Evaluating the Effectiveness of Mental Health Training on the Knowledge and Attitudes of Non-Specialist Health Workers in South Africa

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DECLARATION

I, ***Mpho Mahlakametsa***, hereby declare that the work on which this dissertation/thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

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Glossary of Abbreviations
CAMI - Community Attitudes Towards the Mentally Ill Scale.
CHW – Community health worker.
CMD – Common mental disorder.
GBD – Global burden of disease.
HAST counsellor – HIV/AIDS, sexually transmitted infections, tuberculosis counsellor.
HIV/AIDS – Human Immunodeficiency Virus/Acquired Immune Deficiency Virus.
LMIC – Low- and middle-income countries.
MAKS – Mental Health Knowledge Schedule.
NSHW - Non-specialist health worker.
SASH – South African stress and health study.
TB – Tuberculosis.
WHO – World Health Organization.
YLD – Years lived with disability.

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Abstract

Background

Mental disorders have a considerable impact on the rates of disability in the world. Economic data have consistently shown that the indirect losses resulting from poorly managed mental disorders continue to outstrip countries' health budgets. Given a significant shortage of health care professionals in low-and middle-income countries, particularly for mental health, and the unequal distribution of resources, a task-shifting approach has been proposed to broaden access to services using less specialised health care providers and reduce the treatment gap resulting from a shortage of human resources. The study observations have shown that this as a feasible option that may improve mental health outcomes. This study expanded on a pilot intervention study carried out by Sibeko and colleagues, which demonstrated that mental health training offered to non-specialised health workers' (NSHW) in the Western Cape province of South Africa had a positive impact on their knowledge, confidence, and attitudes.

Method

This study analysed data collected as part of routine programmatic data collection of mental health training provided to 344 NSHW in various centres across South Africa. The mental health knowledge schedule and community attitudes towards mental illness tests were administered before and after the training was provided. The test scores were analysed using regression models to determine which of the demographic characteristics had an impact in the scores.

Results

Seventy one percent of the training recipients were women, with 97% of them with a minimum education level of grade 8 or higher. The median age was 36, with the median duration of working as a NSHW of six years.

There was an overall statistically significant increase in the knowledge score (pre-training median 43, post-training median 46, p-value < 0.01). nearly 90% recipients showed an openness to living next to individuals with mental illness. Following training, the recipients were less likely to report that people suffering from mental disorders were threatening. There only statistically significant change in attitude scores was in the social restrictiveness subscale (pre-training median 28, post-training median, 27 p-value <0.01).

Conclusion

The training provided to the NSHW improved their knowledge and attitude scores, in keeping with the original study. We recommend continued training to upskill this cadre of health workers to enhance the screening, early recognition of, and intervention of mental disorders.

Keywords: mental health training, non-specialist health workers, knowledge, attitudes.

Background

Mental disorders are clinical conditions that affect emotion, thought and behaviour (1). A complex interaction of genetics, neurochemical and neurocircuitry dysfunction as well as psychosocial factors such as poor attachment, adverse life events in childhood and poverty contribute towards the development of mental disorders (2-4).

The burden of mental illnesses

Mental disorders are a significant contributor of disability in the world, making up 18.7% of all global years lived with disability (YLD) (5). This impacts significantly on the global and local economy (6, 7).

The South African Stress and Health (SSH) study was published in 2008 and is the most recent representative national prevalence study for common mental disorders (CMD) (8). It estimated a twelve-month prevalence of CMD such as anxiety disorder, mood disorders and substance use disorders (SUD) to be 16.5%, with the lifetime prevalence of any CMD being reported at 30%. Mental disorders also have a high rate of co-occurrence with other mental disorders and other conditions such as cardiovascular disease, diabetes, and HIV/AIDS (9-11).

The economic analysis emphasizes that neglecting mental disorders has serious socioeconomic consequences. Lund et al. (7), estimate a USD3.6 billion indirect loss to the South African economy due to severe depressive and anxiety disorders alone. Indirect costs are the effects of having a mental disorder and include absence from work, disability, loss of income, early retirement, or death (6). South Africans diagnosed with a mental disorder have been noted to take 23.6 out of role days a year (9).

Resource allocation within the South African mental health system

South Africa has many constraints impacting on the delivery of mental health services as observed in other low- and middle-income countries (LMIC) (12). A significant portion of the population, approximately 84% is uninsured and depends on the public health facilities for provision on mental health services. This is in part responsible disparity of services between the public (uninsured) and private (insured) sectors (12, 13).

In line with global trends, South Africa's mental health workforce is dominated by nurses, accounting 80 per 100 000 uninsured population (12, 14). About 0.31 psychiatrists in the public sector serve 100 000 uninsured South Africans. Similarly, psychologists, occupational therapists and social workers are underrepresented.

South Africa maintains a hospital-based system, wherein 45% of the mental health budget is expended on specialised psychiatric hospitals while 7.9% is utilised on the primary health care level (12).

The constraints illustrated above mean that near 92% of uninsured South Africans with mental disorders do not obtain appropriate care (12). This is a treatment gap, which has been defined as the disparity between the total population of people suffering from a mental disorder and those receiving appropriate care to address it (15). The incorporation of mental health services into primary health care system has been suggested as a possible solution to this treatment gap (15).

Task shifting and task sharing as a strategy to address the treatment gap.

One strategy that has been posited to meet the treatment gap is task sharing, which is defined as the delegation of specific tasks, where appropriate, to less qualified health workers, with sustained supervision and mentoring (16, 17). By improving the capacity of existing health workers, task shifting aims to reduce the strain on service

delivery by making the health system more efficient. Non-specialist health workers (NSHW) have been trained to deliver several health care tasks such as testing for tuberculosis (TB), adherence counselling, and support in the directly observed therapy (DOT) system. At the height of the HIV/AIDS pandemic, task shifting was supported by WHO as “a viable solution for improving health care coverage by making more efficient use of the human resources already available and by quickly increasing capacity while training and retention programs are expanded” (18). Based on the successful outcome of the HIV/AIDS and TB programmes, task shifting has since been adopted to support the management of non-communicable diseases, with a more recent push to include mental health care services (19, 20).

Task shifting is done in parallel with task sharing, which involves sharing tasks, or clinical responsibilities, between specialist and non-specialist health workers. Tasks are not taken away, but services are provided under a structured supervision and mentoring framework.

Task shifting involves the capacitation of non-specialists with knowledge and skills, intending to delegate new responsibilities in a supervised and supported manner. The WHO described four levels through which this can be achieved:

I. Transfer of knowledge, skills and duties between doctors and specialized physicians with non-physician clinicians,

II. non-physician clinicians with nurses,

III. nurses with nursing assistants and community health workers

IV. nursing assistants and community health workers with patients (18).

Studies have consistently shown that task shifting and sharing improves access to care, reduces the health system's cost, and increases efficiency without compromising quality (20, 21).

Non-specialised health workers as a strategy to address treatment gap.

