p><i>Follow-up method</i></p> <ul style="list-style-type: none"> • Computerised self-administered survey • At EC or other convenient location (eg. home, restaurant, library)
Participants	<p><i>Inclusion criteria</i></p> <ul style="list-style-type: none"> • Adolescents aged 14-18 years • Self-reporting past-year alcohol use and aggression <p><i>Exclusion criteria</i></p> <ul style="list-style-type: none"> • Schizophrenia diagnosis • Abnormal vital signs • Accessing care after a sexual assault • Being treated for acute suicidal ideation <p><i>Number randomised</i></p> <ul style="list-style-type: none"> • For the whole trial sample: n=726 • For the violently injured participants: n=54; the rest of the study data reported will only pertain to this group <p><i>Baseline data</i></p> <ul style="list-style-type: none"> • There were no differences at baseline for the outcome data extracted, namely the peer violence variable
Interventions	<p><i>Two intervention groups and one control group were recruited</i></p> <p>(1) Control group: received a brochure (n =17)</p> <p>(2) 35-minute brief intervention delivered by computer in the EC (n =12)</p> <p>(3) 35-minute brief intervention delivered by therapist in the EC (n =25)</p> <p>Brief intervention: Combining motivational interviewing with skills training, the brief intervention for violence and alcohol included review of goals, tailored feedback, decisional balance exercise, role plays, and referrals</p> <p>Brochure: the brochure contained information on alcohol, violence and relevant community resources</p>
Outcomes	<p><i>Secondary outcomes reported</i></p> <ul style="list-style-type: none"> • Self-reported physical conflict: peer violence (data available) • Change in AOD use: Binge drinking, alcohol misuse (AUDIT-C) (data not available) • Other: violence and alcohol consequence(data not available)
Notes	<p><i>Ethics</i></p> <ul style="list-style-type: none"> • The study was approved by the study hospital and the

	<p>University of Michigan Institutional Review Boards for Human Subjects.</p> <p><i>Informed consent</i></p> <ul style="list-style-type: none"> • Consent was obtained from the parent or guardian if the participant was younger than 18 years old or from the participant themselves if they were 18 years old at the time of recruitment. • Assent was obtained from the participant if they were younger than 18 years old. <p><i>Funding</i></p> <ul style="list-style-type: none"> • The project was supported by a grant 014889 from the National Institute on Alcohol Abuse and Alcoholism. <p><i>Trial registration</i></p> <ul style="list-style-type: none"> • The trial was registered at www.clinicaltrials.gov, identifier: NCT00251212.
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Table 7.2 Characteristics of included studies: Zun 2006

Methods	<p><i>Study type</i></p> <ul style="list-style-type: none"> • Randomised controlled trial <p><i>Country</i></p> <ul style="list-style-type: none"> • United States of America <p><i>Setting</i></p> <ul style="list-style-type: none"> • Level I pediatrics and adult trauma centre in Chicago, Illinois <p><i>Duration of recruitment</i></p> <ul style="list-style-type: none"> • July 1998 - ? <p><i>Duration of trial</i></p> <ul style="list-style-type: none"> • July 1998-October 1999 <p><i>Follow-up timing</i></p> <ul style="list-style-type: none"> • 6 months and 12 months after entry into the study <p><i>Follow-up method</i></p> <ul style="list-style-type: none"> • Evaluation by case managers using the baseline interview schedule
Participants	<p><i>Inclusion criteria</i></p> <ul style="list-style-type: none"> • Patients aged 10 to 24 years • Patients presenting with injuries due to interpersonal violence <p><i>Exclusion criteria</i></p> <ul style="list-style-type: none"> • Victims of child abuse, sexual assault or IPV • Patients with severe disability • Patients who were not available for follow-up

	<p><i>Number randomised</i></p> <ul style="list-style-type: none"> • ? <p><i>Baseline data</i></p> <ul style="list-style-type: none"> • ??
Interventions	<p><i>One intervention group and one control group were recruited.</i></p> <p>(1) Case management intervention: Meetings with case manager weekly for two months, then fortnightly for two months, then monthly for two months Referrals to hospital and community services</p> <p>(2) Control: Referral brochure with contact numbers to the same services available to the intervention group</p>
Outcomes	<p><i>Primary outcome reported</i></p> <ul style="list-style-type: none"> • self-reported or state-reported (trauma registry) re-injury <p><i>Secondary outcome reported</i></p> <ul style="list-style-type: none"> • Self-reported arrest • State-reported (criminal justice records) incarceration • Drug use • Violent and non -violent delinquency • Violence victimisation • Peer delinquency
Notes	<p><i>Ethics</i></p> <ul style="list-style-type: none"> • The study was approved by Mount Sinai Hospital Institutional Review Board. <p><i>Informed consent</i></p> <ul style="list-style-type: none"> • Yes, also guardian where necessary <p><i>Funding</i></p> <ul style="list-style-type: none"> • Supported by the Joyce Foundation, Woods Fund of Chicago, Michael Reese Health Trust, The Open Society Institute–The Center on Crime, Communities, and Culture, and Baxter International <p><i>Trial registration</i></p> <ul style="list-style-type: none"> • Not stated

7.5.1.2 Characteristics of excluded studies

A number of studies identified by scanning abstracts from the electronic database searches were found to be ineligible on closer inspection, or after further information was provided by the study investigators. The reasons for exclusion are reported below in section 7.5.4.

7.5.1.3 Characteristics of studies awaiting classification

The authors of 35 papers did not reply to requests for further information regarding their studies. All of the 21 studies represented in these papers were EC-based studies and the sample group included either patients presenting with any complaint, or any kind of injury; hence the need for disaggregation of these data for the purposes of this review.

7.5.2 Results of the search

The results of the electronic database searches yielded 2 430 records, 285 of which were duplicates and were removed from the list. No further studies were identified from checking reference lists or conference proceedings. The 2 145 records were screened by two researchers independently and 80 were judged to be potentially eligible. The full text of these articles were then screened for eligibility by the same two researchers and differences in opinion were then resolved. After full text review, 41 studies were identified as being potentially eligible, of which 39 did not report data regarding patients presenting with violence-related injuries only. Authors were contacted for further information. One author replied with the necessary data, nine studies did not collect data on injury presentation, five authors no longer had access to the data and two researchers reported that the studies were ongoing and that no data was available yet. There was no response from 34 authors. Two eligible studies were included and both were RCTs.

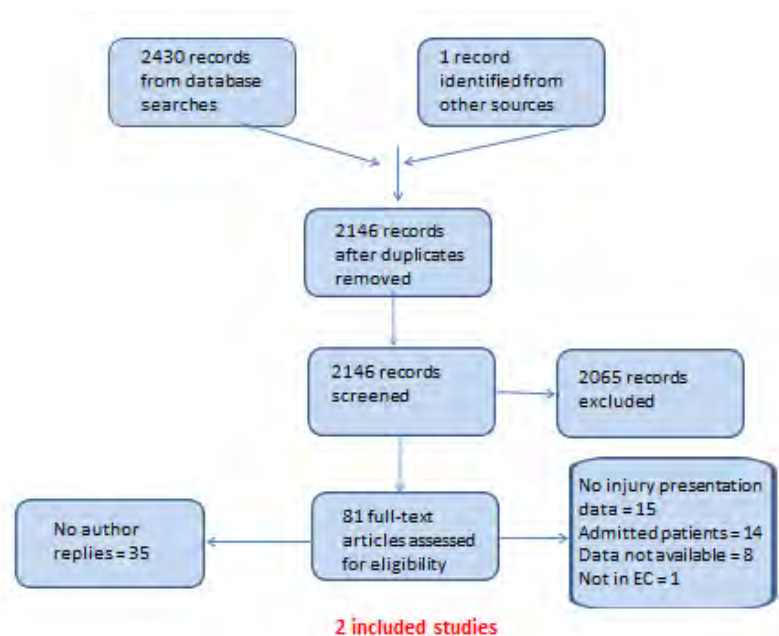


Figure 7.1 Flow diagram of the Cochrane systematic review search results

7.5.3 Included studies

Two RCTs were included in the review and data from 54 study participants were utilised from the one RCT (Cunningham et al., 2012) and 188 participants' data from the other RCT (Zun et al., 2006). It is important to note that the 188 participants were completers of the six-month follow-up only, and not the complete randomised sample; thus data from 242 participants are reported in this review (Cunningham et al., 2012; Zun et al., 2006). The RCTs were conducted in US ECs in Flint, Michigan (Cunningham et al., 2012) and Chicago, Illinois (Zun et al., 2006). Although both were conducted at level one trauma centres, they differed regarding the age of the participants, the type of intervention, the mode of delivery of the interventions, the timing of the outcome assessment and the outcomes assessed (Cunningham et al., 2012; Zun 1998).

The first trial (Cunningham et al., 2012), utilised motivational interviewing principles alongside a skills component. This trial was conducted in a level one trauma centre in the US and recruited adolescents aged 14-18 years old. Published and unpublished data were obtained. The total number of participants randomised in the trial was 726. The authors extracted the data for the 54 participants presenting with injuries due to interpersonal violence. There were two intervention groups and a comparison group. This trial provided a once-off intervention session at the EC visit for the two intervention groups.

This intervention was based on the following principles (Cunningham et al., 2009b): “... enhancing motivation to change in a respectful, nonconfrontational, and nonjudgmental manner; emphasizing choice and responsibility; supporting self-efficacy; developing a discrepancy between current behavior and future goals and values; rolling with resistance; and increasing problem recognition, motivation, and self-efficacy for change.”

The intervention groups both received an intervention based on motivational interviewing principles and incorporating normative resetting and a skills component. The skills training included role plays whereby the teens were taught refusal skills for risky behaviours, such as excessive alcohol use, conflict resolution and anger management skills. The difference between these intervention groups was that the one group received a therapist-assisted intervention using a tablet laptop computer and the other group completed the intervention solely on the computer aided by a digital 'buddy' who guided them through the intervention. The comparison group received an information brochure. The participants were followed up at three, six and twelve months after the intervention. At three months, seven participants had dropped out (13%), no further participant had left the study at six months and a further fourteen participants were lost at the twelve month follow-up. The total number of participants lost to follow-up was 21 (39%). The motivational

interviewing- and skills-based intervention study examined peer violence at three, six and twelve months after the index EC visit as one of their outcome measures. These data were extracted from the main study data by the authors and the entire sample of patients injured due to interpersonal violence at baseline was 54 participants and, by the twelve month follow-up, the group comprised 33 participants.

The second trial (Zun et al., 2006) utilised a case management intervention and was conducted at a level one trauma centre and recruited young people aged 10 to 24 years old. Published data was accessed for these results. Victims of interpersonal violence were randomised to two groups: one group received care management including an individualised care plan and facilitated access to community resources, while the comparison group received a brochure with the list of community resources available to the care-managed group. The participants were evaluated at the end of the intervention period (six months) and again at twelve months. The outcomes measured include self- or state-reported re-injury, self-reported arrest, state-reported incarceration, violent victimisation, violent and non-violent delinquency and illicit drug use.

7.5.4 Excluded studies

Of the 81 full-text articles examined, 38 were excluded. (See Figure 7.1.) Data regarding injury presentation was not collected in 15 of the cases; the patients were not recruited in the EC but in hospital wards in 14 of the cases and one study recruited patients from a AOD treatment centre. Lastly, eight authors were not able to provide data regarding their studies due to their not having access to the relevant databases or the study data was not yet available as the authors were still working with the data or the study was ongoing.

7.5.5 Risk of bias in included studies

The study by Cunningham et al. (2012) was found to have a reasonably low risk of bias (Cunningham et al., 2012), while the trial by Zun et al. (2006) displayed a high risk of bias. (See Table 7.3.) The biases are presented according to the domains of the risk of bias tables below. Figures 7.2 and 7.3 provide a summary of the risk of bias findings.