Non-specialised health workers (NSHW) have a long history of providing health services in South Africa (22, 23). This history of non-specialist health workers finds origin in the interventions targeting the spread of malaria in the 1920s and later, more notably at the height of the HIV/AIDS pandemic. NSHW are a cadre of health workers who are employed to provide healthcare at a primary healthcare level (23). They

include general practitioners, general nurses as well as community health workers (CHW).

In South Africa, CHW are defined as health care providers, selected from, provided with training, and tasked with working in the community (24). This cadre of health care worker is responsive to the community's needs, providing invaluable intervention services such as health promotion, detection and/or treating minor ailments (23, 25).

CHW have been pivotal in improving health outcome in LMIC such as South Africa, by increasing accessibility to health care services in resource limited areas, improving the community's attitudes towards good health seeking behaviour and increasing access to family planning, promoting breastfeeding, participation in treatment adherence strategies for HIV/AIDS and tuberculosis (TB) (22, 26, 27). Their role in the mental health sector include provision of psychoeducation, adherence support, supporting psychosocial rehabilitation services, facilitating social re-integration and combating stigma (19, 28).

Capacitating NSHW therefore has the potential to improve access to services in a constrained mental health care system (29). This can be done through task sharing, which involves of clinical responsibilities, between specialist and NSHW (16). Tasks are not taken away, but services are provided under a structured supervision and mentoring framework. Thus, studies have shown that task sharing improves access to care, reduces the health system's cost, and increases efficiency without compromising quality (20, 21).

Knowledge and attitudes of NSHW

Limited knowledge as well as negative perceptions towards mental disorders have been identified as barriers to assessing care (30, 31). Societal stigmatising views of mental disorders have been observed in NSHW. These views include the belief that mental disorders as caused by witchcraft, and/or lack of self-will. A systematic review by Claufeid and colleagues showed that receiving mental health training can better the knowledge and attitudes of NSHW in LMIC (32).

Rationale

This study builds on a pilot study where mental health training was provided to CHW in the Western Cape province of South Africa (33). The study explored changes in knowledge, confidence and attitudes following exposure to the training intervention.

The training programme was facilitated in English, IsiXhosa and Afrikaans by a social worker with previous experience facilitating mental health training for community health workers. Knowledge was evaluated using case vignettes assessing diagnostic areas covered during sessions and measured using Mental Health Knowledge Schedule (MAKS). Attitudes were measured using the Community Attitudes Toward Mental Illness Scale (CAMI), Baseline data were collected at the beginning of the programme and again at the end of the training. The study results showed an improvement in knowledge, evidenced by increased accuracy in diagnosing and the MAKS scores. There was a positive improvement in attitudes in all domains except for authoritarianism. This was postulated to be linked to stigma and the perceived harmfulness of people with mental disorders (quoted in 33, 34, 35).

Aim

This study aims to determine whether mental health training offered to a larger sample of NSHW in South Africa shows a similar positive impact on knowledge and attitudes, as noted in the original pilot work.

Objectives

The study objectives are to:

1. Describe the characteristics of the non-specialist workers who received a mental health training intervention.
2. Compare test scores in attitudes and knowledge of the training recipients before and after the mental health training was provided.
3. Determine which of the training recipients' characteristics may have an impact on changes in attitude and knowledge following exposure to the training intervention.

Hypothesis

We expect that the provision of mental health training would have resulted in positive change in the knowledge and attitudes scores of the NSHW who received training.

Methods

Ethical considerations

The University of Cape Town's Human Research Ethics Committee provided ethical approval for the study (Reference HREC: 834/2020). Only routine deidentified programmatic data was used, as a result there was no risk to the participants. Informed consent was obtained from the training recipients who were informed that the data was being collected as part of programme quality assurance monitoring and may be analysed for research purposes at a later date.

Study design

This is a secondary analysis of before and after cohort programmatic following exposure to a training intervention. The characteristics of the training recipients and the baseline knowledge and attitudes, as collected on the measuring tools described below, were captured before the beginning of the training. The knowledge and attitude scores were again collected on the last day at the conclusion of the training.

Study population and setting

The South Africa HIV Addiction Technology Transfer Centre (ATTC) received funds from the United States' President's Emergency Plan for AIDS Relief (PEPFAR) to provide capacity building to aid NSHW working in high HIV burden areas in South Africa in detecting and managing of mental and substance use disorders. National and Provincial Departments of Health collaborators selected groups of NSHW to receive the mental health training as part of routine Work Integrated Learning. These cadres who received this training were then asked to complete these assessments to facilitate the evaluation of the effectiveness of the training intervention. This is a quantitative study.

Training intervention

The training recipients participated in eight training sessions in various sites across the country including Cape Town, Johannesburg, Pietermaritzburg, Port Shepstone, Mbombela, Durban, Amajuba. This training took place from 26 June 2018 to 06 December 2018. The training was preferred in English. The questionnaires were self-administered, written in English.

A total of 344 training recipients completed the questionnaires. The breakdown according to training centres is as follows

Training dates	Training site	Number of training recipients
26/06/2018 to 29/06/2018	TBHIV Care (Durban)	27
02/07/2018 to 05/07/2018	Regional psychosocial support initiative (Repssi) (Johannesburg)	8
17/07/2018 to 20/07/2018	TBHIV Care (Cape Town)	20
03/08/2018 to 07/09/2018	Denis Hurley (Durban)	44
04/08/2018 to 06/08/2018	TBHIV Care (Pietermaritzburg)	30
13/08/2018 to 16/08/2018	Durban	22
03/09/2018 to 06/09/2018	Umgungundlovu (Pietermartizburg)	42
10/09/2018 to 13/09/2018	Umgungundlovu (Pietermartiburg)	47
17/09/2018 to 20/09/2018	Ugu (Port Shepstone)	29
21/09/2018 to 19/10/2018	TBHIV Care (Cape Town)	22
22/10/2018 to 25/10/2018	Amajuba	43
05/11/2018 to 08/11/2018	Jozini	23
19/11/2018 to 22/11/2018	South African National Council on Alcoholism and Drug Dependence (SANCA) Lowveld (Mbombela)	20

03/12/2018 to 06/12/2018	Lady Michaelis CHC (Cape Town)	20

In terms of inclusion criteria, all the training recipients consented to and completed the questionnaires as the data formed part of routine programme monitoring. Characteristics of the training recipients

The deidentified socio-demographic information of the training recipients was captured as part of routine data capturing during the training intervention. Refer to appendix A for more information.

For the purposes of analysis, age and duration of work as a NSHW was captured in years (rounded off to 31/12/2018). Highest level of education was grouped as: no formal education, primary level (Grade 1-7), secondary level (Grade 8 to 12), tertiary level (Diploma, Degree and Postgraduate qualification) (36). The highest level of education for those participants who completed certificates after Grade 12, was recorded as Grade 12. Relationship status was further grouped as married and not married. The designation of the training recipients was also recorded and analysed.