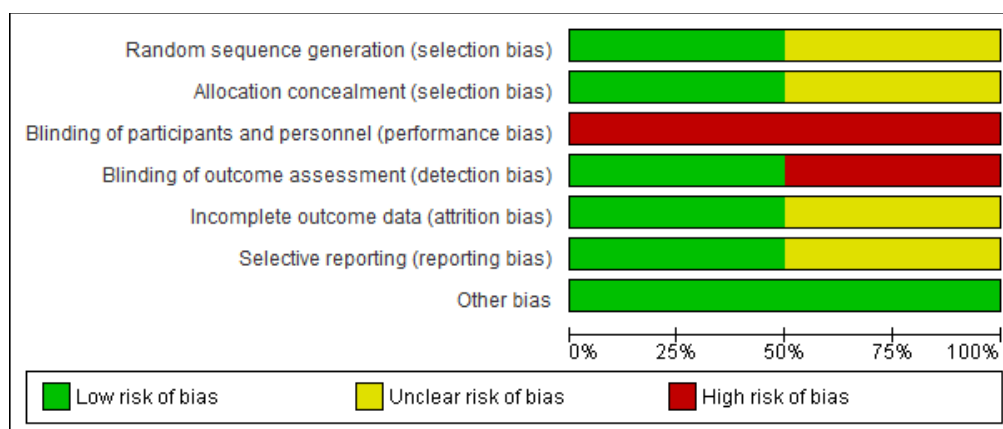
Table 7.3 Risk of bias table: Cunningham 2012

Bias	Researchers' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	The method of randomisation was a computer-generated algorithm.
Allocation concealment (selection bias)	Low risk	Numbered, sealed envelopes were used. It was not mentioned if they were opaque or not.
Blinding of participants and personnel (performance bias)	High risk	As this is a psychosocial intervention, it was not possible to blind personnel and participants.
Blinding of outcome assessment (detection bias)	Low risk	The follow-up staff were blinded and the follow-up assessments were self-administered on a computer.
Incomplete outcome assessment (detection bias)	Low risk	Numbers lost to follow-up were reported. Intention-to-treat (ITT) analysis was done. The method used was generalised estimating equations (GEE). Similar proportions of participants were lost in each group (36-42%).
Selective reporting (reporting bias)	Low risk	The protocol is available.
Other bias	N/A	N/A

Table 7.4 Risk of bias table: Zun 2006

Bias	Researchers' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	The method of random sequence generation is not mentioned.
Allocation concealment (selection bias)	Unclear risk	The method of selecting the opaque envelopes is not mentioned.
Blinding of participants and personnel (performance bias)	High risk	As this is a psychosocial intervention, it was not possible to blind personnel and participants.
Blinding of outcome assessment (detection bias)	High risk	The participants were followed up by their case managers.
Incomplete outcome assessment (detection bias)	Unclear risk	The reasons for attrition are not given. Roughly equal numbers lost from both groups. ITT analysis was not performed.
Selective reporting (reporting bias)	Unclear risk	No protocol is available.
Other bias	N/A	N/A

Figure 7.2 Cochrane risk of bias domains



	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Cunningham 2009	+	+	-	+	+	+	+
Zun 1998	?	?	-	-	?	?	+

Figure 7.3 Cochrane risk of bias summary table

7.5.5.1 Allocation (selection bias)

In the study by Cunningham et al (2012) the method of random sequence generation was reported and a computer-generated sequence was utilised and numbered sealed envelopes were used to assign the participant to a group (Cunningham et al., 2012). The trial by Zun et al (2006) did not report the randomisation method, thus conferring a high risk of bias (Zun et al., 2006).

7.5.5.2 Blinding (performance bias and detection bias)

Due to the fact that these interventions are psychosocial interventions, it was not possible to blind the participants receiving the intervention, or the study personnel delivering the intervention. In the trial by Cunningham et al (2012) , the outcome assessors were blinded to the participants' group allocation , while the trial by Zun et al (2006) appeared to use the same case manager who had been providing

services to the participant to conduct the outcome assessment possibly resulting in detection bias (Zun et al., 2006).

7.5.5.3 Incomplete outcome data (attrition bias)

Similarly, the study by Cunningham et al (2012) performed adequately in this domain, by reporting numbers lost to follow-up, conducting an intention-to-treat analysis and applying different methodologies to deal with missing data (Cunningham et al., 2012). In contrast, the study by Zun et al (2006) did not perform an ITT analysis or make allowances for any missing data using an accepted method. It appears that this study did not report the number of participants actually randomised at the start of the trial only the final numbers at the follow-up (Zun et al., 2006).

7.5.5.4 Selective reporting (reporting bias)

Cunningham et al (2012) registered their trial in a register and the protocol was available. Inspection of the protocol did not reveal any variables not reported. The trial conducted by Zun et al (2006) did not pre-register their study and no protocol was found. There appears to be evidence of selective reporting with some outcome variables reported for the six-month assessment and others only for the twelve-month assessment.

7.5.5.5 Other potential sources of bias

Nil other sources were identified.

7.5.6 Effects of interventions

Due to clinical heterogeneity found in the included studies, it was not possible to perform a meta-analysis. The studies differed greatly in the characteristics of the participants, the setting, the mode of delivery of the interventions, the timing of the outcome assessment and the outcomes assessed. Thus, a narrative approach is employed and the results will be presented according to the type of intervention, namely (1) motivational interviewing- and skills-based intervention (Cunningham et al., 2012) and (2) the case management intervention (Zun et al., 2006).

The investigators involved in the motivational interviewing- and skills-based intervention (Cunningham et al., 2012), provided data for the variable, peer violence (either aggression or victimisation). These were the only data available from this trial and the sample of participants presenting with an injury due to interpersonal violence was very small. There were no significant differences between the groups at 3, 6 or 12 months. The scores in all groups tended to decrease over time with the therapist and control groups' mean scores being the lowest at twelve months, unlike the computer-assisted group which recorded their lowest mean at six months and this figure had almost doubled at twelve months; although, due to the small sample size, it is not possible to deduce anything from these observations.

The authors reporting the case management interventions (Zun et al., 2006) presented results of both continuous and dichotomous variables. ANCOVA results are reported for various outcomes, including: violent delinquency, nonviolent delinquency, drug use and violent victimization and no significant differences were found between the two groups for these outcomes at six months. Chi-squared analysis of four dichotomous variables were performed. At six months, the other dichotomous variables, namely repeat EC visit, arrest after enrollment and incarceration after enrollment were not significant. At twelve months, the differences between the treatment and control groups' frequency of violent victimization were significantly different (8.1% vs 20.3%, $\chi^2=3.87$, $p=0.05$). Despite the fact that the results reported show a significant decrease in violent victimization at twelve months, the lack of an ITT analysis and the lack of clear data on participant numbers at each stage limits the usefulness of these findings.

7.6 Discussion

7.6.1 Summary of the main results

The purpose of this review was to evaluate the effectiveness of EC psychosocial interventions for preventing re-injury due to violence. Only two studies were

included in this review. These trials differed greatly regarding participants, intervention types, length of intervention and outcomes recorded. The study quality was also vastly different, with one study being of high quality (Cunningham et al., 2012) and the other poor (Zun et al., 2006). Due to this heterogeneity, it was not possible to conduct a meta-analysis. Additionally, as a result of the small sample size extracted from the one trial and the poor quality and reporting of the other trial it is not possible to draw any conclusions from the available data.

7.6.2 Overall completeness and applicability of evidence

Unfortunately, there was very little data available for this review, mostly due to the fact that data for participants injured due to interpersonal violence is not reported separately. Furthermore, a number of trials recruited either patients presenting with any complaint, or those presenting with any kind of injury, and few EC studies targeted patients presenting with violence-related injuries only. The studies examining this group of patients tend to be ward- or outpatient-based studies.

7.6.3 Potential biases in the review process

There is a significant risk of bias related to this review process, in fact it is not possible to comment on the findings due to this risk. Of the two included studies, a number of biases were identified in the one study. In this literature, reporting bias is present as data from the violently injured participants is not reported separately. This could be due to small numbers of these participants in a trial which lead to findings which are not significant, as in the motivational interviewing-based trial included in this review (Cunningham et al., 2012).

7.6.4 Agreements and disagreements with other studies or reviews

No other review investigating EC-based interventions for reducing violent re-injury in patients presenting with violence-related injury was found in the literature. Similar reviews include those which have looked at interventions for problem AOD use in ECs (Dinh-Zarr et al., 2004) or reviews which have synthesised the evidence regarding the effectiveness of violence prevention interventions in hospital

inpatients (Snider and Lee, 2009). The Cochrane systematic review titled 'Interventions for preventing injuries in problem drinkers' presented evidence that interventions in problem drinkers presenting to ECs reduce injury-related deaths and various types of injuries, including those due to IPV and assaults; although the authors did note that their findings could be due to chance and larger studies are needed to examine the effects of brief interventions on subsequent injury risk. In the EC brief intervention literature, most of the interventions studied have focused on AOD use (D'Onofrio et al., 2008) and many studies have employed a universal screening approach (Cherpitel et al., 2009), or have targeted patients reporting prior injuries (but not necessarily presenting with an injury) (Walton et al., 2010). This has caused some difficulties when locating data for this review.

In contrast, the hospital-based violence prevention studies have most often recruited inpatients who presented with a violence-related injury and these interventions have shown some success; although not all the evaluation studies included control groups in their evaluation (Cooper et al., 2006; Corbin et al., 2011; Shibru et al., 2007). The inpatient group could represent a very different group of patients than those seen in ECs with less severe injuries; thus it is not appropriate to draw any conclusions from these studies regarding EC-based approaches.

7.7 Conclusion

The evidence for EC-based violence prevention interventions is scarce and no conclusions can be made based on the available data. Further research is needed in this area.

7.8 Implications for practice

Due to the limited data available (only 54 participants from one study) (Cunningham et al., 2012) and the poor quality of the one included study (Zun et al., 2006), it is not possible to make any recommendations for clinical practice.

7.9 Implications for research

There is clearly a substantial gap in the evidence for EC-based interventions targeting patients presenting with injuries due to interpersonal violence. Furthermore, the current evidence available has only emerged from HICs and there is a lack of LMIC data. Therefore, more high-quality studies are needed and investigators embarking on EC-based interventions should consider collecting data on the reason for presentation and should also consider reporting the study outcomes according to patient presentation as this could impact on the characterisation of the teachable moment.

Chapter 8: Conclusion

8.1 Introduction

The previous five chapters have outlined findings from an empirical EC study and a Cochrane review in fulfilment of the objectives of this thesis. Although an in-depth discussion on the major findings was provided in each of these chapters, emphasising limitations and consistencies with past publications, a summary of all the findings and relationships between the results was not provided. This conclusion aims to fill this gap by collating and discussing the results presented in the previous five chapters.

This closing chapter will first attempt to summarise the findings related to each objective formulated in the introductory chapter. Thereafter, implications for policy and practice will be discussed, followed by opportunities for future research.

8.2 Fulfilling the research objectives

In the introductory chapter, five research objectives were formulated, which were then answered in some detail in separate studies described in the following chapters. The overall findings of these studies are discussed in brief.

Objective #1: To determine the prevalence of mental disorders and the socio-demographic and psychosocial risk factors associated with patients presenting with injuries due to violence in South African emergency centres

This objective was investigated in Chapter 3 of this thesis. To date, few studies have examined the prevalence, and socio-demographic and psychosocial risk factors associated with mental disorders among injured patients presenting to ECs. However, the available data (predominantly from HICs), has shown that this group is at-risk for mental disorders: between 20% and 63% of all injured EC patients meet criteria for a mental disorder (O'Donnell et al., 2009; Wan et al., 2006). Additionally,

there is also a scarcity of data from ECs regarding the risk factors for mental disorders and mental disorder symptoms, apart from those related to AOD use. Factors such as male gender, mental disorder symptoms and younger age have been associated with AOD use problems in these populations (Browne et al., 2013; Sanjuan et al., 2014) and these associations have been widely studied. A limited number of studies have explored the predictors of other mental disorders and these investigators have studied a number of different factors finding that mental disorders are associated with various traumatic events (Ranney et al., 2013; Rhodes et al., 2009; Roberts et al., 1998) and AOD use factors in EC patients (Booth et al., 2011; Mimiaga et al., 2010; Ranney et al., 2013). In South Africa, no EC studies have investigated the prevalence of mental disorders, and the socio-demographic and psychosocial risk factors associated with these disorders in South African ECs. Therefore, this study is the first to present data on the prevalence and predictors of mental disorders in patients presenting with violence-related injuries to South African ECs.

The injured EC sample in this study displayed a high prevalence of mental disorders, with 63% of the study participants meeting criteria for any mental disorder in their lifetime and 59.5% for a current mental disorder. The rate was significantly higher in patients presenting with violence-related injury: compared to the unintentionally injured group (69.5% vs 53.7%). Similarly, the presence of any AOD use disorder was significantly higher in the patients presenting with violence-related injury: compared to the unintentionally injured group (42% vs 32.9%). In addition to unemployment, **any current mental disorder** was significantly predicted by higher frequencies of previous violence-related injuries, while participants meeting criteria for an **AOD use disorder** were more likely to be male and have witnessed high levels of community violence. Similarly, the participants who met criteria **for comorbid AOD use and another mental disorder** were more likely to have witnessed high levels of community violence than those without these disorders.

Objective #2: To determine the prevalence of previous and recurrent violence-related injury and psychosocial risk factors in injured EC patients in South Africa.

This objective was investigated in Chapter 4 of this thesis. Data regarding the prevalence of recurrent violence-related injuries have emanated from many HICs, mainly from the North American region. Studies have shown that up to 44% of patients presenting for a violence-related injury will return with a further violence-related injury within five years (Sims et al., 1989). A single South African EC study reporting violence-related injury recurrence rates was found (Stein & Van der Spuy, 1997) and the investigators reported that over 50% of their violently injured sample had experienced a previous violence-related injury in their lifetime. In HIC and LMIC EC literature, the most commonly studied risk factor associated with injury presentation is AOD use (Cherpitel et al., 2013; Zerhouni et al., 2013). Other risk factors reported include male gender, poor physical and mental health functioning and depressive symptoms in drinkers (Borges et al., 2004; Cunningham et al., 2009; Vinson et al., 2003). Violence-related injury in youth samples has been associated with AOD use, school drop-out, weapon-carrying, community violence exposure and previous violence-related injuries (Cheng et al., 2003; Cunningham et al., 2014; Zun et al., 2005). No South African EC studies investigating the predictors of violence-related injury were found in the literature. Therefore, the data from this study is among the first to describe prevalence of previous and recurrent violence-related injury and psychosocial risk factors in injured EC patients in South Africa.