Measuring tools

The training recipients completed the baseline measures which included the Mental Health Knowledge Schedule (MAKS) to evaluate knowledge and the Community Attitudes towards the Mentally Ill (CAMI) to assess provider attitudes towards people suffering from mental disorders. Both tools are graded on a Likert scale where 1 = strongly disagree, 2 = disagree, 3 = neither agree or disagree/neutral, 4 = agree and 5 = strongly agree. These measures were then repeated at the end of the training. The forms were self-administered. see appendix B and C for respective tools.

The MAKS is made of twelve statements, where the first six states test knowledge on the recognition of and management of mental disorders (37). The statements include people with mental disorders being gainfully employed, the use of medication and psychotherapy to treat mental disorders as well as examining attitudes on recovery. The last six statements measure the level of recognition of different mental conditions (depression, stress, schizophrenia, bipolar disorder, drug addiction and grief). It has been used in LMIC such as Kenya (38) , Ethiopia (31) and China (39).

The CAMI consists of forty statements made of four subscales: authoritarianism; benevolence; social restrictiveness and community mental health ideology. As noted by Taylor and Dear (40), authoritarianism refers to how people living with mental disorders are seen as lesser and incapable of making decisions concerning their wellbeing; benevolence is a “paternalistic, sympathetic view” of people living with mental disorders; social restrictiveness reflects a perceived “threat”; while community mental health ideology measures ideas on favourable reception and societal integration. High authoritarian and social restiveness and low benevolence and community mental health ideology scores are associated with increased stigma and negative attitude (41). The tool has previously been used to measure mental health attitudes in the African setting (42).

The sum of the twelve MAKS statements before and after the training was administered was used for statistical analysis. Similarly, the sum of the four CAMI subscales was for used for analysis.

The median score was used a cut-off to measure adequacy of knowledge and favourability of attitudes.

Statistical analysis

Data was be extracted from the spreadsheets onto a licensed statistical application- R (43). Categorical variables such as gender, highest education level, relationship status, history of medical or mental illness, other or previous employment were summarized as frequency and percentages. Discrete nominal variables, such as age, number of children and dependents, number of people in the household with any medical or mental illness was measured using median and range.

The median scores on each of the twelve items of the MAKS collected before and after the training was provided were calculated. Any score equal and above the median score denotes adequate knowledge. The proportions were summarised into percentages and plotted on a bar chart.

Regarding attitudes, median scores for each of the forty items on the CAMI were calculated. Any score equal and below the median for authoritarianism and social restrictiveness subscales were recorded as favourable attitudes. Similarly, any score equal and above the median score for benevolence and community mental health ideology subscales were recorded as favourable attitudes. Each of the individual items

were recorded as “favourable” and “unfavourable” with corresponding tallies were summarised on a table. This was done for scores before and after the training was provided. The favourability of the four subscales were summarised in percentages and summarised on a graph.

A generalised linear mixed effect model was used to evaluate the effect of the training characteristics on the knowledge and attitude scores after the training. This relationship was assessed using the p-value, where $P < 0.05$ indicates a statistically significant effect.

Results

Characteristics of training recipients

A summary of the demographic characteristics of the training recipients is contained in tables 1 and 2.

The median age of the training recipients was 36, with a gender representation of 70.8% (n=242) females and 23.1 % males (n=79). A majority of the training recipients identified as Black African 83 % (n=284). The proportion of married training recipients was 26.6% as opposed to 72.8% of unmarried training recipients. Half of all the training recipients identified as single.

More than sixty percent of the training recipients had a secondary school level of education (n=234), followed by 15.2% of degree holders (n=52) and those with postgraduate qualifications accounting for 5.8 % (n=20). The remaining 2.7% of the training recipients had a grade 7 level education or less (N= 9).

In considering the listed designations, 51 (14.9%) of the training recipients were identified as HIV/AIDS/sexually transmitted infections/TB (HAST) counsellors, this was followed by 43 (12.6%) facilitators, 32 (9.4%) lay counsellors and 32 (9.4%) community care givers. Of those with professional qualifications, 23 (9.6 %) social workers and 21 (6.1%) nurses were noted. This is summarized in figure 1.

The most common chronic medical illness recorded was hypertension 31% (N= 23), followed by HIV 29% (n=22) and diabetes seven percent (n= five). As seen in figure 2.

Of the 6 training recipients that reported suffering from psychiatric illness, four were recorded as depression while two did not disclose.

	MEDIAN (MIN, MAX)
Age	36 (20, 73)
Number Of Children	2 (0, 9)
Dependant Older Than 18	2 (0, 12)
Dependants Between 5 And 18	2 (0, 9)
Dependants Below 5	1 (0,25)
Dependants With Chronic Medical Illness	1 (0,7)
Dependants With Psychiatric Illness	0 (0, 3)

Table 1: Characteristics of training recipients

	FREQUENCY	PERCENTAGE
Gender		
Male	79	23.1
Female	242	70.8
Missing	21	6.1
Total	342	100
Ethnicity		
Black African	284	83.0
Coloured	19	5.6
White	6	1.8
Indian	2	0.6
Missing	31	9.1

Total	342	100
Highest Level of Education		
None	6	1.8
Grade 1 To 7	3	0.9
Grade 8 To 12	234	68.4
Diploma	27	7.9
Degree	52	15.2
Postgraduate Qualification	20	5.8
Total	342	100
Relationship Status		
Married	91	26.6
Not Married	249	72.8
Missing	2	0.6
Total	342	100
Duration Working as NSHW		
0-5 Years	58	17
6-10 Years	108	31.6
11-15 Years	76	22.2
>16 Years	100	29.2
Own Chronic Medical Illness		
Yes	71	20.8
No	266	77.8

Missing	5	1.5
Total	342	100
Own Psychiatric Illness		
Yes	6	1.8
No	332	97.1
Missing	4	1.2
Total	342	100
Another Job in Addition To NSHW		
Yes	37	10.8
No	297	86.8
Missing	8	2.3
Total	342	100
Other Job Before Starting NSHW		
Yes	185	52.6
No	145	42.4
Missing	17	5
Total	342	100
Retired?		
Yes	19	5.6
No	300	93.3
Missing	23	6.7
Total	342	100

Table 2: Characteristics of training recipients

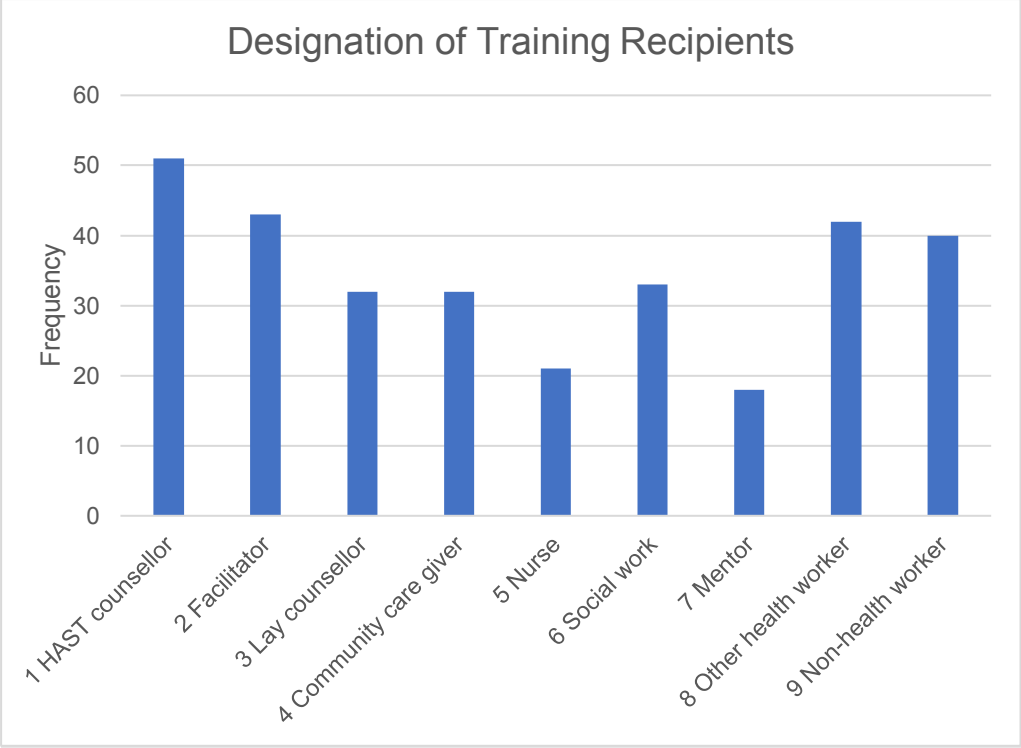

Figure 1: Designation of training recipients

*Community care giver is synonymous with CHW

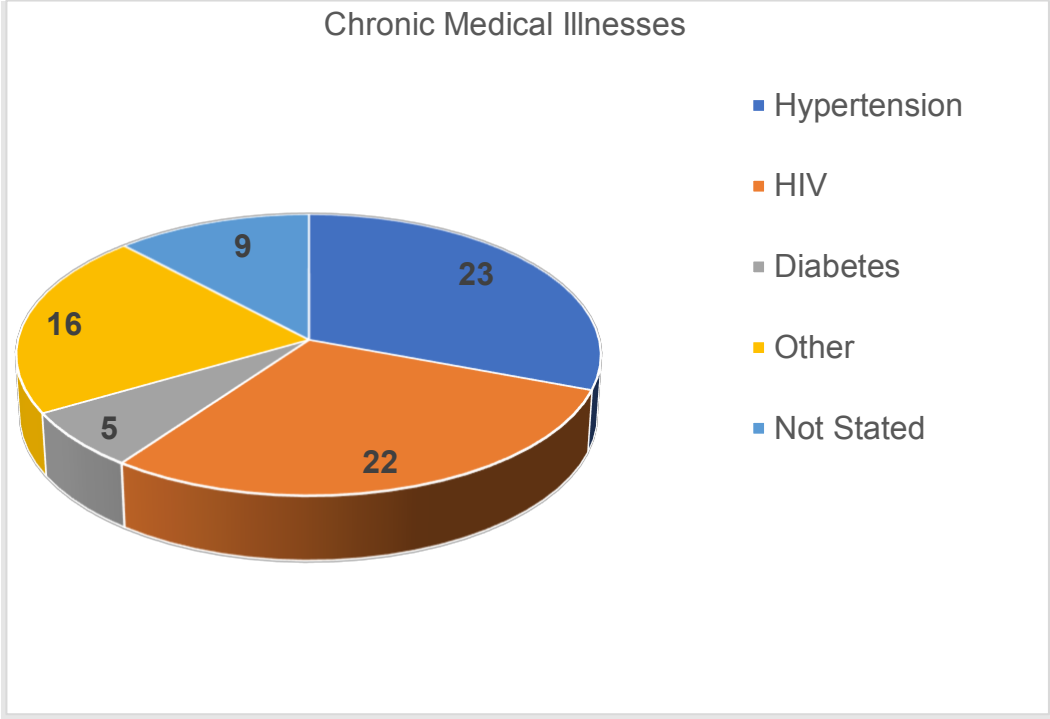

Figure 2: Summary of chronic medical illness

Measure scores

Knowledge

The median knowledge test score increased from 43 before training to 46 after the training (p-value <0.01). This was a statistically significant change.

Overall, more than 53% of the training recipients scored above the median pre-training score while 54.5% score above the median after receiving training. More than half the training recipient displayed adequate at baseline. An increase proportions of recipients with adequate knowledge scores in all statements except for four. The training recipients who believed that people with mental disorders want to be gainfully employed decreased from 61.4% before training to 58.3% after training. Sixty percent of the recipients hold the belief that individuals with severe mental disorders can recuperate completely at the beginning of the training while only 50% believed this to be true after receiving training. Figure 3 shows the knowledge adequacy rates.