Of the total sample, 31% had experienced recurrent violence-related injuries in the preceding five years and 49% of the sample had experienced a previous violence-related injury requiring medical care in their lifetime. These figures were higher for the group presenting with a violence-related injury: 48% reported recurrent violence-related injury in the preceding five years and 59% had sustained a prior

violence-related injury in their lifetime. The results of this study showed that **presentation for violence-related injury** was predicted by male gender and high levels of witnessed community violence. **Recurrent injury within 5 years** was significantly associated with high frequencies of lifetime traumatic events (apart from violence-related injury experiences) and **any previous violence-related injury** was predicted by age (between 25 and 40 years old), an AOD use disorder diagnosis and high frequencies of lifetime traumatic events.

Objective #3: To explore the psychometric properties of the SRQ-20 screening tool for use in South African emergency centres.

This objective was investigated in Chapter 5 of this thesis. Mental disorders are highly prevalent in primary care and EC settings (O'Donnell et al., 2009; Peltzer et al., 2012). These disorders are often overlooked in healthcare settings as the symptoms of these disorders are rarely the presenting complaint and the right questions are not often asked, particularly in routine EC consultations (Downey et al., 2012; Mitchell et al., 2009). The findings of the EC study presented in Chapter 3 showed that a range of mental disorders were diagnosed in patients presenting to an EC for injury complaints. Thus, there is a need for mental disorder screening in injured EC populations.

Many different screening tools have been developed for healthcare settings, such as the CES-D and the BDI. One of the promising tools for use in the EC is the SRQ-20. It has a short format with dichotomous answers (yes/no) and is easy to administer which could allow for task-shifting approaches. Although the validity of the SRQ-20 has been partially explored in South African primary healthcare settings (Gelman et al., 2001; Thom et al., 1993), it had not been validated in South African EC settings.

In the present study, the SRQ-20 was compared to the MINI as the gold standard. It was found to be an effective tool with **good internal consistency and AUC statistics**. The **cut-off scores identified differed for men and women**, with a score of ≥ 5 indicating significant mental disorder symptoms for the male participants and a score of ≥ 7 performing better for the females. The factorial validity assessment yielded **two factors** for the total sample, namely depression and anxiety, and somatic symptoms.

Objective #4: To explore the psychometric properties of the ASSIST screening tool for use in South African emergency centres.

This objective was investigated in Chapter 6 of this thesis. Problematic AOD use makes a significant impact on the health of South Africans (Herman et al., 2009; Schneider et al., 2007) and this is particularly evident in South African ECs (Parry et al., 2005; Plüddemann et al., 2004). Despite the impact of AOD use, and the high prevalence rates in EC and primary healthcare patients in South Africa (Parry et al., 2005; Plüddemann et al., 2004; Sorsdahl et al., 2010), screening for AOD use is not routine in these settings. A number of tools are available, such as the AUDIT (Bohn et al., 1995) and the DAST (Skinner, 1982), which have been developed for use in healthcare contexts. The ASSIST screening tool (WHO ASSIST Working Group, 2002) was chosen for the study as it is simple to administer, screens for alcohol and illicit drugs and it has a relatively compact format. These features indicated that the ASSIST could be useful in ECs and in task-shifted interventions. This tool had not been validated in South African ECs.

The ASSIST was compared to the AOD use disorder modules of the MINI. With regard to discriminative validity, the ASSIST **performed well in distinguishing between participants with an AOD use disorder and those without**. Furthermore, the AUC statistics indicated that the ASSIST was **effective in distinguishing between**

participants who abused alcohol and those who did not, but was less accurate when differentiating alcohol abusers and those who were alcohol dependent. This was consistent with international findings (Humenuik et al., 2008a). For illicit drugs, the ASSIST performed equally well in distinguishing between use and abuse, and abuse and dependence. The **optimal cutoff scores found were found to be uniformly lower than international guidelines, especially regarding the illicit drugs**. Other studies reported similar findings (Hides et al., 2009; Humenuik et al., 2008a). The ASSIST was found to be an effective tool for identifying problem AOD use in this EC study.

Objective #5: To systematically evaluate the available global literature to determine the efficacy of psychosocial interventions delivered in emergency centres for preventing re-injury due to violence.

International data regarding the need for EC interventions for injured patients has been discussed above, and has been further demonstrated by the findings of the cross-sectional study reported in this thesis. A number of studies testing EC interventions are available in the literature. The majority of these studies utilise problem AOD use interventions only and measure a variety of outcomes (D'Onofrio et al., 2008; Newton et al., 2013). Some investigators have recruited patients presenting to ECs with any complaint (Cunningham et al., 2009b), others have accessed patients with any type of injury (Mello et al., 2008) and only a few studies have targeted patients presenting with violence-related injuries, despite the fact that they are a high-risk group for repeat injury, AOD use problems and mental disorders (Cheng et al., 2008). It was this high-risk group which was the focus of the systematic review reported in Chapter 7.

Only **two studies were included** in the review, mainly due to problems with accessing disaggregated data from EC studies recruiting broader samples, and not

only patients presenting with violence-related injuries; thus data was not available from the violently injured participants of many of the studies reported in the literature. A meta-analysis was not possible due to there being only two included studies which were diverse in study quality, patients recruited, interventions and outcomes measured. The two included studies were both RCTs conducted in the USA. The one study recruited adolescent patients only for an motivational interviewing-based intervention, also incorporating skills such as anger management and conflict resolution (Cunningham et al., 2012). The sample size of participants injured due to violence was extremely small and no differences were found in the frequency of peer violence experiences between the control and intervention groups at follow-up. The second RCT employed a case management approach for assault-injured adolescents and youth (Zun et al., 2006). Although the authors reported significant effects of the intervention on certain outcomes such as violent victimisation, the study methods and reporting were poor, conveying a high risk of bias. Thus no conclusion could be drawn from these data.

The **evidence base for EC psychosocial interventions** for preventing re-injury due to violence is **limited** and **further high-quality research** is necessary. Moreover, investigators should consider reporting data for participants with violence-related injuries separately, as this could have bearing on the teachable moment which could be exploited more effectively in these violently injured individuals.

8.3 Summary: bringing it all together

The summary will be structured according to the public health approach introduced in Chapter 1 and depicted below, with a focus on steps 1 to 3, given that the findings of this thesis specifically target these constructs.

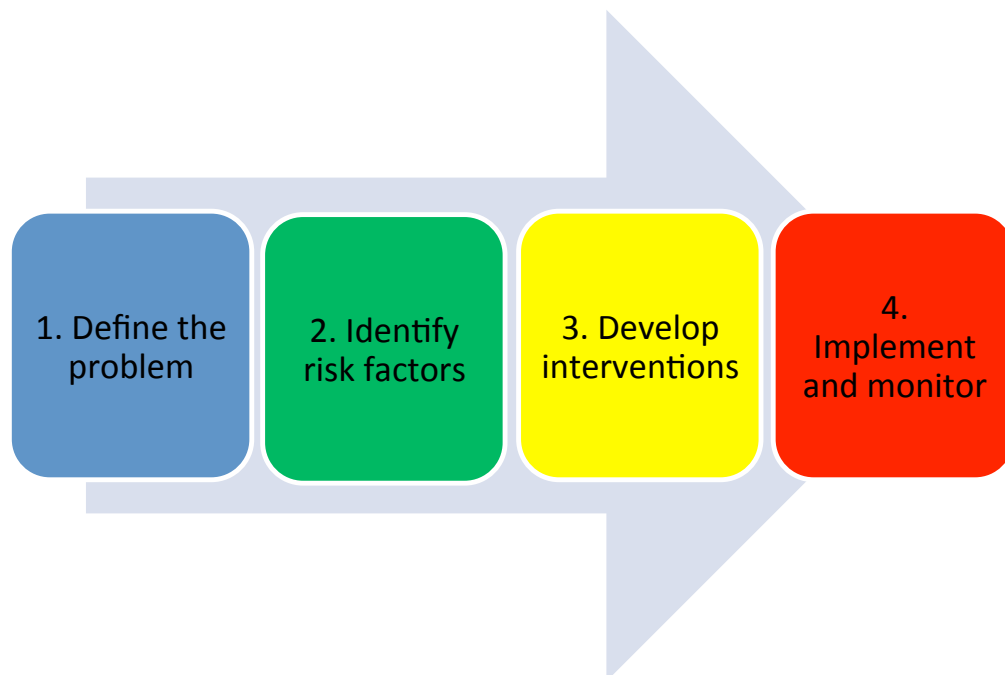


Figure 8.1 The four steps of the public health framework

8.3.1 The problem

Injured South African EC patients have high rates of mental disorders. Previous international research investigating the prevalence of mental disorders amongst injured EC patients reported that between 20% and 63% of the patients were diagnosed with a mental disorder (O'Donnell et al., 2009; Wan et al., 2006). Data provided in Chapter 4 indicate that prevalence rates for mental disorders in South African ECs may be amongst the highest reported worldwide with 63% of the study participants meeting criteria for any mental disorder in their lifetime and 60% for a current mental disorder. Given that there is presently no system in place for the detection and management of mental disorders in ECs (or in any other primary healthcare setting), the majority of these patients will probably never receive treatment.

The LMIC mental health treatment gap is a well-known phenomenon and data from the SASH study indicates that the South African situation is similar to that of other

LMICs. The SASH study found that around 75% of South Africans with a twelve-month mental disorder diagnosis do not receive treatment (Seedat et al., 2008). There are a number of areas in South Africa's mental health service infrastructure requiring attention and a few are mentioned here. First, the budget allocated to mental health has consistently lagged behind budget allocation to other health disciplines, in keeping with patterns seen in other LMICs where public health problems such as HIV/AIDS have dominated health spending (Burns, 2011; Tomlinson and Lund, 2012). Second, the numbers of mental health professionals are inadequate, especially in community health services and in rural areas (Lund and Flisher, 2006). Third, mental health care has not been adequately integrated into primary healthcare (Lund et al., 2012), although this is a priority area in South Africa's new Mental Health Policy Framework and Strategic Plan 2013-2020 (Department of Health Republic of South Africa, 2013). Fourth, there is a lack of community psychosocial rehabilitation services for patients with mental disorders (Lund et al., 2012). However, regarding cost-effectiveness and costs to society as reported in this thesis, the improvement of services for mental disorders is a good investment.

There is international evidence regarding cost-effectiveness of interventions and scaling-up of services for mental disorders (Jack et al., 2014; Patel et al., 2007). Data on the cost of medical treatment for mental disorders in South Africa was reported concerning private, outpatient care for patients with their own health insurance. The cost of medical care for individuals with bipolar mood disorder and schizophrenia cost R875 and R1 200, respectively, while their medication added additional costs of R7 512 and R7 287 annually (Jack et al., 2014). Loss of productivity contributes to the indirect costs resulting from untreated mental disorders. Data from a household survey in Ghana with regard to psychological distress and socioeconomic factors was utilised to measure loss in productivity related to psychological distress. The researchers found that moderately and

severely distressed individuals were 11% to 24% less productive than individuals who were not distressed (Canavan et al., 2013). The investigators calculated that psychological distress caused a loss of 2.7 million US dollars for the country annually. Similar figures from South Africa took into account individuals suffering from severe depression and anxiety. The annual costs of these disorders in loss of productivity amounted to 3.6 billion US dollars (Lund et al., 2013). Thus, there is a need for further intervention testing and, later, implementation of evidence-based cost-effective interventions for mental disorders.

In addition to the high prevalence of mental disorders reported in Chapter 3, Chapter 4 reveals that 31% of participants had experienced recurrent violence-related injuries in the preceding five years and 49% of the sample had experienced a previous violence-related injury requiring medical care in their lifetime. These figures were higher for the group presenting with such injuries: 48% reported recurrent violence-related injury in the preceding five years and 59% had sustained a prior violence-related injury in their lifetime.

Violence-related injury and repeat injury can be costly for the state and the individual, not only with regard to direct medical costs, but also in loss of income and time away from work (Lyons et al., 2010). In the US, the cost of violent deaths and injuries was estimated to be \$37 billion in 2000, including medical care spending and lost productivity (Corso et al., 2007). Severe injuries are particularly expensive to treat, with medical costs in the US amounting to \$24,353 and lost productivity costing a further \$57,209 per injured person (Corso et al., 2007). Further consequences of interpersonal violence-related injuries include various mental health problems including AOD abuse or dependence, and even unhealthy eating and risky sexual behaviour which place the individual at risk for various infectious and chronic diseases (Ellsberg et al., 2008; Golding, 1999; Kilpatrick et al., 2003; Resnick and Acierno, 1997; Sims et al., 1989). Thus the economic and social benefits

of intervening cannot be ignored. In accordance with the public health approach, risk factors should be identified prior to developing interventions for a public health problem.