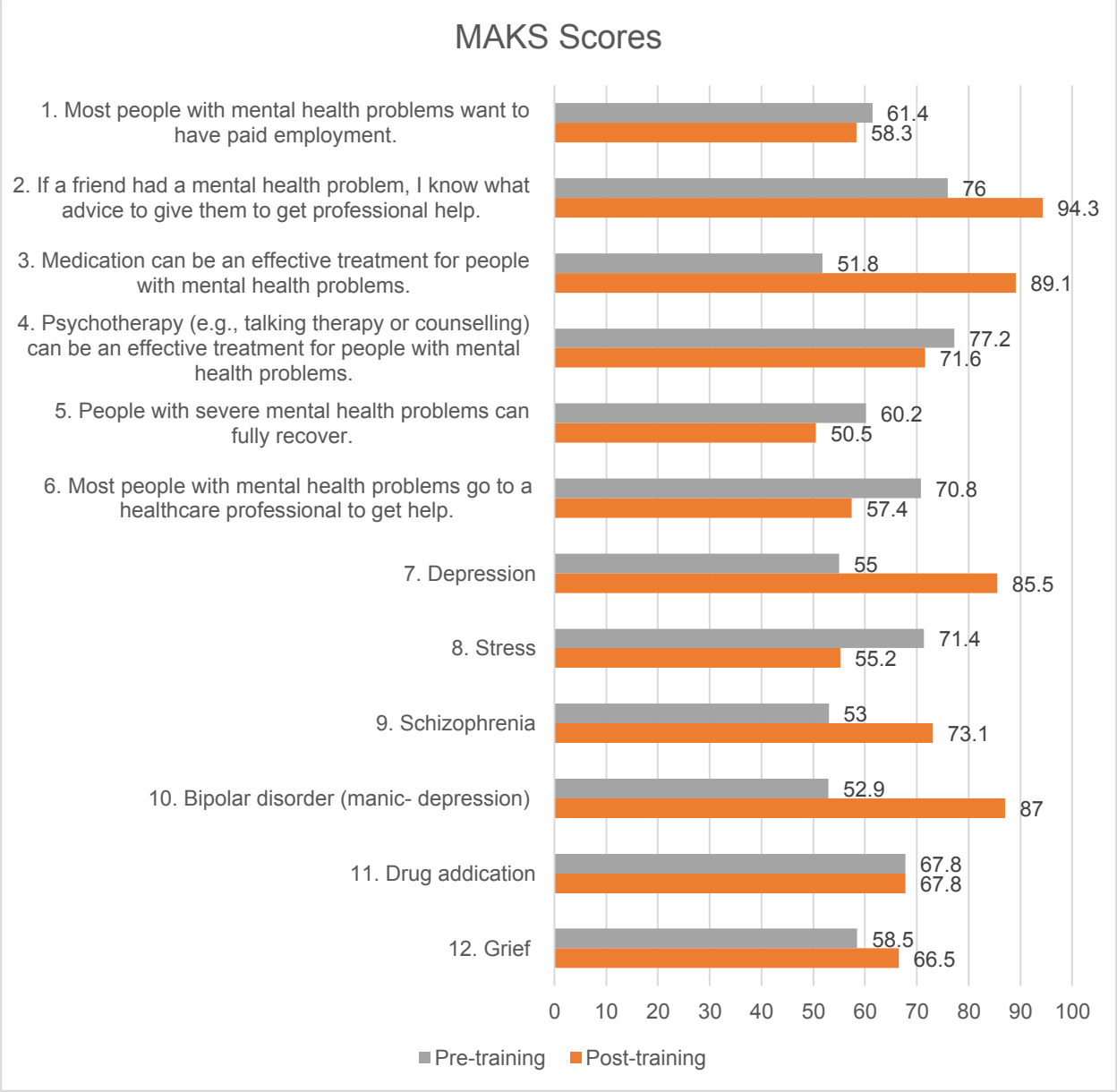

Figure 3: Measurement of adequate knowledge for each MAKS statement

Attitudes

Prior to receiving training, more than eighty percent of the training recipients replied in saying that individuals with mental disorders should not be ostracised by society (n= 282, 82.5%) and did not object to living next to someone living with a mental disorder (n= 305, 89.2%). More than two-thirds of the training recipients thought that people with a mental disorder should be encouraged to take on normal life responsibilities (n=261, 76.3%), and that no individual has the right to engage in practices that exclude people with mental disorders from their community (n= 260, 76%). Furthermore, they noted that the community has the responsibility to provide people with mental

disorders with the best possible care (n=311, 90.9%) and not to be kept behind locked doors (n=253, 74%).

Nearly half of the training recipients found the statement “anyone with a history of mental illness should be excluded from taking public office” favourable (n=177, 51.8%) before receiving training. Following the training, 74,6% (n=247) of the training recipients found it unfavourable. Similarly, while the training recipients found the assertion that mental disorders are caused by an absence of self-discipline to be favourable prior to receiving training (n=297, 86.4%), it was found to be unfavourable (n=239, 72.2%) after receiving training. Another shift was seen where 55.3% (n=189) believed that people with mental disorders are dangerous before receiving training. After training, nearly 65% believed to be untrue. Table 3 summaries the finding of the CAMI below.

When considering other subscale scores, there was no statistically significant change in authoritarian, community mental health ideology and benevolence scores before and after the training was provided (31, p-value 0.97; 28, p-value 0.94 and 31, p-value 0.64 respectively). The median social restrictiveness score went down from 28 before the training to 27 after the training, a statistically significant change, p-value <0.01.

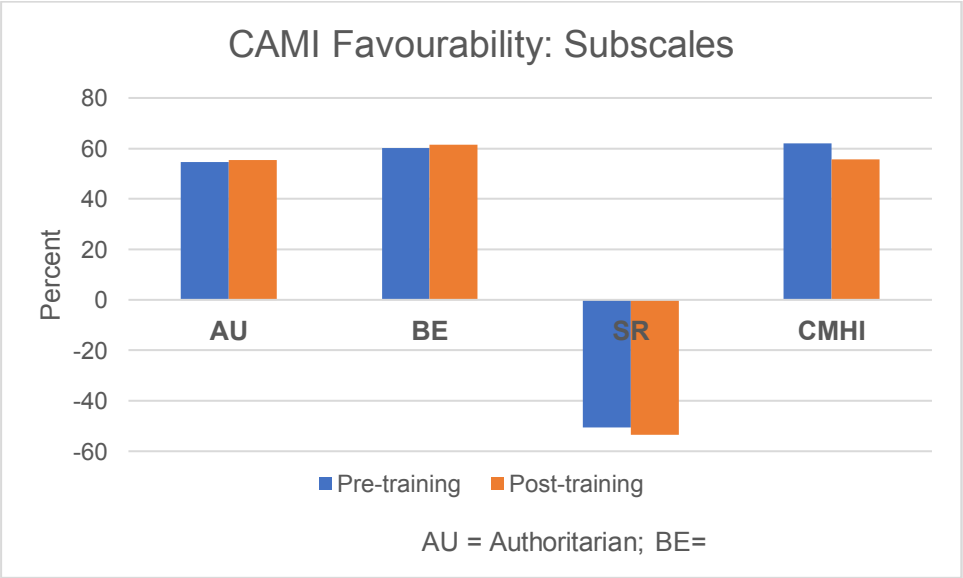

Figure 4: Summary of favourability of each CAMI subscale

	Pre-training			Post-training		
	Response	Frequency	Percentage	Response	Frequency	Percentage
a) As soon as a person shows signs of mental disturbance, he or she should be hospitalized	Favourable	222	64.9	favourable	201	60.7
b) More tax money should be spent on the care and treatment of adults with mental illness	Favourable	231	67.5	Favourable	222	67.1
c) An adult with mental illness should be kept away (isolated) from the rest of the community	Unfavourable	255	75.2	Unfavourable	305	92.1
d) The best therapy for many adults with mental illness is to be part of a normal community.	Favourable	231	69.0	Favourable	274	82.8
e) Mental illness is an illness like any other	Favourable	183	54.3	Favourable	241	72.8
f) Adults with mental illness are a burden on society.	Unfavourable	228	67.5	Unfavourable	251	75.8
g) Adults with mental illness are far less of a danger than most people think.	Unfavourable	189	55.3	Favourable	214	64.8
h) The presence of mental health facilities like clinics and hospitals in a residential area downgrades the village.	Unfavourable	270	78,9	Unfavourable	270	81.6
i) There is something about adults with mental illness that makes it easy to tell them from normal people.	Favourable	207	60.5	Favourable	197	59.5
j) Adults With Mental Illness Have for Too Long Been the Subjects of Ridicule.	Favourable	172	50.3	Favourable	240	72.5
k) A woman would be foolish to marry a man who has suffered from mental illness, even though he seems fully recovered.	Unfavourable	278	81.3	Unfavourable	282	85.2
l) As far as possible mental health services should be provided through community-based facilities.	Favourable	299	87.7	Favourable	307	93.0
m) Less emphasis should be placed on protecting the public from adults with mental illness.	Favourable	187	54.7	Favourable	173	52.3
n) Spending more on mental health services is a waste of tax money.	Unfavourable	326	95.3	Unfavourable	314	94.9
o) No one has the right to exclude adults with mental illness from their village.	Favourable	260	76.0	Favourable	256	77.3
p) Having adults with mental illness living within a village might be good therapy for them, but the risks to residents are too great.	Favourable	226	66.1	Favourable	183	55.3