8.3.2 The identification of risk factors for mental health and recurrent injury

It is important to investigate risk factors for mental disorder and recurrent injury in EC patients, as many of these factors are amenable to intervention. Furthermore, screening for risk factors within ECs allows for identification of these factors enabling early intervention for at-risk individuals (Agerwala and McCance-Katz, 2012). The benefits of halting or mitigating an ongoing or recurrent disease process include decreased disability, improved productivity and decreased consequences of these problems, such as further injuries and suicidality (de Girolamo et al., 2012; McKellar et al., 2012). Factors such as problematic AOD use may be addressed within the EC environment, while interventions addressing other factors such as community violence will need to be implemented within communities. Risk factors found in the empirical EC study will be discussed along with evidence from other sources regarding possible solutions.

8.3.2.1 Risk factors for mental disorders

The results of the present study found a number of risk factors associated with mental disorders, many of which have also been reported in international studies as discussed in sections 3.5 and 4.5. In this study, **any current mental disorder** was significantly predicted by unemployment and higher frequencies of previous violence-related injuries, while participants meeting criteria for an **AOD use disorder** were more likely to be male and have witnessed high levels of community violence. Similarly, the participants who met criteria for a **comorbid AOD use disorder and another mental disorder** were more likely to have witnessed high levels of community violence than those without these disorders.

Of the factors identified in this study, witnessed community violence is the most obvious factor which cannot be addressed in ECs. Evidence from the SASH study showed that witnessed violence contributed 50% of the PTSD burden in the study, significantly more than the other lifetime traumatic experiences studied (Atwoli et al., 2013). This highlights the need for intervention in communities. Interventions for violence within communities can be implemented in the affected areas through interventions such as social crime prevention and urban upgrading which decrease violence in the area thereby decreasing injury and psychological trauma due to violence in the communities. An example of this type of intervention is the Violence Prevention through Urban Upgrading (VPUU) project currently running in Khayelitsha, Cape Town (<http://www.vpuu.org.za/>). This project aims to use urban upgrading and social crime prevention, which seeks to change environmental and community factors, to tackle the high levels of violence in the area. A different approach to violent crime prevention has been developed in Cardiff, UK. ECs collaborated with the local police stations by sharing anonymised injury location data from the hospital ECs. These data aid the police in identifying hotspots leading to significant reductions in violence and related injuries (Florence et al., 2011).

8.3.2.2 Risk factors for violence-related injury and repeat injury

The results of this study showed that **presentation for violence-related injury** was predicted by male gender and high levels of witnessed community violence.

Recurrent injury within 5 years was significantly associated with high frequencies of lifetime traumatic events (apart from violence-related injury experiences) and **any previous violence-related injury** was predicted by age (between 25 and 40 years old), an AOD use disorder diagnosis and high frequencies of lifetime traumatic events.

The risk factor most amenable to intervention within ECs is problematic AOD use, providing the most likely target for South African EC interventions. As outlined in section 6.2 of this thesis, this factor makes a significant contribution to South

Africa's burden of disease, and especially to the burden of injuries in the country (Matzopoulos, 2005; Schneider et al., 2007). International EC studies have reported mixed results for SBIRT programmes within ECs, with some authors reporting reduced problematic alcohol use and others finding no effect (Bernstein et al., 2009; Daeppen et al., 2007; D'Onofrio et al., 2012). A Cochrane review investigating injury prevention interventions for problem drinkers in ECs found beneficial results regarding injury-related deaths and other non-fatal injury outcomes (Dinh-Zarr et al., 2004). Surprisingly, the authors reported that the trials finding these favourable outcomes did not all report reduced alcohol consumption. In fact, five of these trials found that a beneficial effect on alcohol consumption and numbers of participants being abstinent, while four trials found no difference in the alcohol outcomes. A recent RCT study conducted in three Cape Town ECs has provided the only data on SBIRT from South African settings (Sorsdahl et al., unpublished data). This RCT employed motivational interviewing and problem-solving therapy for problem AOD use and found that, not only did AOD use decrease, but depressive symptoms as well. Before interventions may be applied, at-risk individuals first need to be identified. Approaches to screening in ECs will be discussed next.

8.3.2.3 Screening for mental disorders and problematic AOD use in ECs

When considering a screening programme within ECs, it is necessary to define the population to be screened. In ECs there have been calls for universal screening for factors such as problem AOD use (D'Onofrio and Degutis, 2002), suicidality (Ballard et al., 2014) and depression (Boudreaux et al., 2008). While many have advocated for this universal screening in healthcare populations (Hungerford and Pollock, 2003; Nutt et al., 2010), this is controversial. The logistical and economic costs of such a large-scale exercise are often cited as reasons against the introduction of universal screening and one multicentre study found that about 50% of the patients who screened positive for depression declined treatment (Boudreaux et al., 2008; Schmitt et al., 2010). In light of these arguments, some investigators have advocated

for a targeted approach: screening only for high-risk groups. For LMIC countries with fewer resources the targeted approach seems the more attractive option.

A variety of patient groups have been put forward as target groups for screening programmes. It has been suggested that adolescent EC patients should be screened for suicidality (Harris et al., 2014; Horowitz et al., 2009). Others have advocated for generalised anxiety disorder screening in patients with repeat visits for unexplained symptoms (Ballenger et al., 2001), for mental disorder screening in HIV positive populations (Jack et al., 2014) and some investigators have called for problematic AOD use screening in all injured patients (Kelleher et al., 2013). Since data from the cross-sectional study reported in Chapter 3 of this thesis showed a high prevalence of mental disorders, including AOD use disorders, there is a need for **targeted screening** in this at-risk group, particularly for patients presenting with violence-related injuries.

There are numerous screening tools available for mental disorders in primary healthcare settings, yet not all of these tools are suitable for use in ECS. The EC provides unique challenges in that it is structured to provide acute care and rapidly attend to the needs of severely ill or injured patients; therefore, a short tool is needed which can effectively identify patients at-risk for mental disorders. This tool should also be easy to administer and not require a mental health professional to be present. In Chapters 5 and 6 of this thesis, two tools were validated in the South African EC setting, namely the SRQ-20 and the ASSIST.

One of the most prominent factors detected in the EC study was problem alcohol use. The ASSIST screening tool performed well as compared to the MINI in the injured EC patients; although the tool appears to be better suited to distinguishing between use and abuse of alcohol, than between abuse and dependence. Although, since some investigators have argued for the inclusion of AOD-abusing and AOD-

dependent patients in EC brief interventions (Field et al., 2010), this may not be a relevant consideration when selecting a screening tool. Many previous studies of SBIRT in EC settings had excluded AOD-dependent patients from the EC brief interventions, arguing that these patients should rather be referred directly to specialist care (Daepfen et al., 2007; Soderstrom et al., 2007). The ASSIST was included in the interview schedule in order to screen for all substances, yet the overwhelming majority of the patients used alcohol. In light of this pattern of AOD use in EC patients, the briefer AUDIT tool which only screens for problem alcohol use could be more appropriate, yet this tool has not yet been validated in South African ECs. In order to avoid missing those patients abusing illicit drugs, the AUDIT could be combined with one question on the frequency of current illicit drug use. As reported in Chapter 6 of this thesis, any illicit drug use was a strong indicator of a drug use disorder diagnosis. In this EC study and in the literature AOD use disorders are often found in combination with common mental disorders (Grant et al., 2004), therefore the combination of an AOD use tool and a tool measuring psychological distress would be advantageous.

The SRQ-20 is a tool designed for LMIC primary healthcare settings and this tool performed well in the EC study. The tool measures psychological distress associated with common mental disorders and this is advantageous in a lower resourced setting as the continuous scoring system of the SRQ-20 provides a measure of the severity of the symptoms (Kessler et al., 2002) allowing healthcare providers to utilise the limited resources available for the more severely distressed patients by utilising higher cutoff scores favouring specificity (Patel et al., 2008). Furthermore, it is relatively short and the yes/no format is easy to administer and can be administered by staff with limited mental health training. One of the possible shortcomings of the SRQ-20 tool is that there is only one question regarding suicidal ideation: "Has the thought of ending your life been on your mind?" The tool does not explore active suicidal ideation or previous suicide attempts at all and thus could

miss high-risk patients. The addition of a short suicidal behaviour tool such as the validated four-item Risk of Suicide Questionnaire could be considered (Horowitz et al., 2001). Furthermore, in the interest of brevity, shorter tools measuring psychological distress could be tested in South African ECs. Tools, such as the SRQ-10, the SRQ-5 or the K-6 (Chipimo and Fylkesnes, 2010, 2013; Kessler et al., 2002) could be faster to administer and just as effective as the SRQ-20; although a study in India comparing screening tools found lower sensitivities for the shorter tools in detecting common mental disorders (Patel et al., 2008). Validation studies in South African EC settings would be necessary to compare the different screening tools. Screening for common mental disorders in certain EC patient groups could play an important role in decreasing the mental health treatment gap and tackling risk factors for other conditions; although the addition of such a screening programme mandates the provision of adequate services and appropriate clinical protocols to deal with the cases detected (Horowitz et al., 2009). In South Africa, as in other LMICs, limited resources for mental health service provision exist (Sorsdahl et al., 2012a) and even the human resources necessary for screening could be problematic. Since interventions are even more time-consuming than screening, the human resources problem is particularly relevant to the design and implementation of EC interventions.

8.3.3 Interventions

8.3.3.1 Human resources

Despite the need for SBIRT in ECs and the availability of appropriate screening tools, one of the key barriers to implementing screening programmes, and SBIRT, is staff time and willingness. A UK RCT investigating brief interventions in ECs enlisted help of the EC nursing staff to conduct alcohol screening during the triage process and then provide feedback and referral. Only 28% of the adult EC patients were screened during the study period and of those patients who screened positive on the alcohol screening questions, 41% were offered appropriate referral (Peters et

al., 1998). Eventually, only 13 patients were available for the proposed intervention. Interviews conducted at the end of the study period showed that the nursing staff did not recognise the value of alcohol screening, feedback and referral as a health promotion intervention and they resented the extra demand on their time.

Recently, EC medical staff in three ECs in Cape Town were interviewed regarding the acceptability of screening and brief interventions in the ECs (Sorsdahl et al., 2014a). Although many of the staff did recognise the need for such services, a number of them were doubtful that patients would disclose their AOD use or even consent to be screened. They were also concerned about being made to take on these extra duties due to time constraints and their perceived lack of the necessary skills. The majority of the respondents felt that extra staff members would be needed to perform these tasks. A task-shifting approach, whereby lay health counsellors are employed, would shift these tasks away from the overburdened medical staff and would provide a cost-effective solution for LMICs such as South Africa, yet more research is required.

8.3.3.2 Task-shifting approaches

In recent years, the WHO has advocated for task-shifting approaches as a method of improving access to health services. Within the WHO recommendations for task-shifting, the term is explained as follows:

“Task shifting involves the rational redistribution of tasks among health workforce teams. Specific tasks are moved, where appropriate, from highly qualified health workers to health workers with shorter training and fewer qualifications in order to make more efficient use of the available human resources for health.” (World Health Organization, 2007)

In South Africa, as in many LMICs, the healthcare system is under-resourced and this is particularly evident in the mental health sector regarding material and human resources (Burns, 2011). The recent Mental Health Policy Framework and Strategic

Plan 2013-2020 adopted in the country calls for primary care re-engineering of the mental health care system aimed at increasing the community resources for mental health care and mental health promotion (Department of Health Republic of South Africa, 2013). It has been advocated that the use of lay health counsellors to deliver manualised psychosocial interventions in primary healthcare settings would be a beneficial and cost-effective strategy for integrating mental health services into primary healthcare (Lund et al., 2012). This strategy is founded on international evidence from other LMICs which has shown that interventions delivered by lay health workers are effective for a range of disorders, including depression and anxiety disorders (Patel, 2009).

Psychosocial interventions have been used for the treatment of mental disorders, problem AOD use and aggressive behaviour as mentioned in this section and in Chapter 7 of this thesis; yet they have also been applied to other health or behaviour problems. Examples include interventions addressing risky sexual behaviours (Gibson et al, 1998); and interventions encouraging compliance and lifestyle changes in diabetic patients (Peyrot and Rubin, 2007). In the violence prevention field, such approaches are often based on motivational interviewing techniques and have been utilised in populations such as adolescent EC patients (Cunningham et al., 2009b) and offenders (McMurrin, 2009).

The recent RCT in Cape Town ECs used a blended motivational interviewing and problem-solving therapy psychosocial intervention to target problem AOD use and the results were promising for AOD use and depressive symptoms (Sorsdahl et al., unpublished data). The intervention was found to be feasible and acceptable by the participants, EC staff and the lay health counsellors who delivered the intervention (Myers et al., 2012). This evidence suggests that psychosocial interventions in South African ECs could be a useful addition to the current services, yet more research is necessary. These interventions have not yet been tested in South African adolescent

EC patients and, at the present time, no EC intervention targeting aggressive behaviour or other health risk behaviours has been tested in South African ECs. While testing such interventions in healthcare facilities, factors affecting the sustainability and dissemination of these interventions should be kept in mind. One such factor is the necessary structure, support and supervision for these additional staff members.