q) Adults with mental illness need the same kind of control and discipline as a young child.	Favourable	186	54.4	Favourable	170	51.4
r) We need to adopt a far more tolerant attitude toward adults with mental illness in our society.	Favourable	278	81.3	Favourable	277	83.7
s) I would not want to live next door to someone who has been mentally ill.	Unfavourable	305	89.2	Unfavourable	297	89.7
t) Residents should accept the location of mental health facilities in their village to serve the needs of the local community.	Favourable	310	90.6	Favourable	169	51.1
u) Adults with mental illness should not be treated as outcasts of society.	Favourable	282	82.5	Favourable	261	78.9
v) There are enough existing services for adults with mental illness.	Unfavourable	238	69.6	Unfavourable	219	66.2
w) Adults with mental illness should be encouraged to assume the responsibilities of normal life.	Favourable	261	76.3	Favourable	221	66.8
x) Local residents have good reason to resist (to be against) the location of mental health services in their village.	Unfavourable	253	74.0	Unfavourable	254	77.0
y) The best way to handle adults with mental illness is to keep them behind locked doors.	Unfavourable	253	74.0	Unfavourable	186	56.2
z) Our mental hospitals seem more like prisons than like places where adults with mental illness can be cared for.	Favourable	199	58.2	Favourable	221	66.8
aa) Anyone with a history of mental illness should be excluded from taking public office (like being a ward councillor or town mayor).	Favourable	177	51.8	Unfavourable	247	74.6
bb) Locating mental health services in a village does not endanger local residents.	Favourable	261	76.3	Favourable	224	67.7
cc) Mental hospitals are an out-dated means of treating adults with mental illness	Favourable	251	73.4	Unfavourable	167	50.5
dd) Adults with mental illness do not deserve our sympathy.	Unfavourable	298	87.1	Unfavourable	284	85.8
ee) Adults with mental illness should not be denied their individual rights.	Favourable	249	72.8	Favourable	257	77.6
ff) Mental health facilities should be kept out of residential villages.	Unfavourable	275	80.4	Unfavourable	284	85.8
gg) One of the main causes of mental illness is a lack of self-discipline and will power	Favourable	297	86.8	Unfavourable	239	72.2

hh) We have the responsibility to provide the best possible care for adults with mental illness.	Favourable	311	90.9	Favourable	179	54.1
ii) Adults with mental illness should not be given any responsibility.	Unfavourable	244	71.3	Unfavourable	249	75.2
jj) Residents have nothing to fear from people coming into their village to obtain mental health services.	Favourable	280	81.9	Favourable	267	80.7
kk) Virtually anyone can become mentally ill.	Favourable	287	83.9	Favourable	273	82.5
ll) It is best to avoid anyone who has mental problems.	Unfavourable	257	75.1	Unfavourable	278	84.0
mm)Most women who were once patients in a mental hospital can be trusted as BABYSITTERS.	Favourable	266	77.8	Favourable	224	67.7
nn) It is frightening to think of people with mental problems living in residential village.	Unfavourable	220	64.3	Unfavourable	237	71.6

Table 3: CAMI responses before and after training

Characteristics associated with changes in knowledge scores.

The total MAKS scores were positively influenced by the pre-test scores (p-value < 0.01) and a grade 12 level education (estimate +2.71, p-value <0.01) and the grouped designations of nurses (estimate +2.63, p-value 0.02). Training participants who were identified as mentors were associated with lower knowledge scores, estimate -3.56 (p-value 0.006).

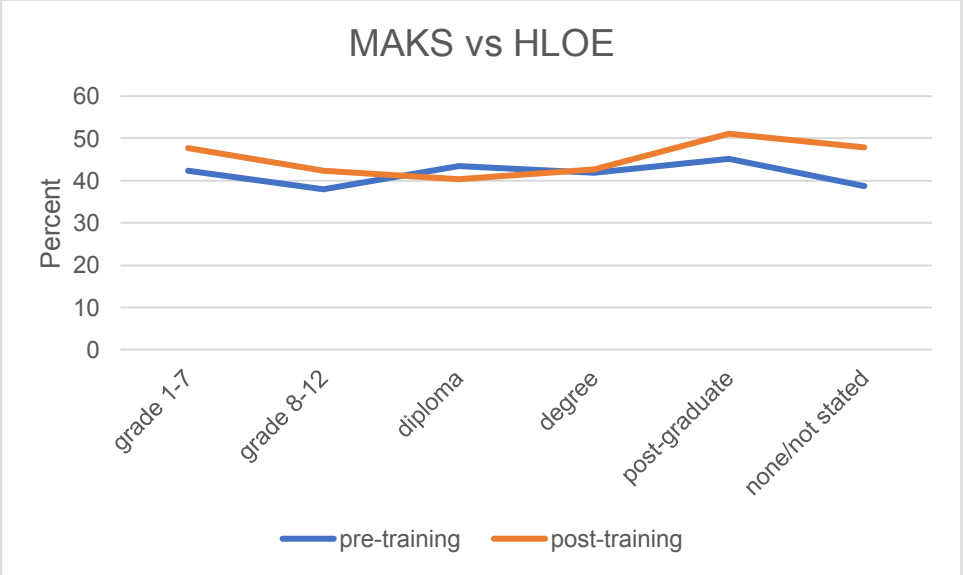

Figure 5: Relationship between highest level of education and MAKS scores

Characteristics associated with changes in attitude.

The significant variables that indicated a decreased in social restrictiveness were the individual pre-test scores 'influence on the post-test scores (estimate -1.06, p-value 0.001) and being unmarried (estimate -1.13, p-value 0.037). However, having dependents above the age of 18 was associated with in an increase in SR (estimate +0.25, p-value 0.025). The following grouped designations were also associated with an increase in social restrictiveness scores- lay counsellor (estimate +1.6, p-value 0.04), nurses (estimate +1.90, p-value 0.04) and mentors (estimate +3.80, p-value 0.0003).