The use of psychosocial interventions delivered by lay health counsellors would necessitate supervision by a mental health professional as well as ongoing training and fidelity checking to ensure that the counsellors continue to adhere closely to the intervention guidelines (Kakuma et al., 2011). Thus, the role of the mental health professional would undergo a transition from a purely clinical role to one that includes training and supervision of non-specialist health workers. Additionally, an important component of mobilising resources for mental health and injury prevention is intersectoral collaboration (Kakuma et al., 2011).

8.3.2.2 Intersectoral collaboration

Although this is beyond the scope of this thesis, a number of opportunities for intersectoral collaboration can be identified from the evidence presented in this thesis. Furthermore, collaboration across disciplines is a hallmark of the public health approach (Mercy et al., 1993).

As mentioned above in section 8.3.2.1, certain risk factors identified in ECs, such as witnessed community violence, cannot be addressed within the healthcare system and would need intervention from other sources. Due to the limited mental health resources in South Africa, and the multifactorial pathways leading to mental disorders and injury, it is necessary to build partnerships with other sectors. The data-sharing initiative described in section 8.3.2.1 is an example of such a link between ECs and the local police. Additional ties could be developed with social development agencies, non-governmental organisations and communities in order

to facilitate referral pathways and feedback mechanisms between the community resources and the healthcare facilities. Furthermore, many have advocated for the involvement of healthcare users in study and intervention design, as well as in healthcare delivery and monitoring (Moltu et al., 2012; Simpson and House, 2002). This approach could provide valuable insight into community life and interventions which could be beneficial. Since many of the risk factors for violence and mental disorder are found in the community, data and expertise should be shared regarding appropriate interventions in healthcare facilities and elsewhere.

8.3.4 Implementation

The final step of the public health framework calls for the implementation of interventions. In South Africa at the present time, further research is needed to ascertain which interventions should be implemented and for which group of patients. Further changes will need to occur within governmental agencies with regards to budget allocation and other resources necessary to effect change. There have been recent successes in the legislative and policy arenas which could hold promise for future improvements within the healthcare sector. Again, this is beyond the scope of this thesis and only a few points will be mentioned below.

8.3.4.1 Policy

A number of factors have been identified as necessary for the successful political prioritising of health issues. Shiffman (2007) identified factors related to the success of placing maternal mortality reduction onto national policy agendas and categorised these factors into three domains, namely transnational influence, domestic advocacy and national political environment. A number of these factors within these three domains can be identified in the South Africa context within the fields of mental health and violence prevention, and have played significant roles in driving recent successes in these fields.

First, in both mental health and injury prevention spheres, the WHO has been instrumental in promoting global norms regarding these fields, providing international data and evaluation of policy globally, as well as offering technical assistance in the form of guidelines for various aspects ranging from clinical care, for example the *mHGAP Intervention Guide* (Mental Health Gap Action Programme, 2010), to data collection systems, such as the *Injury Surveillance Guidelines* (Holder et al., 2001). Furthermore, in September 2011, Cape Town hosted the fifth WHO Milestones of a Global Campaign for Violence Prevention meeting which was supported by the South African Department of Health and attended by the Premier of the Western Cape, Helen Zille. This meeting acted as a catalyst for the development of the Western Cape Government's Integrated Provincial Violence Prevention Policy Framework which was approved by the provincial cabinet in 2013.

Second, in South Africa advocacy groups have been extremely active and instrumental in bringing about policy changes, in collaboration with other NGOs and academics. Advocacy groups, such as Gun Free South Africa (GFSA), and academics and have been successful in influencing legislation like the Firearm Control Act of 2000 and the Western Cape Liquor Act of 2009 which represent significant progress in the prevention of mental disorder and violence consequences. A key component of these successes was the presentation of supporting data and the development of key indicators whereby the impact of legislation and policy may be measured.

Third, South Africa has progressive legislation and policy in place with bearing on both mental health and violence. Examples include the Mental Health Care Act of 2002, and the related policy the Mental Health Policy Framework and Strategic Plan 2013-2020, as well as the Integrated Provincial Violence Prevention Policy Framework of the Western Cape (Department of Health Republic of South Africa, 2013; Western Cape Department of Health, 2013). Unfortunately, the EC role in the identification, mitigation and prevention of violence-related injury and mental

disorder is not specifically recognised in these documents, yet falls under the victim care and support programmes mentioned in the violence prevention policy and, in the mental health document, under the primary care re-engineering of mental health services.

In the mental health strategic plan, routine screening for mental disorder is only mentioned for antenatal populations, but the detection of depression and anxiety in primary care is listed with other district health activities. The implementation of evidence-based psychosocial interventions using a task-shifting approach is marked for implementation in 2015. Such interventions are suited to the EC setting, yet not utilising current EC human resources due to the fact that staff have limited time to deliver such programmes. Ideally, EC interventions targeting AOD use, risky behaviours and mental disorder could be implemented using trained lay health workers.

8.3.4.2 The way forward

As has been alluded to in this thesis, very little EC data on mental disorders, screening and brief interventions is available from South Africa. Furthermore, the evidence that is available has focused solely on adult EC patients in South Africa, neglecting the adolescent EC attenders. Thus, further studies are needed to ascertain mental disorder and problem AOD use prevalence in South African ECs. The use of systematic sampling methods and the recruitment of injured EC and ward patients would provide a full picture regarding the mental health and injury epidemiology of patients presenting to emergency services, providing valuable data for planning interventions and services in the future. The feasibility of routine screening for mental disorders and AOD use can be investigated, utilising a targeted approach for certain at-risk groups, such as those injured due to violence. There is also scope to test further brief interventions in these populations and to also investigate the feasibility and effectiveness of intersectoral collaborations for improving EC patient outcomes.

In conclusion, data is necessary to fuel advocacy, inform policy change, drive collaboration and change practice. Intervention in the EC environment is an important component of a healthcare response to the burden of disease in South Africa. In collaboration with other sectors and organisations, and in addition to other interventions in various settings, a positive impact can be made on problem AOD use, violence and mental disorders.

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Appendices

Appendix 1: Study Questionnaire

Risk factors associated with presentation for treatment of violence-related injuries at community emergency departments

A. Demographic information

1. Are you male or female?

<input type="checkbox"/> Male	<input type="checkbox"/> Female	<input type="checkbox"/> Did not answer
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2. How old are you?

_____	<input type="checkbox"/> Did not answer
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3.a. Were you born in South Africa?

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Did not answer
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If you weren't born in South Africa:

3.b. Where were you born? _____ Did not answer

3.c. How many years have you lived in South Africa? _____

4.a. How many children do you have? _____

If you have children:

4.b. What are their ages?

4.c. Do they live with you?

Age of child	Living with subject
	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<input type="checkbox"/> Yes <input type="checkbox"/> No

5. Are you:

<input type="checkbox"/> Single (never	<input type="checkbox"/> Dating one person	<input type="checkbox"/> Dating more than one person
--	--	--

been married)	regularly	regularly
<input type="checkbox"/> Married	<input type="checkbox"/> Living together	<input type="checkbox"/> Divorced
<input type="checkbox"/> Widowed	<input type="checkbox"/> Other (describe: _____)	<input type="checkbox"/> Did not answer

6. What is your race:

<input type="checkbox"/> Black	<input type="checkbox"/> Coloured	<input type="checkbox"/> Indian	<input type="checkbox"/> Asian
<input type="checkbox"/> White	<input type="checkbox"/> Other	<input type="checkbox"/> Did not answer	

7. What language do you speak as a home language or first language?

<input type="checkbox"/> isiXhosa	<input type="checkbox"/> isiZulu	<input type="checkbox"/> Afrikaans	<input type="checkbox"/> Sesotho sa Leboa (N Sotho)
<input type="checkbox"/> Sesotho	<input type="checkbox"/> English	<input type="checkbox"/> Setswana	<input type="checkbox"/> Tshivenda
<input type="checkbox"/> Siswati	<input type="checkbox"/> Xitsonga	<input type="checkbox"/> Other, specify _____	<input type="checkbox"/> Did not answer

7.b. What other languages do you speak?

			<input type="checkbox"/> None	<input type="checkbox"/> Did not answer
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8a. How much school did you finish? _____ (e.g. Standard 3/matric) Did not answer

8.b. If still at school, what grade are you in? _____ Did not answer

8.c. If you studied further, what is the highest education you received?

<input type="checkbox"/> Technikon diploma	<input type="checkbox"/> Bachelor Degree	<input type="checkbox"/> Honours degree	<input type="checkbox"/> Masters diploma in technology
<input type="checkbox"/> Master's degree	<input type="checkbox"/> Laureatus in technology	<input type="checkbox"/> Doctoral degree (non--medical)	<input type="checkbox"/> Other (specify) _____

9..Which of the following best describes your work situation now?

<input type="checkbox"/> Employed full-time	<input type="checkbox"/> Disabled
<input type="checkbox"/> Employed part-time	<input type="checkbox"/> Retired/pensioner
<input type="checkbox"/> Self-employed	<input type="checkbox"/> Unemployed
<input type="checkbox"/> Student	<input type="checkbox"/> Maternity leave
<input type="checkbox"/> Homemaker	<input type="checkbox"/> Other (specify) _____
<input type="checkbox"/> Did not answer	

B. Current injury

10. Triage (initial) colour: Green Yellow Orange Red

11. Nature of injury:

12. Location of injury on body (eg. neck or

arm etc)

<input type="checkbox"/> Fracture	
<input type="checkbox"/> Sprain	
<input type="checkbox"/> Cut or open wound	
<input type="checkbox"/> Bruises, superficial wound	
<input type="checkbox"/> Haematoma/swelling	
<input type="checkbox"/> Burning	
<input type="checkbox"/> Injury other organs	

13. Intent of trauma:

Unintentional (accidental, road traffic) Other _____ Don't know

Intentional

<input type="checkbox"/> Innocent bystander	<input type="checkbox"/> Crime victim	<input type="checkbox"/> Crossfire	<input type="checkbox"/> Random violence
<input type="checkbox"/> Argument	<input type="checkbox"/> Object of revenge	<input type="checkbox"/> Mistaken for intended victim	<input type="checkbox"/> Defending a friend

Did not answer

14. Mechanism of injury: How was injury caused?

<input type="checkbox"/> Traffic crash	<input type="checkbox"/> Assault with fists/feet etc	<input type="checkbox"/> Firearm/Gun	<input type="checkbox"/> Stab
<input type="checkbox"/> Fire/hot fluid	<input type="checkbox"/> Strangulation	<input type="checkbox"/> Don't know	<input type="checkbox"/> Other _____
<input type="checkbox"/> Did not answer			

15. Where did you get injured?

<input type="checkbox"/> House	<input type="checkbox"/> School	<input type="checkbox"/> Commercial area	<input type="checkbox"/> Shebeen
<input type="checkbox"/> Street/Road	<input type="checkbox"/> Other _____	<input type="checkbox"/> Don't know	<input type="checkbox"/> Did not answer

16. What were you doing when you got injured?

<input type="checkbox"/> Working	<input type="checkbox"/> Travelling	<input type="checkbox"/> Studying	<input type="checkbox"/> Sports/athletics
<input type="checkbox"/> Leisure/playing	<input type="checkbox"/> Drinking	<input type="checkbox"/> Socialising (family/friends)	<input type="checkbox"/> Other _____
<input type="checkbox"/> Did not answer			

17. Assaults:

a. Who hurt you?

<input type="checkbox"/> Spouse/Partner	<input type="checkbox"/> Ex-partner	<input type="checkbox"/> Friend	<input type="checkbox"/> Parents
<input type="checkbox"/> Other relative	<input type="checkbox"/> Stranger	<input type="checkbox"/> Police	<input type="checkbox"/> Other _____
<input type="checkbox"/> Don't know	<input type="checkbox"/> Did not answer		

b. What was the reason?

<input type="checkbox"/> Fight/quarrel	<input type="checkbox"/> Robbery	<input type="checkbox"/> Other crimes	<input type="checkbox"/> Drug-related
<input type="checkbox"/> Gang-related	<input type="checkbox"/> Political	<input type="checkbox"/> Xenophobia	<input type="checkbox"/> Sexual assault
<input type="checkbox"/> Other _____	<input type="checkbox"/> Don't know	<input type="checkbox"/> Did not answer	

18.a. Was the person who assaulted you male or female? Male Female Don't know Did not answer

18.b. Do you think there were alcohol or drugs involved? Yes No Don't know Did not answer

18.c. How did it start? _____ Don't know Did not answer

C. Previous injuries

READ: The next set of questions is about behaviours that may put someone at risk of getting hurt. No matter how well people get along, there are times when they disagree, get annoyed with each other, or get irritable with each other because they are in a bad mood, tired, or for some other reason. The questions ask about things you may have done or which may have been done to you. They may or may not apply to you. Your answers are important, even if some questions do not apply to your situation. Some of the questions may seem embarrassing, but please remember that all your answers are completely confidential and that you may choose not to answer a question.

Key for questions 19 & 20

Who?	With what?	Where?
FAM Family member	BOD body part (e.g. fist)	H House
P Partner	BLU blunt object	SCH School
EP Ex-partner	KN knife	COM Commercial area
FR Friend	GUN gun	STR Street/Road
AC Acquaintance	OTH	SHE Shebeen
CM Class mate	DK Don't know	OTH Other
CW Co-worker		DK Don't know
N Neighbour		
S Stranger		
DK Don't know		

19. How many times in the last 3 months have you been hit, kicked, punched or otherwise hurt by anyone? _____

Did not answer

By who?	What injury?	With what?	Where? (place of injury)	Did you need a dr/medical help? yes/no	Did you stay overnight at clinic/hospital for treatment? yes/no

20. How many times in the last 3 months have you hit, kicked, punched or otherwise hurt anyone?

Did not answer

Who?	With what?	Where?	Did the other person need a dr/medical help? yes/no/don't know	Did they stay overnight at clinic/hospital for treatment? yes/no/don't know

21. How many times in your life, before the last 3 months, have you had to go to a hospital or clinic for injuries caused by someone else hurting you or because you were in a fight?

Did not answer

Date (or just the year)	Clinic/hospital	What injury? Eg. Broken arm, stab leg	Did you stay in the clinic/hospital for a night or longer for treatment? (yes/no)	Fight/assault?	Were you also involved in the fighting? (yes/no)

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D. SRQ

When answering the following questions, think about how you have been feeling in the past month. If these things have happened to you often in the past month, answer yes.

1. Do you often have headaches?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
2. Is your appetite poor?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
3. Do you sleep badly?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
4. Are you easily frightened?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
5. Do your hands shake?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
6. Do you feel nervous, tense or worried?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
7. Is your digestion poor?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
8. Do you have trouble thinking clearly?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
9. Do you feel unhappy?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
10. Do you cry more than usual?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
11. Do you find it difficult to enjoy your daily activities?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
12. Do you find it difficult to make decisions?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
13. Is your daily work suffering?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
14. Are you unable to play a useful part in life?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
15. Have you lost interest in things?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
16. Do you feel that you are a worthless person?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
17. Has the thought of ending your life been on your mind?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
18. Do you feel tired all the time?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
19. Do you have uncomfortable feelings in your stomach?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
20. Are you easily tired?	<input type="checkbox"/> YES	<input type="checkbox"/> NO

E. Substance Use

Thank you for agreeing to take part in this brief interview about alcohol, tobacco products and other drugs. I am going to ask you some questions about your experience of using these substances across your lifetime and in the past three months. These substances can be smoked, swallowed, snorted, inhaled, injected or taken in the form of pills (show drug card). Some of the substances listed may be prescribed by a doctor (like amphetamines, sedatives, pain medications). For this interview, we will not record medications that are used as prescribed by your doctor. However, if you have taken such medications for reasons other than prescription, or taken them more frequently or at higher doses than prescribed, please let me know. While we are also interested in knowing about your use of various illicit drugs, please be assured that information on such use will be treated as strictly confidential.

Question 1: In your life, which of the following substances have you used:

	YES	NO
Tobacco		
Alcoholic Beverages (beer, wine etc)		
Dagga (alone)		
Mandrax & Dagga		
Mandrax (alone)		
Cocaine (rocks, coke, crack)		
Tik		
Inhalants (nitrous glue, petrol)		
Hallucinogens (LSC, acid, mushrooms, PCP, special K etc)		
Opioids (heroin, morphine, methadone, unga)		

Probe if all answers are negative: "Not even when you were in school?"

If "No" to all items, skip substance use questions.

*If "Yes" to any of these items, ask
Question 2 for each substance ever used.*

Question 2: In the past three months, how often have you used the substances you mentioned (FIRST DRUG, SECOND DRUG, ETC)

	Never	Once/Twice	Monthly	Weekly	Daily or Almost Daily
Tobacco	0	2	3	4	6
Alcoholic Beverages (beer, wine etc)	0	2	3	4	6
Dagga (alone)	0	2	3	4	6
Mandrax & Dagga	0	2	3	4	6
Mandrax (alone)	0	2	3	4	6
Cocaine (rocks, coke, crack)	0	2	3	4	6
Tik	0	2	3	4	6
Inhalants (nitrous glue, petrol)	0	2	3	4	6
Hallucinogens (LSC, acid, mushrooms, PCP, special K etc)	0	2	3	4	6
Opioids (heroin, morphine, methadone, unga)	0	2	3	4	6

If "Never" to all items in Question 2, skip to Question 6. If any substances in Question 2 were used in the previous three months, continue with Questions 3, 4 & 5 for each substance used.

Question 3: During the past three months, how often have you had a strong desire or urge to use?

	Never	Once/Twice	Monthly	Weekly	Daily or Almost Daily
Tobacco	0	3	4	5	6

Alcoholic Beverages (beer, wine etc)	0	3	4	5	6
Dagga (alone)	0	3	4	5	6
Mandrax & Dagga	0	3	4	5	6
Mandrax (alone)	0	3	4	5	6
Cocaine (rocks, coke, crack)	0	3	4	5	6
Tik	0	3	4	5	6
Inhalants (nitrous glue, petrol)	0	3	4	5	6
Hallucinogens (LSC, acid, mushrooms, PCP, special K etc)	0	3	4	5	6
Opioids (heroin, morphine, methadone, unga)	0	3	4	5	6

Question 4: During the past three months, how often has your use of substances led to health, social, legal or financial problems? (please circle)

	Never	Once/Twice	Monthly	Weekly	Daily or Almost Daily
Tobacco	0	4	5	6	7
Alcoholic Beverages (beer, wine etc)	0	4	5	6	7
Dagga (alone)	0	4	5	6	7
Mandrax & Dagga	0	4	5	6	7
Mandrax (alone)	0	4	5	6	7
Cocaine (rocks, coke, crack)	0	4	5	6	7

Tik	0	4	5	6	7
Inhalants (nitrous glue, petrol)	0	4	5	6	7
Hallucinogens (LSC, acid, mushrooms, PCP, special K etc)	0	4	5	6	7
Opioids (heroin, morphine, methadone, unga)	0	4	5	6	7

Question 5: During the past three months, how often have you failed to do what was normally expected of you because of your use of substance use? (please circle)

	Never	Once/ Twice	Monthly	Weekly	Daily or Almost Daily
Alcoholic Beverages (beer, wine etc)	0	5	6	7	8
Dagga (alone)	0	5	6	7	8
Mandrax & Dagga	0	5	6	7	8
Mandrax (alone)	0	5	6	7	8
Cocaine (rocks, coke, crack)	0	5	6	7	8
Tik	0	5	6	7	8
Inhalants (nitrous glue, petrol)	0	5	6	7	8
Hallucinogens (LSC, acid, mushrooms, PCP, special K etc)	0	5	6	7	8
Opioids (heroin, morphine, methadone, unga)	0	5	6	7	8

Ask Questions 6 & 7 for all substances ever used (i.e. those endorsed in Question 1)

Question 6: Has a friend or relative or anyone else ever expressed concern about your use of specific substances?

	No, Never	Yes, in the past 3 months	Yes, but not in the past 3 months
Tobacco	0	6	3
Alcoholic Beverages (beer, wine etc)	0	6	3
Dagga (alone)	0	6	3
Mandrax & Dagga	0	6	3
Cocaine (rocks, coke, crack)	0	6	3
Tik	0	6	3
Inhalants (nitrous glue, petrol)	0	6	3
Hallucinogens (LSC, acid, mushrooms, PCP, special K etc)	0	6	3
Opioids (unga, heroin, morphine, methadone)	0	6	3

Question 7: Have you ever tried and failed to control, cut down or stop using specific drugs?

	No, Never	Yes, in the past 3 months	Yes, but not in the past 3 months
Tobacco	0	6	3
Alcoholic Beverages (beer, wine etc)	0	6	3
Dagga (alone)	0	6	3
Mandrax & Dagga	0	6	3
Cocaine (rocks, coke, crack)	0	6	3
Tik	0	6	3

Inhalants (nitrous glue, petrol)	0	6	3
Hallucinogens (LSC, acid, mushrooms, PCP, special K etc)	0	6	3
Opioids (unga, heroin, morphine, methadone)	0	6	3

Question 8: Have you ever used any drug by injection?

	No, Never	Yes, in the past 3 months	Yes, but not in the past 3 months
	0	2	1

Total Score Drug 1: _____

Total Score Drug 2: _____

Total Score Drug 3: _____

Total Score Drug: 4 _____

F. Community violence exposure

Sometimes things happen in a neighbourhood which may cause people to be afraid or get hurt. I will be asking you a few questions about such happenings in your neighbourhood.

1a. Have you heard guns being shot in your neighbourhood? Yes No Did not answer

1b. Have you seen someone pull a gun on another person? Yes No Did not answer

1 c. Have you seen a gun in your home? Yes No Did not answer

2.a. Have you seen someone being beaten up? Yes No Did not answer

2.b. Have you seen somebody get stabbed? Yes No Did not answer

2.c. Have you seen somebody get shot? Yes No Did not answer

2.d. Have you seen someone in your home shot or stabbed? Yes No Did not answer

3. a. Have you seen somebody get arrested? Yes No Did not answer

3. b. Have you seen drug deals? Yes No Did not answer

3. c. Have you seen gangs in your neighbourhood? Yes No Did not answer

3.d. Has your house been broken into? Yes No Did not answer

G. Trauma history questionnaire

The following is a series of questions about serious or traumatic life events. These types of events actually occur with some regularity, although we would like to believe they are rare, and they affect how people feel about, react to, and/or think about things subsequently. Knowing about the occurrence of such events, and reactions to them, will help us to develop programs for prevention, education, and other services. The questionnaire is divided into questions covering crime experiences, general disaster and trauma questions, and questions about physical and sexual experiences.

For each event, please indicate (circle) whether it happened, and if it did, the number of times and your approximate age when it happened (give your best guess if you are not sure). Also note the nature of your relationship to the person involved, and the specific nature of the event, if appropriate.

Crime-Related Events

Have you ever experienced this? If yes, how often and what ages?

- | | | | | | |
|----|---|----|-----|-------|-------|
| 1. | Has anyone ever tried to take something directly from you by using force or the threat of force, such as a stick-up or mugging? | No | Yes | _____ | _____ |
| 2. | Has anyone ever attempted to rob you or actually robbed you (i.e. stolen your personal belongings)? | No | Yes | _____ | _____ |
| 3. | Has anyone ever attempted to or succeeded in breaking into your home when you weren't there? | No | Yes | _____ | _____ |

4. Has anyone ever tried to or succeeded in breaking into your home while you were there? No Yes _____

General Disaster and Trauma

5. Have you ever had a serious accident at work, in a car or somewhere else? No Yes _____
 If yes, please specify _____

6. Have you ever experienced a natural disaster such as a tornado, hurricane, flood, major earthquake, etc., where you felt you or your loved ones were in danger of death or injury? No Yes _____
 If yes, please specify _____

7. Have you ever experienced a "man-made" disaster such as a train crash, building collapse, bank robbery, fire, etc., where you felt you or your loved ones were in danger of death or injury? No Yes _____
 If yes, please specify _____

8. Have you ever been exposed to dangerous chemicals or radioactivity that might threaten your health? No Yes _____

9. Have you ever been in any other situation in which you were seriously injured? No Yes _____
 If yes, please specify _____

10. Have you ever been in any other situation in which you feared you might be killed or seriously injured? No Yes _____

 If yes, please specify _____
11. Have you ever seen someone seriously injured or killed? No Yes _____ _____
 If yes, please specify who _____
12. Have you ever seen dead bodies (other than at a funeral) or had to handle dead bodies for any reason? No Yes _____ _____
 If yes, please specify _____
13. Have you ever had a close friend or family member murdered, or killed by a drunk driver? No Yes _____

 If yes, please specify relationship (e.g. mother, grandson, etc.) _____
14. Have you ever had a spouse, romantic partner, or child die? No Yes _____ _____
 If yes, please specify relationship _____
15. Have you ever had a serious or life-threatening illness? No Yes _____ _____
 If yes, please specify _____

16. Have you ever received news of a serious injury, life-threatening illness or unexpected death of someone close to you? No Yes _____

If yes, please indicate _____

17. Have you ever had to engage in combat while in military service in an official or unofficial war zone? No Yes _____

If yes, please indicate where: _____

Physical and Sexual Experiences

18. Has anyone ever made you have intercourse, oral or anal sex against your will? No Yes _____

If yes, please indicate nature of relationship with person (e.g. stranger, friend, relative, parent, sibling) _____

19. Has anyone ever touched private parts of your body, or made you touch theirs, under force or threat? No Yes _____

If yes, please indicate nature of relationship with person (e.g. stranger, friend, relative, parent, sibling) _____

20. Other than incidents mentioned in Questions 18 and 19, have there been any other situations in which another person tried to force you to have unwanted sexual contact? No Yes _____
21. Has anyone, including family members or friends, ever attacked you with a gun, knife or some other weapon? No Yes _____
22. Has anyone, including family members or friends, ever attacked you without a weapon and seriously injured you? No Yes _____
23. Has anyone in your family ever beaten, "spanked" or pushed you hard enough to cause injury? No Yes _____

Other Events

24. Have you experienced any other extraordinarily stressful situation or event that is not covered above? No Yes _____

_____ If yes, please specify. _____

Appendix 2

Cochrane Injuries Group specialised register

((therapy or therapies or interpersonal or psychotherap* or "problem solving" or operant* or reinforcement* or biofeedback* or "social skill" or "social skills" or "cognitive behavioral" or "discussion group" or "discussion groups" or "insight oriented" or "client centred" or counsel* or insight* or paradox* or psychoanalys* or psychodram* or "role play" or "role playing" or transactional or befriend* or mentor* or "social support" or "psychological debrief" or "psychological debriefing" or "motivational interview" or "case management" or (alcohol intervention*)) AND ((accident* or injur* or trauma* or wound* or bleed* or rupture* or scald* or asphyxia* or drown* or burn* or poison* or stab* or shot* or shoot* or gunshot or lacerat* or shock* or electrocut* or wound* or trauma* or injur* or oedema* or edema* or damag* accident* or uninten* or intoxicat* or poison* or violence or violent or alcohol drink* or alcohol problem* or alcohol consumption or alcohol complication*)) AND ((emergency or trauma or accident) and (hospital* or accident or center*)) AND (INREGISTER) [REFERENCE] [STANDARD]

Cochrane Central Register of Controlled Trials (CENTRAL, *The Cochrane Library*)

#1MeSH descriptor: [Psychotherapy] explode all trees

#2MeSH descriptor: [Counseling] explode all trees

#3(psychosocial or psycho-social):ti,ab,kw (Word variations have been searched)

#4((behavior* or behaviour* or family or families or cognitive or psycho*) near/3 (therapy or therapies)):ti,ab,kw (Word variations have been searched)

#5(interpersonal or psychotherap* or "problem solving" or operant* or reinforcement* or biofeedback* or "social skill" or "social skills" or "cognitive behavioral" or "discussion group" or "insight oriented" or "client centered" or counsel* or insight* or paradox* or psychoanalys* or psychodrama* or "role play" or "role playing" or transactional or befriend* or mentor* or "social

support"):ti,ab,kw (Word variations have been searched)

#6(psychological near/1 debrief*):ti,ab,kw (Word variations have been searched)

#7interview*:ti,ab,kw (Word variations have been searched)

#8(discussion near/1 group*):ti,ab,kw (Word variations have been searched)

#9motivational interview*:ti,ab,kw (Word variations have been searched)

#10(social near/1 support):ti,ab,kw (Word variations have been searched)

#11MeSH descriptor: [Interview, Psychological] explode all trees

#12(Interview* near/1 (motivational or brief)):ti,ab,kw (Word variations have been searched)

#13case management:ti,ab,kw (Word variations have been searched)

#14(alcohol* near/3 intervention*):ti,ab,kw (Word variations have been searched)

#15#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14

#16MeSH descriptor: [Accidents] explode all trees

#17MeSH descriptor: [Abdominal Injuries] explode all trees

#18MeSH descriptor: [Accidental Falls] explode all trees

#19MeSH descriptor: [Asphyxia] explode all trees

#20MeSH descriptor: [Burns] explode all trees

#21MeSH descriptor: [Drowning] explode all trees

#22MeSH descriptor: [Esophagus] explode all trees and with qualifiers: [Injuries - IN]

#23MeSH descriptor: [Eye Injuries] explode all trees

#24MeSH descriptor: [Eye Burns] explode all trees

#25MeSH descriptor: [Lacerations] explode all trees

#26MeSH descriptor: [Multiple Trauma] explode all trees

#27MeSH descriptor: [Near Drowning] explode all trees

#28MeSH descriptor: [Rib Fractures] explode all trees

#29MeSH descriptor: [Rupture] explode all trees

#30MeSH descriptor: [Shock, Hemorrhagic] explode all trees

#31MeSH descriptor: [Shock, Traumatic] explode all trees

- #32MeSH descriptor: [Thoracic Injuries] explode all trees
- #33MeSH descriptor: [Trauma, Nervous System] explode all trees
- #34MeSH descriptor: [Trauma Severity Indices] explode all trees
- #35MeSH descriptor: [Wounds, Penetrating] explode all trees
- #36MeSH descriptor: [Wounds, Nonpenetrating] explode all trees
- #37MeSH descriptor: [Wounds, Stab] explode all trees
- #38MeSH descriptor: [Wounds, Gunshot] explode all trees
- #39((abdom* or chest or thora* or torso) near/5 (wound* or trauma* or injur* or oedema* or edema* or damag*)):ti,ab,kw (Word variations have been searched)
- #40((ingest* or drink* or eat* or ate or swallow*) near/5 (accident* or uninten* or intoxicat* or poison*)):ti,ab,kw (Word variations have been searched)
- #41(accident* or injur* or trauma* or wound* or bleed* or rupture* or scald* or asphyxia* or drown* or burn* or poison* or stab* or shot* or shoot* or gun?shot or gunshot or lacerat* or shock* or electrocut*):ti (Word variations have been searched)
- #42((indust* or occupation*) near/3 (accident* or injur*)):ti,ab,kw (Word variations have been searched)
- #43MeSH descriptor: [Violence] explode all trees and with qualifiers: [Prevention & control - PC, Statistics & numerical data - SN]
- #44MeSH descriptor: [Domestic Violence] explode all trees and with qualifiers: [Prevention & control - PC, Statistics & numerical data - SN]
- #45alcohol drinking:ti,ab,kw (Word variations have been searched)
- #46MeSH descriptor: [Alcohol Drinking] explode all trees and with qualifiers: [Adverse effects - AE]
- #47MeSH descriptor: [Alcohol Drinking] explode all trees and with qualifiers: [Epidemiology - EP]
- #48MeSH descriptor: [Alcoholism] explode all trees
- #49MeSH descriptor: [Substance-Related Disorders] explode all trees and with qualifiers: [Epidemiology - EP]

#50MeSH descriptor: [Aggression] explode all trees and with qualifiers: [Drug effects - DE]

#51(alcohol* near/3 (consumption or drink* or problem*)):ti,ab,kw (Word variations have been searched)

#52(alcohol* near/3 complication*):ti,ab,kw (Word variations have been searched)

#53#16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36 or #37 or #38 or #39 or #40 or #41 or #42 or #43 or #44 or #45 or #46 or #47 or #48 or #49 or #50 or #51 or #52

#54#15 and #53

#55MeSH descriptor: [Case Management] explode all trees and with qualifiers: [Organization & administration - OG]

#56MeSH descriptor: [Directive Counseling] explode all trees and with qualifiers: [Organization & administration - OG]

#57MeSH descriptor: [Needs Assessment] explode all trees and with qualifiers: [Organization & administration - OG]

#58MeSH descriptor: [Referral and Consultation] explode all trees and with qualifiers: [Organization & administration - OG, Statistics & numerical data - SN]

#59MeSH descriptor: [Emergency Service, Hospital] explode all trees and with qualifiers: [Organization & administration - OG, Statistics & numerical data - SN]

#60MeSH descriptor: [Trauma Centers] explode all trees and with qualifiers: [Organization & administration - OG, Statistics & numerical data - SN]

#61MeSH descriptor: [Emergency Service, Hospital] explode all trees

#62#55 or #56 or #57 or #58 or #59 or #60 or #61

#63#54 and #62

Ovid MEDLINE(R), Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid OLDMEDLINE(R)

1. exp Psychotherapy/
2. exp Counseling/

3. (psychosocial or psycho-social).mp.
4. ((behavior* or behaviour* or family or families or cognitive or psycho*) adj3 (therapy or therapies)).ti,ab.
5. (interpersonal or psychotherap* or "problem solving" or operant* or reinforcement* or biofeedback* or "social skill" or "social skills" or "cognitive behavioral" or "discussion group" or "insight oriented" or "client centered" or counsel* or insight* or paradox* or psychoanalys* or psychodrama* or "role play" or "role playing" or transactional or befriend* or mentor* or "social support").ti,ab.
6. (psychological adj1 debrief*).ti,ab.
7. "interview*".ab,ti.
8. (discussion adj1 group*).ti,ab.
9. "motivational interview*".ab,ti.
10. (social adj1 support).ab,ti.
11. exp Interview, Psychological/
12. (Interview* adj1 (motivational or brief)).ab,ti.
13. case management.ab,ti.
14. (alcohol* adj3 intervention*).ab,ti.
15. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14
16. exp Accidents/
17. exp abdominal injuries/
18. exp Accidental falls/
19. exp Asphyxia/
20. exp Burns/
21. exp Drowning/
22. exp Esophagus/in [Injuries]
23. exp Eye Injuries/
24. exp Eye Burns/
25. exp Lacerations/
26. exp Multiple Trauma/

27. exp Near Drowning/
28. exp Rib Fractures/
29. exp Rupture/
30. exp Shock, hemorrhagic/
31. exp Shock, traumatic/
32. exp Thoracic injuries/
33. exp Trauma, nervous system/
34. exp Trauma severity indices/
35. exp Wounds, penetrating/
36. exp Wounds, nonpenetrating/
37. exp Wounds, stab/
38. exp Wounds, gunshot/
39. ((abdom* or chest or thora* or torso) adj5 (wound* or trauma* or injur* or oedema* or edema* or damag*)).ab,ti.
40. ((ingest* or drink* or eat* or ate or swallow*) adj5 (accident* or uninten* or intoxicat* or poison*)).ab,ti.
41. (accident* or injur* or trauma* or wound* or bleed* or rupture* or scald* or asphyxia* or drown* or burn* or poison* or stab* or shot* or shoot* or gun?shot or gunshot or lacerat* or shock* or electrocut*).ti.
42. ((indust* or occupation*) adj3 (accident* or injur*)).ab,ti.
43. exp Violence/pc, sn [Prevention & Control, Statistics & Numerical Data]
44. exp Domestic Violence/pc, sn [Prevention & Control, Statistics & Numerical Data]
45. alcohol drinking.ab,ti.
46. exp Alcohol Drinking/ae [Adverse Effects]
47. exp Alcohol Drinking/ep [Epidemiology]
48. exp Alcoholism/
49. exp Substance-Related Disorders/ae, ep [Adverse Effects, Epidemiology]
50. exp Aggression/de, ep [Drug Effects, Epidemiology]
51. (alcohol* adj3 (consumption or drink* or problem*)).ab,ti.

52. (alcohol* adj3 complication*).ab,ti.
53. 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52
54. 15 and 53
55. exp Case Management/og [Organization & Administration]
56. exp Directive Counseling/og [Organization & Administration]
57. exp Needs Assessment/og [Organization & Administration]
58. exp "Referral and Consultation"/og, sn [Organization & Administration, Statistics & Numerical Data]
59. Emergency Service, Hospital/og, sn [Organization & Administration, Statistics & Numerical Data]
60. Trauma Centers/og, sn [Organization & Administration, Statistics & Numerical Data]
61. *Emergency Service, Hospital/
62. 55 or 56 or 57 or 58 or 59 or 60 or 61
63. 54 and 62
64. randomi?ed.ab,ti.
65. randomized controlled trial.pt.
66. controlled clinical trial.pt.
67. placebo.ab.
68. clinical trials as topic.sh.
69. randomly.ab.
70. trial.ti.
71. 64 or 65 or 66 or 67 or 68 or 69 or 70
72. (animals not (humans and animals)).sh.
73. 71 not 72
74. 63 and 73

EMBASE Classic + EMBASE (OvidSP)

1. exp psychotherapy/
2. exp counseling/
3. (psychosocial or psycho-social).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
4. ((behavior* or behaviour* or family or families or cognitive or psycho*) adj3 (therapy or therapies)).ti,ab.
5. (interpersonal or psychotherap* or "problem solving" or operant* or reinforcement* or biofeedback* or "social skill" or "social skills" or "cognitive behavioral" or "discussion group" or "insight oriented" or "client centered" or counsel* or insight* or paradox* or psychoanalys* or psychodrama* or "role play" or "role playing" or transactional or befriend* or mentor* or "social support").ti,ab.
6. (psychological adj1 debrief*).ti,ab.
7. "interview*".ab,ti.
8. (discussion adj1 group*).ti,ab.
9. "motivational interview*".ab,ti.
10. (social adj1 support).ab,ti.
11. exp psychologic test/
12. (Interview* adj1 (motivational or brief)).ab,ti.
13. case management.ab,ti.
14. (alcohol* adj3 intervention*).ab,ti.
15. or/1-14
16. exp accident/
17. exp abdominal injury/
18. exp falling/
19. exp asphyxia/
20. exp burn/
21. exp drowning/

22. exp eye injury/
23. exp esophagus injury/
24. eye burn/
25. exp laceration/
26. exp multiple trauma/
27. exp near drowning/
28. exp rib fracture/
29. exp rupture/
30. exp hemorrhagic shock/
31. exp traumatic shock/
32. exp thorax injury/
33. exp nervous system injury/
34. exp injury scale/
35. exp penetrating trauma/
36. exp blunt trauma/
37. exp stab wound/
38. exp gunshot injury/
39. ((abdom* or chest or thora* or torso) adj5 (wound* or trauma* or injur* or oedema* or edema* or damag*)).ab,ti.
40. ((ingest* or drink* or eat* or ate or swallow*) adj5 (accident* or uninten* or intoxicat* or poison*)).ab,ti.
41. (accident* or injur* or trauma* or wound* or bleed* or rupture* or scald* or asphyxia* or drown* or burn* or poison* or stab* or shot* or shoot* or gun?shot or gunshot or lacerat* or shock* or electrocut*).ti.
42. ((indust* or occupation*) adj3 (accident* or injur*)).ab,ti.
43. violence/pc [Prevention]
44. domestic violence/ or partner violence/
45. alcohol drinking.ab,ti.
46. exp drinking behavior/ep [Epidemiology]

- 47. exp alcoholism/
- 48. exp addiction/ep, si [Epidemiology, Side Effect]
- 49. exp aggression/ep [Epidemiology]
- 50. (alcohol* adj3 (consumption or drink* or problem*)).ab,ti.
- 51. (alcohol* adj3 complication*).ab,ti.
- 52. or/16-51
- 53. 15 and 52
- 54. exp case management/
- 55. exp directive counseling/
- 56. exp needs assessment/
- 57. exp emergency health service/
- 58. exp emergency health service/
- 59. *Emergency Service, Hospital/
- 60. or/54-59
- 61. 53 and 60
- 62. exp Randomized Controlled Trial/
- 63. exp controlled clinical trial/
- 64. randomi?ed.ab,ti.
- 65. placebo.ab.
- 66. Clinical Trial/
- 67. randomly.ab.
- 68. trial.ti.
- 69. or/62-68
- 70. exp animal/ not (exp human/ and exp animal/)
- 71. 69 not 70
- 72. 61 and 71

CINAHL Plus (EBSCO)

S67 S55 AND S66

S66 S56 or S57 or S58 or S59 or S60 or S61 or S62 or S63 or S64 or S65

S65 MH quantitative studies
S64 TX random* N3 allocat*
S63 (MH "Random Assignment")
S62 TX placebo*
S61 (MH "Placebos")
S60 TX randomi?ed N3 control* N3 trial*
S59 TI ((singl* N3 blind*) or (doubl* N3 blind*) or (trebl* N3 blind*) or (tripl* N3 blind*)) or TI ((singl* N3 mask*) or (doubl* N3 mask*) or (trebl* N3 mask*) or (tripl* N3 mask*)) or AB ((singl* N3 blind*) or (doubl* N3 blind*) or (trebl* N3 blind*)) or AB ((singl* N3 mask*) or (doubl* N3 mask*) or (trebl* N3 mask*) or (tripl* N3 mask*))
S58 TX clinical N3 trial*
S57 PT clinical trial*
S56 (MH "Clinical Trials")
S55 S49 AND S54
S54 S50 OR S51 OR S52 OR S53
S53 (MH "Emergency Medical Services+")
S52 (MH "Referral and Consultation+")
S51 (MH "Needs Assessment")
S50 (MH "Case Management") S
S49 S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR
S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR
S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46 OR
S47 OR S48
S48 (alcohol* N3 complication*)
S47 (alcohol* N3 (consumption or drink* or problem*))
S46 (MH "Aggression+/DE/EP")
S45 (MH "Substance Use Disorders+")
S44 (MH "Alcoholism")

S43 (MH "Alcohol Drinking/EP/DE")
S42 alcohol drinking
S41 (MH "Domestic Violence+/PC")
S40 (MH "Violence+/PC")
S39 ((indust* or occupation*) N3 (accident* or injur*))
S38 (accident* or injur* or trauma* or wound* or bleed* or rupture* or scald* or asphyxia* or drown* or burn* or poison* or stab* or shot* or shoot* or gun?shot or gunshot or lacerat* or shock* or electrocut*)
S37 ((ingest* or drink* or eat* or ate or swallow*) N5 (accident* or uninten* or intoxicat* or poison*))
S36 ((abdom* or chest or thora* or torso) N5 (wound* or trauma* or injur* or oedema* or edema* or damag*))
S35 (MH "Wounds, Gunshot")
S34 (MH "Wounds, Stab+")
S33 (MH "Wounds, Nonpenetrating+")
S32 (MH "Wounds, Penetrating+")
S31 (MH "Trauma Severity Indices+")
S30 (MH "Thoracic Injuries+")
S29 (MH "Shock, Traumatic+")
S28 (MH "Shock, Hemorrhagic")
S27 (MH "Rupture+")
S26 (MH "Rib Fractures")
S25 (MH "Near Drowning")
S24 (MH "Multiple Trauma")
S23 (MH "Tears and Lacerations+")
S22 (MH "Eye Injuries+")
S21 (MH "Esophagus/IN")
S20 (MH "Drowning+")
S19 (MH "Burns+")

S18 (MH "Asphyxia")

S17 (MH "Accidental Falls")

S16 (MH "Abdominal Injuries+")

S15 (MH "Accidents+")

S14 AB alcohol* N3 intervention* or TI alcohol* N3 intervention*

S13 AB case management or TI case management

S12 AB(Interview* N1 (motivational or brief)) or TI(Interview* N1 (motivational or brief))

S11 (MH "Diagnosis, Psychosocial+")

S10 AB (social N1 support) or TI (social N1 support)

S9 AB "motivational interview*" or TI "motivational interview*"

S8 AB (discussion N1 group*) or TI (discussion N1 group*)

S7 AB interview* or TI interview*

S6 AB(psychological N1 debrief*) or TI(psychological N1 debrief*)

S5 AB(interpersonal or psychotherap* or "problem solving" or operant* or reinforcement* or biofeedback* or "social skill" or "social skills" or "cognitive behavioral" or "discussion group" or "insight oriented" or "client centered" or counsel* or insight* or paradox* or psychoanalys* or psychodrama* or "role play" or "role playing" or transactional or befriend* or mentor* or "social support") or TI(interpersonal or psychotherap* or "problem solving" or operant* or reinforcement* or biofeedback* or "social skill" or "social skills" or "cognitive behavioral" or "discussion group" or "insight oriented" or "client centered" or counsel* or insight* or paradox* or psychoanalys* or psychodrama* or "role play" or "role playing" or transactional or befriend* or mentor* or "social support")

S4 AB((behavior* or behaviour* or family or families or cognitive or psycho*) n3 (therapy or therapies)) or TI ((behavior* or behaviour* or family or families or cognitive or psycho*) n3 (therapy or therapies))

S3 (psychosocial or psycho-social)

S2 (MH "Counseling+")

S1 (MH "Psychotherapy+")

PsycINFO (OvidSP)

1. exp Psychotherapy/
2. exp Counseling/
3. (psychosocial or psycho-social).mp.
4. ((behavior* or behaviour* or family or families or cognitive or psycho*) adj3 (therapy or therapies)).ti,ab.
5. (interpersonal or psychotherap* or "problem solving" or operant* or reinforcement* or biofeedback* or "social skill" or "social skills" or "cognitive behavioral" or "discussion group" or "insight oriented" or "client centered" or counsel* or insight* or paradox* or psychoanalys* or psychodrama* or "role play" or "role playing" or transactional or befriend* or mentor* or "social support").ti,ab.
6. (psychological adj1 debrief*).ti,ab.
7. "interview*".ab,ti.
8. (discussion adj1 group*).ti,ab.
9. "motivational interview*".ab,ti.
10. (social adj1 support).ab,ti.
11. (Interview* adj1 (motivational or brief)).ab,ti.
12. case management.ab,ti.
13. (alcohol* adj3 intervention*).ab,ti.
14. exp psychological assessment/
15. or/1-14
16. exp Accidents/
17. anoxia/
18. exp Burns/
19. exp Esophagus/
20. shock/
21. exp injuries/

22. ((abdom* or chest or thora* or torso) adj5 (wound* or trauma* or injur* or oedema* or edema* or damag*)).ab,ti.
23. ((ingest* or drink* or eat* or ate or swallow*) adj5 (accident* or uninten* or intoxicat* or poison*)).ab,ti.
24. (accident* or injur* or trauma* or wound* or bleed* or rupture* or scald* or asphyxia* or drown* or burn* or poison* or stab* or shot* or shoot* or gun?shot or gunshot or lacerat* or shock* or electrocut*).ti.
25. ((indust* or occupation*) adj3 (accident* or injur*)).ab,ti.
26. exp Domestic Violence/ or exp Intimate Partner Violence/
27. alcohol drinking.ab,ti.
28. alcohol abuse/ or alcoholism/
29. exp Drug Abuse/
30. exp Aggressive Behavior/
31. (alcohol* adj3 (consumption or drink* or problem*)).ab,ti.
32. (alcohol* adj3 complication*).ab,ti.
33. or/16-32
34. 15 and 33
35. exp Case Management/
36. exp Needs Assessment/
37. hospitals/
38. ((hospital* adj3 emergency) or (accident adj1 emergency) or (trauma adj3 center*)).tw.
39. or/35-38
40. 34 and 39
41. exp clinical trials/
42. exp placebo/
43. exp treatment effectiveness evaluation/
44. exp mental health program evaluation/
45. exp experimental design/

- 46. exp prospective studies/
- 47. clinical trial*.ab,ti.
- 48. controlled clinical trial.ab,ti.
- 49. randomi?ed controlled trial.ab,ti.
- 50. randomi?ed.ab,ti.
- 51. placebo.ab.
- 52. randomly.ab.
- 53. trial.ti.
- 54. ((singl* or doubl* or trebl* or tripl*) adj3 (blind* or dummy or mask*)).ab,ti.
- 55. ((crossover or clin* or control* or compar* or evaluat* or prospectiv*) adj3 (trial* or studi* or study)).ab,ti.
- 56. 41 or 42 or 43 or 44 or 45 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55
- 57. exp animals/
- 58. exp human females/
- 59. exp human males/
- 60. 58 or 59
- 61. 57 not (57 and 60)
- 62. 56 not 61
- 63. 40 and 62

ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED) & Conference Proceedings Citation Index- Science (CPCI-S)

- #30 #29 AND #23
- #29 #28 AND #27
- #28 TS=(human*)
- #27 #26 OR #25 OR #24
- #26 TS=((singl* OR doubl* OR trebl* OR tripl*) SAME (blind* OR mask*))
- #25 TS=(controlled clinical trial OR controlled trial OR clinical trial OR placebo)
- #24 TS=(randomised OR randomized OR randomly OR random order OR random sequence OR random allocation OR randomly allocated OR at random OR

randomized controlled trial)

#23 #22 AND #21

#22 TS=(((hospital* near/3 emergency) or (accident near/1 emergency) or ((trauma or emergency) near/3 center*)))

#21 #20 AND #12

#20 #19 OR #18 OR #17 OR #16 OR #15 OR #14 OR #13

#19 TS=((alcohol* near/3 complication*))

#18 TS=((alcohol* near/3 (consumption or drink* or problem*)))

#17 TS=("alcohol drinking")

#16 TS=(((indust* or occupation*) near/3 (accident* or injur*)))

#15 Title=((accident* or injur* or trauma* or wound* or bleed* or rupture* or scald* or asphyxia* or drown* or burn* or poison* or stab* or shot* or shoot* or gun?shot or gunshot or lacerat* or shock* or electrocut*))

#14 TS=(((ingest* or drink* or eat* or ate or swallow*) near/5 (accident* or uninten* or intoxicat* or poison*)))

#13 TS=(((abdom* or chest or thora* or torso) near/5 (wound* or trauma* or injur* or oedema* or edema* or damag*)))

#12 #11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1

#11 TS=((alcohol* near/3 intervention*))

#10 TS=("case management")

#9 TS=((Interview* near/1 (motivational or brief)))

#8 TS=((social near/1 support))

#7 TS=("motivational interview*")

#6 TS=((discussion near/1 group*))

#5 TS=("interview*")

#4 TS=((psychological near/1 debrief*))

#3 TS=((interpersonal or psychotherap* or "problem solving" or operant* or reinforcement* or biofeedback* or "social skill" or "social skills" or "cognitive behavioral" or "discussion group" or "insight oriented" or "client centered" or

counsel* or insight* or paradox* or psychoanalys* or psychodrama* or "role play"
or "role playing" or transactional or befriend* or mentor* or "social support")
#2 Topic=(((behavior* or behaviour* or family or families or cognitive or psycho*)
near/3 (therapy or therapies)))
#1 TS=((psychosocial or psycho-social))