Though the following subscales did not show statistically significant change, the following was observed:

- Authoritarianism: having a tertiary level education was associated with a decreased authoritarianism subscale score (p-value 0.02), while having dependents older than 18 was associated with increased scores (p-value 0.09).
- Benevolence: not being married was associated with a lower benevolence score (p-value 0.02).
- CMHI: having a tertiary education was associated with a decreased CMHI score (p-value 0.02) while having dependents above 18 appeared to be associated with increased scores (0.03).

Measure	**Pre-Training Median (SD)**	**Post-Training Median (SD)**	**p-Value**
Knowledge			
MAKS	43 (7.567)	46 (5.537)	< 0.01
Attitude/CAMI			
Authoritarianism	31 (4.003)	31 (4.231)	0.097
Benevolence	28 (3.592)	28 (3.937)	0.941
Social Restrictiveness (SR)	28 (4.258)	27 (4.191)	<0.01

Community Mental Health Ideology (CHMI)	31 (4.254)	31.(3.999)	0.636

Table 5: Summary of test score results

Discussion

Following delivery of the training intervention, the analysed data demonstrated an improvement in knowledge and a positive shift in attitudes towards mental illness. Per expectation, this mirrors the original findings from the pilot project.

This is the first such study conducted at a national level in our context, looking to understand the influence of a mental health training intervention on the knowledge and attitudes of non-specialist healthcare providers.

The median MAKS score improved from 43 before the training was administered to 46 after the training. More than 53% of the training recipients had adequate baseline knowledge scores which improved with following exposure to the mental health training (54.3%). Adequate knowledge was defined as MAKS scores equal or above the median scores. The improvement in the MAKS scores is similar to those in the original, mean pre-training score 41.48 and post-training mean score of 45.57 (p-value <0.001)(33).

These score results are similar to cross-sectional studies conducted in Ethiopia, Kenya, and an interventional study in Nigeria (31, 38, 44). In a cross-sectional study conducted in the Jima Zone, Ethiopia, Tesfaye and colleagues (31) found that 52.9% of the surveyed health professionals displayed adequate knowledge scores, scoring above the median score of 20 on the MAKS. The Kenyan study (38), noted a median MAKS score of 23.9 while the Nigerian study (44) showed an overall improvement in knowledge scores from a mean score of 60.4% before the provision of mental health training to a mean of 73.6% after the training.

The overall adequacy of the knowledge scores can also be seen in the positive improvements in detection of the following conditions as mental disorders: depression (55% pre-training, 85.5% post-training), schizophrenia (53% pre-training, 73.1% post-training), bipolar disorder (52.9% pre-training, 87% post-training), and grief (58.5% pre-training, 66.5% post-training). There was no change in scores for drug addiction

(67.8) and fewer recipients identified stress as a mental disorder (71.4% pre-training and 55.2% post-training).

In our sample, a more significant increase in knowledge scores was associated with having a secondary level school education. It was interesting that the score changes were only limited to secondary level school education as the original study found that a point improvement in MAKS scores with each increase in highest grade level of education (33). It maybe that differences in study population size and data analysis could account for this discrepancy. Nurses showed an estimated 2.62 knowledge score improvement (p-value <0.02) from baseline post-training knowledge score. A descriptive study by Dube and Uys (45) surveying primary care nurses in South Africa found that nurses had an overall inadequate knowledge in caring for people with mental disorders (average 2.8 in reverse-score cut of 2.5 for adequacy). Dube and Uys identified a lack of training and supervision for the poor knowledge scores (45). A descriptive study examining the knowledge and attitudes of nurses in Napal by Gurung (46) showed that nurses had adequate knowledge on mental disorder as evidence by being able to identify genetic heritability (51%) and biochemical disturbance disturbances in the brain (91%) as causes of mental disorders. The nurses also showed knowledge that mental disorders require treatment by a psychiatrist (86%), yoga and meditation (86%) and treatment of physical illness (50%)(46). The findings in our study highlight the importance of education and ongoing support as a vehicle for improving mental health knowledge.

The social restrictiveness subscale of the CAMI was the only one to show statistically significant changes following the training (median pre-training score 28, mean post-training score 27 p-value <0.01). This finding was similar to a statistical change observed in the original study (pre-training mean 24.73, post-training mean 22.4, p< 0.002)(33).

Although there was an overall decrease in social restrictiveness scores, there are statistically significant observations indicating certain demographic characteristics were associated with more socially restrictive attitudes. Having dependents above the age of 18 (+2.5), nurses (+1.9) and mentors (+3.8). This was observed in the Ethiopian (31) and Chinese (47) cross-sectional studies where NSHW displayed high levels of paternalism. This finding is in contrast with available literature that show that working

with individual with mental disorders is associated with positive attitudes towards mental illness and stigma reduction (48).

The training recipients in this study showed an overall positive attitude towards mental disorders as evidenced by high benevolence and community mental health ideation scores as well as low social restiveness. This is illustrated by a willingness to live next to someone with illness, allowing individuals with mental disorders to participate in the economy and encourage the community to be involved in the intervention. This signifies an openness and lower stigma rates in this cohort. The findings are supported by the work of Mutiso et al (38) in the Kenyan study. Kohrt and colleagues (49) also conducted a cluster randomised clinical trial where NSHW were paired with people living with mental illness. The results found a positive improvement in attitude and service delivery. This is a model that could also be considered in our context.

Age, gender, relationship status and duration of work of the trainee participants did not demonstrate a significant impact on the test scores.

Limitations

This study is an analysis of data collected for programme evaluation purposes, and as such strict research conditions were not necessarily adhered to. There were missing entries which were accounted for through statistical analysis. Furthermore, there was no data collect long after the training had concluded. As a result, it is not clear whether the test scores were maintained or if there were changes. The data is of a strictly quantitative nature. This means that nuanced qualitative influences on the score results could not be explored. The study did not seek to investigate the cohort's understanding of the aetiological causes of mental disorders. It may be useful to evaluate this in the future and relate it to their overall knowledge and attitudes on mental health.

Conclusion

This study evaluated the change in knowledge and attitudes amongst non-specialist health workers following exposure to a mental health training intervention. The findings illustrate that providing mental health to training was impactful in improving knowledge and a decreasing in negative attitudes towards mental illness among training recipients. The improvement post-training indicates that there is value in continuing to offer mental health training to non-specialist health workers to ensure their readiness

to provide care to mental health service users. Future studies should investigate the extent to which such changes in knowledge are sustained post-training by assessing additional timepoints.

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Trainee Number:

Community Health Worker Characteristics

Please complete this form by selecting the response that applies to you and providing any extra information where it is requested. All collected information is confidential and will be used only to understand how the group responds to the training. We need your participant ID number and we do not have access to your name. The information on this form will not be shared with your supervisor.	Trainee Number:

1 When were you born?

Year: ____ Month: ____ Day: ____

2 When did you start working as a Community Health Worker? ____

3 What is your highest level of schooling or education? ____

4 What is your relationship status?

Married	In a committed relationship	Widowed	Separated	Divorced	Single	Other? Describe:

5 How many children do you have

0	1	2	3	4	5	More than 5? How many? ____

6 Besides yourself, how many people older than the age of 18 depend on you for money, food or clothing?

0	1	2	3	4	5	More than 5? How many? ____

7 How many people between the age of 5 and 18 depend on you for money, food or clothing?

0	1	2	3	4	5	More than 5? How many? ____

8 How many people under the age of 5 depend on you for money, food or clothing?

0	1	2	3	4	5	More than 5? How many? ____

9 Do you take treatment for diabetes, high blood pressure or any other medical condition?

Yes	No

If yes, which one? ____

Trainee Number:

10 Do you take treatment for any psychiatric illness?

Yes	No

If yes, which one?

11 How many people in your home suffer from any medical illness, like diabetes, high blood pressure, etc.

0	1	2	3	4	5

More than 5? How many?

12 How many people in your home suffer from any psychiatric illness?

0	1	2	3	4	5

More than 5? How many?

13 Do you have another job in addition to your community health work?

Yes	No

If yes, what is it?

14 Have you have had any other jobs before starting your community health work?

Yes	No

If yes, what work did you do?

Are you retired?

Yes	NO

15 Is there anything else you would like to tell us about yourself?

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Trainee Number:

Mental heAlth Knowledge Schedule (MAKS)

Instructions: For each of questions 1-6 below, respond by circling one answer only. Mental health problems here refer, for example, to conditions for which an individual would be seen by healthcare staff.

1. Most people with mental health problems want to have paid employment.	Agree Strongly	Agree Slightly	Neither Agree nor disagree	Disagree Slightly	Disagree Strongly	Don't Know
2. If a friend had a mental health problem, I know what advice to give them to get professional help.	Agree Strongly	Agree Slightly	Neither Agree nor disagree	Disagree Slightly	Disagree Strongly	Don't Know
3. Medication can be an effective treatment for people with mental health problems.	Agree Strongly	Agree Slightly	Neither Agree nor disagree	Disagree Slightly	Disagree Strongly	Don't Know
4. Psychotherapy (e.g., talking therapy or counselling) can be an effective treatment for people with mental health problems.	Agree Strongly	Agree Slightly	Neither Agree nor disagree	Disagree Slightly	Disagree Strongly	Don't Know
5. People with severe mental health problems can fully recover.	Agree Strongly	Agree Slightly	Neither Agree nor disagree	Disagree Slightly	Disagree Strongly	Don't Know
6. Most people with mental health problems go to a healthcare professional to get help.	Agree Strongly	Agree Slightly	Neither Agree nor disagree	Disagree Slightly	Disagree Strongly	Don't Know

Instructions: For each of questions 7-12, say whether you think each condition is* a type of mental illness *by circling only one answer

7. Depression	Agree Strongly	Agree Slightly	Neither Agree nor disagree	Disagree Slightly	Disagree Strongly	Don't Know
8. Stress	Agree Strongly	Agree Slightly	Neither Agree nor disagree	Disagree Slightly	Disagree Strongly	Don't Know
9. Schizophrenia	Agree Strongly	Agree Slightly	Neither Agree nor disagree	Disagree Slightly	Disagree Strongly	Don't Know
10. Bipolar disorder (manic-depression)	Agree Strongly	Agree Slightly	Neither Agree nor disagree	Disagree Slightly	Disagree Strongly	Don't Know
11. Drug addiction	Agree Strongly	Agree Slightly	Neither Agree nor disagree	Disagree Slightly	Disagree Strongly	Don't Know
12. Grief	Agree Strongly	Agree Slightly	Neither Agree nor disagree	Disagree Slightly	Disagree Strongly	Don't Know

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Trainee Number:

Community Attitudes Towards The Mentally Ill Scale

The following statements express various opinions about mental illness and about people with mental illness. Mental illnesses are medical conditions that disturb a person's thinking, feeling, mood, the way the person relates to others, and the person's daily functioning. Please circle the response that most accurately describes your reaction to each statement. It's your first reaction, which is important. Don't be concerned if some statements seem similar to ones you have previously answered.

Please be sure to answer all statements. Please circle the response that applies to you.

a)	As soon as a person shows signs of mental disturbance, he or she should be hospitalized	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
b)	More tax money should be spent on the care and treatment of adults with mental illness	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
c)	An adult with mental illness should be kept away (isolated) from the rest of the community	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
d)	The best therapy for many adults with mental illness is to be part of a normal community.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
e)	Mental illness is an illness like any other.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
f)	Adults with mental illness are a burden on society.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
g)	Adults with mental illness are far less of a danger than most people think.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
h)	The presence of mental health facilities like clinics and hospitals in a residential area downgrades the village.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
i)	There is something about adults with mental illness that makes it easy to tell them from normal people.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
j)	Adults with mental illness have for too long been the subjects of ridicule.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
k)	A woman would be foolish to marry a man who has suffered from mental illness, even though he seems fully recovered.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
l)	As far as possible mental health services should be provided through community-based facilities.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
m)	Less emphasis should be placed on protecting the public from adults with mental illness.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
n)	Spending more on mental health services is a waste of tax money.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
o)	No one has the right to exclude adults with mental	Strongly	Agree	Neutral	Disagree	Strongly

illness from their village.	Agree				Disagree
p) Having adults with mental illness living within a village might be good therapy for them, but the risks to residents are too great.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
q) Adults with mental illness need the same kind of control and discipline as a young child.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
r) We need to adopt a far more tolerant attitude toward adults with mental illness in our society.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
s) I would not want to live next door to someone who has been mentally ill.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
t) Residents should accept the location of mental health facilities in their village to serve the needs of the local community.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
u) Adults with mental illness should not be treated as outcasts of society.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
v) There are enough existing services for adults with mental illness.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
w) Adults with mental illness should be encouraged to assume the responsibilities of normal life.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
x) Local residents have good reason to resist (to be against) the location of mental health services in their village.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
y) The best way to handle adults with mental illness is to keep them behind locked doors.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
z) Our mental hospitals seem more like prisons than like places where adults with mental illness can be cared for.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
aa) Anyone with a history of mental illness should be excluded from taking public office (like being a ward councillor or town mayor).	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
bb) Locating mental health services in a village does not endanger local residents.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
cc) Mental hospitals are an out-dated means of treating adults with mental illness	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
dd) Adults with mental illness do not deserve our sympathy.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
ee) Adults with mental illness should not be denied their individual rights.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

ff) Mental health facilities should be kept out of residential villages.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
gg) One of the main causes of mental illness is a lack of self-discipline and will power	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
hh) We have the responsibility to provide the best possible care for adults with mental illness.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
ii) Adults with mental illness should not be given any responsibility.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
jj) Residents have nothing to fear from people coming into their village to obtain mental health services.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
kk) Virtually anyone can become mentally ill.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
ll) It is best to avoid anyone who has mental problems.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
mm) Most women who were once patients in a mental hospital can be trusted as baby sitters.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
nn) It is frightening to think of people with mental problems living in residential village.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree