Parenting for Lifelong Health Programme for Parents and Teens in Botswana: Cost Estimation and the Budget Impact Analysis

By

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PART 0: PREAMBLE
PLAGIARISM DECLARATION

I, Musa Christian Ntuli, hereby declare that the work on this dissertation/thesis is based on my original work (except where acknowledgements indicate otherwise) and that neither the
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DEDICATION

I dedicate my thesis to my wife, my children and my sister who have shown me great support and encouragement throughout this journey, to all my friends for their words of encouragement, and to God for making everything possible.

Abstract

Given all its detrimental effects, child abuse is one of the biggest public health issues. Depression, suicidal thoughts, risky sexual behaviour, and substance abuse are perfect examples of these effects. The Parenting for Lifelong Health (PLH) study was conducted in twenty-five nations with low to middle incomes, including Botswana. The goal of the PLH SUPER study is to address and stop child abuse in environments with limited resources. The overall and unit costs of the PLH program and the Budget Impact Analysis (BIA), should it expand to national levels, were estimated by this PLH SUPER sub-study.

Micro-cost analysis was performed from April 2021 until March 2022, taking the provider perspective to make a computation on the total and unit costs of enrolling families in the PLH program. The target population of the teenagers of age 10–17 and their guardians were the aimed group in Botswana, and the BIA was subsequently determined through the unit cost per family enrolled.

The results exposed variation in every PLH program implementation cost across centres, from US $22,771.96 in Goodhope, to US $60,662.82 in Gaborone. The unit cost per enrolled family ranged from US $168.68 in Goodhope, to US $336.91 Letlhakane. Personnel costs accounted for 64% of total expenditure. The PLH enrolment coverage projected at 5.7% and 40,525 families identified as the programs target population for national scale-up. The cost per family enrolled in the PLH program ranged from US $168.68 to US $336.91, per family. Therefore, the total budget needed for expanding the PLH program varies from US $6,835,788.61 to US $13,653,186.67

This study investigated the cost implication of nationally scaling-up PLH interventions in Botswana. The findings of this study present the decision makers with guidance on the possible costs that could be incurred in scaling-up the PLH interventions countrywide. Furthermore, the study also guides policy makers on how the national scale-up could impact the existing health and wealth budget. This study immensely contributes on the global discourse on prevention of maltreatment. Lastly, Cost Effectives Analysis study for rolling out PLH interventions in Botswana is highly recommended.

Acknowledgements

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List of Abbreviations

Abbreviation	Description
BIA	Budget Impact Analysis
BWP	Botswana Pula
CEA	Cost Effectiveness Analysis
COPE	Community Parent Education Program
CWBSA	Clowns Without Borders South Africa
NGO	Non-Governmental Organisation
IY	Incredible Years
LMIC	Lower Middle-Income Countries
MLG&RD	Ministry of Local Government & Rural Development
PLH	Parenting for Lifelong Health
SSI	Stepping Stone International
SUPER	Scale-Up of Parenting Evaluation Research
UNICEF	United Nations Children's Fund
USAID	United States for International Development
USD	United States Dollar
WHO	World Health Organisation

PART A: PROTOCOL

SECTION 1: INTRODUCTION

Background Information

Violence is described 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" (World Health Organisation, 2002). Globally, about one billion children are subjected to violence each year, with over 120 million adolescent girls and young women below the age of 20 years who encountered forced sexual contact (UNICEF, 2020). In Botswana, 88% and 66% of women and men respectively have reported to have been physically and sexually violated when they were children (Machisa, 2012). In an investigation on the prevalence of violence in South Africa, it was found that higher levels of physical, emotional and sexual abuse were mainly perpetrated by caregivers, family members, teachers and boyfriends (Meinck, 2016).

1.1. Problem Statement

When children are subjected to maltreatment, there is a likelihood that such children could end up suffering from depression, suicidal thoughts, sexual risky behaviours and substance abuse (Felitti et al, 1998). The child maltreatment could also result in acquisition of sexual transmitted infections, cancer and heart disease (WHO, 2020). The risk of becoming violent during adulthood is increased among children who have been subjected to abuse at young age (WHO, 2020).

According to the American Society for the Positive Care of Children (2020), poor parenting is one of the variables responsible for adolescent’s antisocial and criminal behaviour, mainly because they have encountered maltreatment from their caregivers. It is also one of the contributory factors to psychological disorders among children.

Schwartz at al (2006) have confirmed what many scholars have already proven that poor parenting and corporal punishment are strongly associated with intimate partner violence perpetrated by those who were victims during childhood.

1.2. Rationale

For a long time, the interventions to prevent child abuse were child centred and mainly focused on educating children to identify abuse (Rudolph et al, 2020). However, involving parents in the prevention of child maltreatment has been found to be effective. Scot (2012) has argued that the parenting programs are effective in preventing maltreatment of children leading to better behavioural outcomes.

To address poor parenting as one of the main variables influencing the behaviour of adolescent from 10 to 17 years, there are several parenting programs that have been implemented in various countries. In the United States, several parenting programmes (Creating Lasting Connections, Family in Connection, Family Matters, Multidimensional Family Therapy, Stars for Families, Strengthening Families, Nurturing Parenting and Triple P - Positive Parenting Programme) were tested and found to be effective (Wilson et al, 2012). In Europe, various evidence-based parenting programme (the Örebro Prevention Program, Connect, Community Parent Education Programme, Strengthening Families Programme, Parenting for Lifelong Health, Triple P and the Parent-management training Oregon) were also found to be effective on teens and adolescents (The European Commission, 2019).

All these evidence-based parenting interventions were tested in high income countries hence there is limited evidence reported from low- and middle-income countries (LMICs) and this makes parenting programmes imperative in low resource setting to which have high burden of child maltreatment (Mejia, 2017).

1.3. The Scale-Up of Parenting Evaluation Research (SUPER) study

The WHO, UNICEF, Stellenbosch University, University of Cape Town and University of Oxford are conducting a study focussing on the parenting program called Parenting for Lifelong Health (PLH) in 25 LMICs, including South Africa, Zimbabwe and Botswana. The PLH intervention has been designed to upskill parents and caregivers with optimal parenting skills with a primary intention of reducing child maltreatment. The PLH SUPA study tailored for teens, targets teenagers from the age of 10 to 17 years, including their parents and caregivers. At the centre of the PLH program, is the reduction of violent behaviour through appropriate parenting skills that promote a nurturing environment for children. The program is implemented by the organisations that use community-based workers to recruit parents and their teens to participate in 14 sessions to strengthen caregiver teen relationship. This PLH study aims to determine if there is evidence of effect in routine conditions in reducing child maltreatment and improved children's wellbeing in LMICs.

The wide scale up of PLH program in Botswana is expected to improve wellbeing of the beneficiaries by reducing incidences of maltreatment of teen and adolescents. To prevent maltreatment of teens and adolescent, the Botswana government could adopt the PLH program if the study proves that it is feasible to implement. Extensive cascade of this program warrants investigation to determine the financial implications related to implementation. Therefore, the feasibility of the nationwide roll out requires cost estimation and the budget impact analysis so that the government could be guided on how to plan for the rollout.

This research is a sub-study of the PLH SUPER study and aims to estimate the programme costs and the budget impact of scaling up its implementation in Botswana.

1.5 Literature Review

Wonderling et al (2005) defined Cost Effectiveness Analysis (CEA) as "a method of economic evaluation where the value of the resources spent on an intervention is compared with the quantity of health gained as a result". The CEA conducted in Sweden, comparing the Comet, Connect, the Incredible Years (IY), COPE, bibliotherapy, and a waitlist control, for the prevention of persistent behaviour problems found all the interventions to be cost effective based on the threshold of US$15000. However, the costs of intervention were ranging from US$14 for bibliotherapy to US$1300 per child for Incredible years (IY) (Nystrand et al, 2019). The study also found that the COPE and Bibliotherapy have basically dominated other options of interventions. Redfern et al (2018) estimated the cost of implementation of the PLH program in South Africa and found the total cost per incident of physical or emotional abuse averted to be US$1837. The overall cost of implementing the PLH for teens for the entire period of the trial was US$504 per family enrolled.

Countries are beginning to recognise the value of the Budget Impact Analysis (BIA) as a critical factor in the determination of the future scale up of the newly introduced interventions. According to Leelahavarong (2014), BIA is helpful in determining the feasibility of accepting a new intervention by assessing the affordability of such an intervention because resources and budgets are not limitless. Since BIA investigation results are relevant for a specific health program in a specific country or region, there are limited published BIA for parenting programmes.

SECTION 2: AIM AND OBJECTIVES

2.1. Aim of the study

The aim of the study is to determine the affordability of scaling up the PLH program in Botswana.

2.2. Objectives of the study

1. To estimate the total and unit costs of the PLH programme.

2 To determine the budget impact of nationally scaling-up the PLH programme.

SECTION 3: METHODS

3.1. Study Design

The study design for this research will be a cost and budget impact analysis, focussed on the collection of primary cost data from PLH implementing agency. The study will be carried out from a provider's

perspective. The most applicable costs will be associated with the resources required for the implementation of PLH program. Non-Probability sampling will be used, particularly the convenient sampling because costing data will be collected based on families that are already enrolled to the programme.

3.2. The parenting programmes.

The programme is delivered through a non-governmental organisation which employs the community-based workers to recruit and enrol primary care givers and their teen children between the age of 10 and 17 years residing in Botswana. They go through 14 sessions that that are designed to strengthen parent teen relationship. Home visit consultations and a peer support component are also incorporated into the programme.

3.3. Recruitment and enrolment

The only organisation - an international non-governmental organisation (NGO) - implementing the PLH programme for parents and 10-17 years old adolescents will be included in the study.

3.4. Research procedures and data collection methods

Data will be collected from the organisation implementing the PLH program using time sheets and costing templates. The total recurrent (salaries, overheads, transport, maintenance, etc) and capital costs (training, buildings, vehicles, etc) will be estimated for 2021. For each study site, utilization data will be used for estimating the unit cost per family and the unit cost per visit. Additional information on the resources used to implement the PLH program will be sourced from the PLH project managers. Economic costs will be estimated as there may be resources that have been used for the service delivery but may have not been paid for by the funder (e.g. volunteer labour, donated items, etc).

3.5 Data Safety and Monitoring

The study will use primary data which will be captured from the data collection form to the Microsoft excel sheet. The Microsoft excel sheet will have password and it will also be stored in the password control folder in the personal computer to ensure data security. Hard copy completed data collection tools will be kept in the locked filing cabinet which will be accessed by the research team only.

3.6. Data Analysis

3.6.1. Cost Analysis

Tables 1 and 2 below present a summary of the categories of resources that will be considered and the methods that will be used to collect, measure and value these costs. For each study site, the unit costs will be estimated by dividing the total cost of running the PLH programme by the number of

families completing the programme, the number of home visits and the number of visits to the centre.

The costs will be expressed in 2021 Pula and US$.

Table 1:Methods and data used in estimating costs: Identifying and measuring recurrent costs.

TYPE OF COST	IDENTIFICATION		MEASUREMENT		VALUATION	
Recurrent cost	Categories	Costing method	Related information for allocation purposes	Source of data	Valuation methods	Source of data
Administration & management	Management and administration staff	Document staff time on different activities Total remuneration package costs. Any external costs	Number of sessions attended by families.	Time sheets and record reviews	Gross salary per month, including benefits (Cost to company)	NGO salary packages
Overheads	Electricity, water and other utilities Rent (where applicable) Telephones, faxes & postage Stationery, computer consumables & photocopies Printing programme handbook Support staff (all staff not classified as community worker, admin. and management, or maintenance)	Actual costs from facility records In case of support staff, total remuneration package	Number of sessions attended by families	Expenditure reports	Expenditure records	Expenditure records
Program personnel:	Project Manager M&E Manager Data Captures Community Based Workers	Total remuneration costs Calculate separately for each category of personnel listed in previous column	Number of sessions attended families	Time sheets and record reviews	Gross salary per month, including benefits (Cost to company)	NGO salary packages
Transport/ Vehicle running costs	Sedan (Purchased/ leased	Number of kilometers travelled in a year. AA rate per kilometer	Number of sessions attended by families.	Observation, transport records	Expenditure records	Transport contracts and records
Maintenance		Actual costs of supplies related to maintenance activities. Total remuneration costs of maintenance staff External costs	Number of sessions attended by family	Observation, record reviews	Tender contract prices and expenditure records	Department of Public Works, Supply Chain Management: records and contracts, clinic expenditure records

Table 2: Methods and data used in estimating costs: identifying capital costs.

TYPE OF COST	IDENTIFICATION		MEASUREMENT		VALUATION	
Capital costs	Categories	Costing method	Related information for allocation purposes	Source of data	Valuation method	Source of data
Building	Office Space Rented venues	Current replacement cost per m^2 x square meter of facility). 30-year life span. 3% discount or annuitization	Space (square meters)	Record reviews	Replacement and contract prices or rent.	Department of Public Works, building contractors Supply Chain records for hiring venues for sessions.
Furniture and other equipment	Tables, chairs, cabinets,	Actual current replacement cost. 10-year life span for furniture and 5-year life span for equipment 3% discount rate for annuitization	Resources used by each cost Centre. Number of employees	Record reviews	Replacement and contract prices, rental fees	Department of Public Works, Supply Chain Management: records and contracts
Vehicles		Actual current replacement cost. 6-year life span. 3% discount rate for annuitization	Number of home visits Logbooks/time spent travelling for program related activities	Transport records	Replacement and contract prices, rental charges	Transport contracts and records
Initial Training	Training of community-based workers training on PLH program	Actual current cost of training. 2-year life span. 3% discount rate for annuitization	Number of staff trained. Time spent on different services by these staff. Number of consultations per type of service	Management, training records	Course fees; for in-house training – staff remuneration	Training Providers, remuneration packages

3.6.2. Budget Impact Analysis

For the budget impact analysis, the expenditure-based model will be constructed using the Microsoft Excel. The size of the population that will be reached by the interventions will be determined. This program targets parents and their adolescents from 10 to 17 years old residing in Botswana. Lastly, the unit cost estimates will be utilized to inform scale-up and provide overall budget estimates based on various possible scenarios. This analysis should assist the decision-makers in Botswana when deciding whether the intervention is feasible for adoption.

SECTION 4: ETHICAL CONSIDERATIONS

4.1. Description of risks and benefits

Possible threats and risks associated with the study are non-existent since the study is conducted by collecting data from the implementing agencies and the data does not have personal information of the program beneficiaries. The study may possibly lead to indirect benefits accrued when the entire society benefits from a parenting program which reduces maltreatment among adolescents.

4.2. Informed consent process

In this study, there are no individuals that will be recruited to participate in the costing of the intervention. Costing data will be collected from the implementing agencies that are already part of the study. Therefore, no consent is required since costing data does not require individual's personal information. Access to the PLH implementation agencies have already been granted by the principal investigator of the main study.

4.3 Privacy and confidentiality

During this study, no personal information or identifiers will be used or captured on the data collection tools. However, privacy and confidentiality of any costing information will be observed all the time. The completed data collections tools will be kept in the locked cabinet which will only be accessed by the research team. The electronic data will be on the password-based folder in the personal computer and the Microsoft excel sheet will be locked and it can only be unlocked and accessed by the research team using a password.

SECTION 5: PUBLICATION AND DISSEMINATION POLICY

After completion of the research project, the study will be submitted for the master's in public health: Health Economics Degree. The results of the study will also be shared with the PLH SUPER study research team and submitted for publication in a peer reviewed journal.

SECTION 6: LOGISTICS

This study will be conducted over a period of 12 months. All the research project activities and timeline are depicted in Table 3 below.

Table 3: Study activities and timelines (January to October 2022

Activity	January	Feb	March	April	May	June	July	Aug	Sept	Oct
Finalize protocol.	X									
Secure UCT ethical clearance		X								
Finalize data capture forms.		X								
Collect data: Observation & interview			X	X						
Collect data: Review records, tender docs, etc.				X	X					
Capture data on database						X				
Analyze & clean data.							X	X		
Write up.									X	
Complete dissertation										X
Submission										X

SECTION 7: BUDGET

Self-funded.

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PART B: STRUCTURED LITERATURE REVIEW

2.0. Introduction

This study sought to investigate the affordability of scaling up the PLH program in Botswana for adolescents between the age of 10 and 17 years and their caregivers/ parents by estimating the total and unit costs and budget impact of scaling up the program. Therefore, the objectives of this literature review were to identify information on the following: a) the Epidemiology of child maltreatment; b) The association between violence and child maltreatment; c) How Parenting for lifelong health Programs aimed at reducing child maltreatment and violence; d) The economic evaluation methodology for health care services, budget impact analysis, and comparable approaches taken for parenting programs. The second section pays special attention to various models of parenting programs and delves deeper into discussing the PLH program. The third section consists of a short theoretical overview of the cost analysis as part of health economic evaluation and its role in the PLH program. The third section also discusses the Budget Impact Analysis, which is essential in decision-making. The fourth section delves in to the limitations of the study. Finally, the conclusion summarizes the findings from the literature review and detects gaps that rationalize undertaking a costing study for the PLH program in Botswana. This study's literature is obtained through an exploratory search of Google Scholar, PubMed, and EBSCO host database using identified keywords. The grey literature was manually searched through google, and the references cited in this study were also manually identified.

2.1. Epidemiology of child maltreatment

Globally, violence against children and adolescents is one the problematic phenomena. Across the globe, about one billion children are subjected to violence each year, with over 120 million adolescent girls and young women below the age of 20 years who encountered forced sexual contact (UNICEF, 2020). One out of two children are reported to have encountered some form of violence across the globe (UNICEF,2020)

A child maltreatment study focussing on children between the age of 11 and 16 years in Croatia, Bulgaria, Greece, Albania, Turkey, Serbia, Republic of Macedonia, Bosnia, and Herzegovina found that the lifetime prevalence of psychological and physical violence was above 50% (Nikolaidis, 2018). In the United States of America (USA), a longitudinal study between 2000 to 2001 found that the lifetime prevalence of child maltreatment was 4.5% for sexual abuse, 28.4% for physical assault, 11.8% for physical neglect, and 41.5% for supervision neglect (Hyunil Kim, 2017).

In Africa, there were limited studies conducted on child maltreatment. However, in Africa, the prevalence of child maltreatment was very high at 41.8% and 39.1% for girls and boys, respectively (Moody, 2018). UNICEF published a report that indicated that in sub-Sahara, East and West African Countries like Sudan, Somalia, Egypt, and Djibouti, the estimated number of girls who suffer genital

mutilation is three million (UNICEF, 2015). Child trafficking is a form of child maltreatment, which is one of the serious challenges in Africa as it is estimated that about 200 000 children are trafficked every year in Burkina Faso, Benin, Nigeria, Ghana, Mali, and Mauritania (Badoe, 2015).

A study that was conducted in South Africa reported that the lifetime rates of physical, emotional, and sexual abuse were 34%, 16%, and 20%, respectively, among adolescents between the age of 15 and 17 (Burton, 2015). In Swaziland, the lifetime prevalence of emotional abuse was found to be high at 28.5% (Meink, 2017). In nearby Swaziland, nearly one-in-five females had experienced physical abuse in their lifetime, with nearly one-in twenty having experienced abuse that was so severe that it necessitated medical attention (Breiding, 2013)

In Botswana, national population-based survey findings have reported that physical violence was the most common form of violence perpetrated against adolescents (Ministry of Local Government & Rural Development ([MLG&RD], 2019). This survey also found that 28.4% and 43.0% of males and females, respectively, were sufferers of physical violence in Botswana, and the common perpetrators were peers, parents, caregivers, adult relatives, and adult community members. The survey also reported that 13% of the adolescent students were the victims of rape in Botswana (MLG&RD, 2019)

2.2. Parenting and child maltreatment

Parenting is a child-rearing practice, behaviour, beliefs, attitude, perception, expectations, knowledge, ideas, goals, and values that caregivers and parents transmit to the child (Ntswarang et al, 2020). Parenting practices can also be described as a direct behaviour parents utilize in their children's upbringing (Darling and Steinberg, 1993). Parenting is construed as the most complex and overwhelming exercise which could result in positive and, in some instances, adverse outcomes in the life of a child (Ulfsdotter, 2016).

2.2.1. Parenting typologies

According to Burns & Gottschalk (2019), traditional and modern parenting styles are the main parenting typologies. The two dimensions of traditional parenting are demandingness and responsiveness (Burns & Gottschalk, 2019). The Demandingness dimension emphasizes a high expectation for the child to uphold family rules, and this dimension is also characterized by obedience. Strict enforcement of set family rules and responsiveness has much to do with the extent to which the parents express their respect, acceptance, and warmth as a contribution to the child's developmental needs (Burns & Gottschalk, 2019). According to Burns & Gottschalk (2019), traditional parenting is divided into the following types:

2.2.1.1. Authoritative Parenting Style

Parents and caregivers who practice authoritative parenting styles are both demanding and responsive. Those that practice this parenting style are reported to have the ability to communicate effectively with their children, and they reward the children for positive behaviour and discipline them when they break the rules. Children of parents and caregivers who practice authoritative parenting have high self-esteem, academic achievements, and self-efficacy if harsh treatment is not part of parenting (Georgiou, Ioannou, and Stavrinides, 2017).

2.2.1.2. Authoritarian Parenting Style

Parents and caregivers who exercise authoritarian parenting style are demanding but not responsive. To ensure that there is maximum compliance to family rules, the parents practicing authoritarian parenting make use of power and various forms of abusive parenting to make sure there is obedience. This parenting style could affect a child's mental health (King, Vidourek & Merianos, 2016).

2.2.1.3. Permissive Parenting Style

It has been reported by various studies that parents who practice permissive parenting are responsive but not demanding. The parents exercised the permissive parenting style, showed love and warmth, and set few rules for their children. Various studies indicated that the children of parents and caregivers who employ permissive parenting are most likely to engage poorly with other children (Dehue et al., 2012). High performance in school and high self-esteem were reported among children of the parents and caregivers who exercise permissive parenting (Calafat, 2014).

2.2.1.4. Neglectful Parenting Style

The neglectful parenting style is practiced by parents and caregivers that are neither demanding nor responsive. The parents with a neglectful parenting style set no rules for the children and leave children without supervision. Children of neglectful parents and caregivers usually suffer from emotional and psychological problems, and in most instances, they are disruptive, depressed, aggressive, and suicidal (Singh and Behmani, 2018).

2.2.2. Impact of Child Maltreatment on children and adolescents

When children are subjected to maltreatment, there is a likelihood that such children could end up suffering from depression, suicidal thoughts, sexual risk behaviours, and substance abuse (Felitti et al., 1998). Various studies have demonstrated that adolescent depression, suicidal ideation, and low

self-esteem are easily predicted by dysfunctional family settings (Stavropoulos et al., 2015). Children who experience maltreatment have a higher risk of not completing school, and adults who have encountered violence during childhood are more likely to become perpetrators of violence (WHO, 2020). Schwartz at al (2006) have confirmed what many scholars have already proven that poor parenting and corporal punishment are strongly associated with intimate partner violence perpetrated by those who were victims during childhood. When children are subjected to maltreatment, there is a likelihood that such children could end up suffering from depression, suicidal thoughts, sexual risk behaviours, and substance abuse (Felitti et al., 1998)

2.3. Current Parenting Programs

2.3.1. Community Parent Education (COPE) Program

COPE is a community-based education program that uses parenting manuals to educate parents on optimal parenting skills (Thorel, 2009). A group of between 25 to 30 meets for two hours sessions on weekly bases for ten weeks with one or two group leaders (Thorel, 2009). The COPE parenting program applies the social learning theory, some principles on cognitive and social psychological models on attitude change, and family systems theory for children between the age of 03 and 13 years (Nystrand et al., 2019). The COPE program study that was conducted in Sweden reported that COPE was effective in reducing lack of perceived parental control, parental stress, conduct problems, hyperactivity, and daily problem behaviours (Thorel, 2009).

2.3.2. COMET

COMET is a parenting program implemented in Sweden to address children's behavioural problems using Webster-Stratton's, Patterson's, and Barkley's parent management models and cognitive behavioural therapy (Nystrand et al., 2019). This program targets the parents of children between the age of 03 to 12 years who attend two and half-hour sessions weekly. This intervention was tested in the random control trial and found effective in externalizing children's behaviour (Nystrand et al., 2019)

2.3.3. Connect

Connect parenting program focuses on the parents of children between the ages of 9 and 16 years using the attachment, relational and systematic theories to externalize children's behaviours by attending ten one-hour weekly sessions (Nystrand et al., 2019). The connect parenting interventions were reported to be effective in externalizing children's behaviours (Barone et al., 2019)

2.3.4. The Incredible Years

Incredible Years (IY) is a reputable group-based parenting program established to improve parenting skills and improve the quality of the relationship between parents and children, by promoting children's emotional and social competence (Arruabarrena et al., 2021). The Incredible Years applies Bandura's notions of modelling and self-efficacy. Participants in the program were children between the age of 03 to 8 years who attend 12 two- and half-hour sessions every week (Nystrand et al., 2019).

2.3.5. Bibliotherapy

Bibliography is a parenting program that was developed based on COMET, and it targets children between the age of 02 and 12 years (Nystrand et al., 2019). The bibliography focuses on positive parenting, and it was found to be effective in reducing children's behavioural problems (Nystrand et al., 2019).

2.3.6. Creating Lasting Family Connections (CLFC)

This parenting program was designed to empower participants with improved parenting skills and family relationship skills that will help the youth who are between the age of 9 and 19 to be more resilient and have better knowledge about the implications of drug and alcohol use (Strader, 2018). This program employs the experiential learning theory using role plays, games, reflective exercises, and brainstorming (Strader, 2018). A year after participating in the program, the participants reported to be less angry and having improved communication with other family members (Strader, 2018).

2.3.7. Family Matters

Family matters is a parent-based parenting program designed to amplify positive parenting and improve communication between children and their parents or caregivers with a particular focus on healthy sexual behaviour (Miller, 2013). The Family matters parenting program is an intervention that targets the caregivers of children between the age of 09 and 12, and these caregivers attend five evidence-based sessions to improve their parenting skills (Miller, 2013).

2.3.8. Multidimensional Family Therapy

The Multidimensional Family Therapy is an evidence-based parenting program that focuses on the following interdependence domains: Adolescent, parent, family interactions, and extra-familial (Danzer 2014). The adolescent domain teaches the child about improved social skills and alternatives to the use of substances (Danzer 2014). The parent domain seeks to equip the parent with positive

parenting skills to improve their ability to set the limit for the children and have improved emotional responsiveness towards the child (Danzer 2014)

2.3.9. Strengthening Families

Strengthening families is a parenting program designed to create a protective environment for children of substance-abusing parents by equipping the entire family to improve parenting skills, and family relationships and getting the social skills of young people improved (Kumpfer, 2020). The strengthening family program targets parents and their children who are between the age of 06 to 12 years who attend three courses that run for 14 weeks. (Kumpfer, 2020). The family strengthening program was found to be reducing child maltreatment, depression, anxiety, and substance abuse in 12 random control trials (Kumpfer, 2018).

2.3.10. Nurturing Parenting

Nurturing Parenting program is a family-centred intervention designed to improve nurturing parenting skills contrary to the abusive parenting style (Bavolek, 1983). In the nurturing parenting program, parents are taken through some ten independent 60 to 90 minutes sessions to learn about parenting. The study was conducted to determine the effectiveness of nurturing parenting. The study found that the program improved parenting knowledge and attitude (Greeno et al., 2021).

2.3.11. Triple P - Positive Parenting

Triple P - Positive Parenting is a program that equips parents with positive parenting skills that help them to be confident in managing their children's behaviour. This program is designed to offer the prevention or management of emotional, developmental, and behavioural problems (Degraaf et al.,2008). The disruptive behaviour was proven during a scientific study to have been reduced by Triple- P positive parenting interventions (Degraaf et al.,2008).

2.3.12 Parenting for Lifelong Health (PLH)

Parenting for Lifelong Health (PLH) is a parenting program that is none commercialized, open access designed to prevent violence in a low-resource setting, particularly LMICs (WHO, 2020). PLH is an evidence-based parenting program that was established in 2012 by a consortium that consisted of the WHO, UNICEF, Oxford University, the University of Cape Town, and the University of Stellenbosch to prevent child maltreatment in LMICs (Steinert et al., 2018). The main aim of the PLH program is to strengthen the ability of caregivers and parents to create a nurturing and protective environment for their children through positive parenting (Steinert et al., 2018). This programme improves parent-adolescents' knowledge, proficiencies, mental health and parenting skills and it also improves the

environment in a family set up to protect the children and adolescent against physical, emotional and psychological abuse (Cluver, Meinck, Shenderovich, Ward, Romero et al., 2016)

The target population for the PLH program is the parents and their children between the age of 02 to 17 years. The PLH program enrols parents/caregivers and children to attend 14 sessions weekly, and the sessions are designed to address psychological and social factors and over and above these, parents & children are also capacitated on effective budgeting and saving (Steinert et al., 2018). The program sessions for parents are facilitated by trained community members, Social Auxiliary Workers (SAW), and lay workers who have attended one-week PLH facilitation training before they could facilitate the 14 sessions and participants who fail to attend, they benefit from home-based sessions. Sessions were held weekly for 12–16 caregiver-adolescent pairs, which lasted around 3–4 hours. (Steinert et al., 2018). The Random Control Trial that was conducted in South Africa found that the PLH was effective in improving positive parenting. However, the PLH studies are still being conducted in 25 LMICs.

2.4. Economic Evaluations for Parenting Programs

Various studies have reported that there are numerous parenting programs implemented across the globe. However, the published costing data for parenting programs is limited since most studies pay special attention to the effectiveness of parenting interventions. Following a thorough search, there was a Cost Effectiveness Analysis study that was found, comparing the Comet, Connect, the Incredible Years (IY), COPE, Bibliotherapy, and a waitlist control, for the prevention of persistent behaviour problems, and all these interventions were found to be cost-effective based on the threshold of US$15000 (Nystrand et al., 2019). However, the costs of interventions ranged from US$14 for Bibliotherapy to US$1300 per child for Incredible Years (IY) (Nystrand et al., 2019). The study also found that COPE and Bibliotherapy have dominated other options of interventions. Redfern et al. (2018) estimated the cost of implementing the PLH program in South Africa and found the total cost per incident of physical or emotional abuse averted to be US$1837.

The second costing study for a parenting program was conducted in Liberia. According to the International Rescue Committee (IRC) (2016), the parenting program implemented in Liberia called Parents Makes the Difference" (PMD), which focused on the reduction of harsh discipline and implementing activities to promote children's cognitive development, was found to be costing between US$650 and US$ 900 per family that participated. The third costing study for the parenting program was conducted in South Africa. The study reported that the overall cost of implementing the

PLH for teens for the entire trial period was US$504 per family enrolled in South Africa (Redfern et al.,2018). Another Cost Effectiveness Analysis was conducted in Somalia for a culturally tailored parenting program called Ladnaan (Nystrand et al., 2021). The Ladnaan was found to be more cost-effective compared to the waitlist option among Somalian immigrants (Nystrand et al., 2021).

The economic evaluation study was conducted to determine the cost-effectiveness of the triple -P Positive Parenting program, and the study reported that when compared to no intervention, the Triple-P Positive parenting was cost-effective at AU $5 000 thresholds per DALY averted if implemented in the group format. The Incremental Cost Effectiveness Ratio (ICER) for Triple-P Positive parenting was found to be AU $1 013 per DALY averted if conducted in the group form. However, Triple-P Positive parenting was reported to be having an ICER of AU $20 498 per DALY averted if implemented using an individualized approach at 95% confidence interval (Sampaio et al., 2018).

Table 4: Summaries of economic evaluations for parenting programs

Study	Objective	Study participants & setting	Intervention	Outcome measure (s)	Perspective	Costs	Summary of results	Conclusion
Nystrand et al., 2019	For the purpose of preventing persistent behavioural issues, Comet, Connect, the Incredible Years (IY), COPE, bibliotherapy, and a waitlist control are employed..	Parents of children between the age of 05 and 18 years The setting was Sweden	In order to prevent persistent behavioural issues, parents and their kids were enrolled in and attended 10–12 parenting sessions for Comet, Connect, the Incredible Years (IY), COPE, bibliotherapy, and a waiting list control program.	Disability Adjusted Life Years (DALYs) averted	Provider Perspective	Costs were. modelled. Costs were presented in 2012 US dollars.	All interventions were found to be cost-effective. However, COPE was the most cost-effective option.	Cope is the best option among all the interventions
Sampaio et al., 2018	The triple-P positive parenting program's cost-effectiveness in comparison to no intervention was assessed through an economic evaluation study.	Parents of children between the age of 5–9-years with CD in Australia are currently seeking treatment. The setting was Australia	Parents of children between the age of 5 and 09 years with CD are enrolled in the Triple P positive parenting by attending prescribed sessions	Disability Adjusted Life Years (DALYs) averted	Provider Perspective	Costs were modelled. Costs were presented in 2013 Australian dollars.	The Triple -P Positive Parenting program was found to be cost-effective.	The Triple – P Positive Program is recommended for treating and preventing CD.
Redfern et al.,2018	The objective was to investigate the cost of the PLH program per family enrolled in the program.	Adolescents (aged 10–18) and their caregivers The setting was South Africa.	Adolescents and their caregivers attended 14 weekly sessions that were conducted by a local professional	Total Implementation cost per family enrolled. Total cost per incident of emotional and physical abuse averted	Provider perspective	Costs were modelled. Costs were presented in 2015 US dollars.	PLH Program was found to be cost-effective compared to existing violence prevention programs	PLH is recommended for the prevention of violence since it is cost-effective.

All the above costing studies for the parenting programs were conducted using the provider's perspective (Nystrand et al., 2019; Sampaio et al., 2018; International Rescue Committee (IRC), 2016); Redfern et al.,2018). According to Drummond (2015), the societal costing perspective considers the costs incurred by the patients and the service provider. However, the patient perspective only considers the costs incurred by the patient in pursuit of accessing the health service. Therefore, aligned to this study is the provider perspective, which considers the costs incurred by the service provider (Drummond et al. 2008).

During the decision-making process on health interventions, the cost-effectiveness of such interventions is usually at the centre of decisions. However, Any Cost Effectiveness Analysis (CEA) always has uncertainties regarding both the additional benefits and the additional costs of the intervention. Uncertainties on the CEA could emanate from parameters, depending on the type of decision model used for the estimation of costs and effects of the interventions (Drummond et al. 2015). Therefore, to examine the sturdiness of the CEA findings, a sensitivity analysis should be conducted (Drummond et al. 2015).

Due to the positive time preference, the discounting rate is vital in economic evaluations since it takes into consideration the time the costs were incurred and the opportunity cost of the assets or items and calculates the present value of the goods (Drummond et al. 2015). Currently, there is no convergent view on which discounting rate should be applied in economic evaluations. However, the chosen discounting rate should always be in line with economic evaluation theory and published literature related to economic evaluations (Drummond et al. 2015).

Two costing studies indicated in this review mentioned the discounting rate of 0% and 3%, respectively, in their costing analysis. (Nystrand et al., 2019; Sampaio et al., 2018). However, two other costing studies (Redfern et al.,2018) did not mention the discounting rate. The first study, which compared Comet, Connect, the Incredible Years (IY), COPE, Bibliotherapy, and a waitlist control, used the Incremental Cost Effectiveness ratio (ICER) judged against the threshold to determine the Cost Effectiveness of the interventions (Nystrand et al., 2019). The two studies have mentioned the use of the Cost-Effectiveness Threshold to judge the cost-effectiveness of the intervention (Nystrand et al., 2019; Sampaio et al., 2018). However, the other study, which was a costing study for the PLH in South Africa, did not mention the Cost Effectiveness Threshold (Redfern et al.,2018).

2.4. Economic analysis of healthcare programs

Phillips (2005) defines health economics as the branch of economics that is applied in the context of health or as a logical and explicit framework to assist decision makers, governments, agencies, and health workers on resource allocation and making choices on health interventions. Health economics is also about the assessment of health technology or interventions, which could be vital for economic evaluation in the form of budget impact analysis or costing study. In economic evaluation, health interventions costing studies are key in informing the allocation of resources and health care financing. In essence, costing is a critical element of economic evaluation because its results emanate from cost estimation (Simoens, 2009). Costing studies plays a pivotal role during the health commodity budgeting, forecasting, negotiations and contracting (Walker, 2001)

2.6. Methodology of costing health care services

Cost is defined as the value of health care resources expressed in monetary terms (Wonderling, 2005). Costing consists of the estimation of health care resources employed, and health interventions unfold through the following sequence: Identification of the costing perspective, Resources Identification, Measurements of resources, Resources valuation, and sensitivity analysis (Drummond et al. 2008).

2.6.1. The perspective

The costing perspective is described as the standpoint from which the effects and costs of the interventions are measured to determine the cost-effectiveness of health technology or intervention. In economic evaluations, the perspectives that are used are patient, provider, and societal perspectives (Drummond et al., 2015). When it comes to the economic evaluation of health services, the choice of the study perspective is also determined by the method of evaluation employed in the study. A perfect example is that if the Cost Benefit Analysis is the preferred method of evaluation, the societal perspective is highly recommended (Mishan, 1971; Dasgupta and Pearce, 1972).

In most instances, the choice of costing perspective usually depends on who has commissioned the study. The costing perspective has much to do with which costs shall be included in the study (Drummond et al., 2015). If the study shall include all costs incurred by both the health provider and patient, it means the societal perspective is being employed (Drummond et al., 2015). However, if the costs that are accounted for are only the costs incurred by the patient, it means the patient perspective is being employed (Drummond et al., 2015). Examples of costs incurred by the patient in accessing health services include transportation, consultation fees, laboratory or diagnostic tests, etc

(Drummond et al., 2015). The indirect costs incurred by the patient include opportunity cost, which is the equivalent value of time and productivity lost for both the patient and family/caregiver when accessing health services (Drummond et al., 2015). Lastly, if the costs accounted for are exclusively incurred by the health provider, it means the provider perspective is being employed. Examples of cost items included in the provider perspective are buildings, salaries of doctors, medical equipment, computers and etc. Many of the costing studies opt for the provider perspective than the societal and patient perspective (Drummond et al., 2015). In the parenting study for parents and their adolescent children between the age of 10 and 17 years, the provider perspective would include all necessary costs incurred by the implementing agency in the process of providing the interventions. The societal perspective involves all the provider and patient costs incurred within this sector (Gray et al., 2010).

Table 5: Perspectives in economic evaluation, adapted from the guidelines for the economic evaluation of health technology, (Canadian, Agency for Drugs and Technologies in Health, 2006)

Perspective				Type of cost	Example
Societal	Public Sector/ Government			Direct costs to publicly funded services (other than health care)	Social services, such as home help, meals on wheels* Income transfer payments paid (e.g., disability benefits) Special education
		Health services Sector	The publicly funded healthcare system	Direct costs to publicly funded health care provider may include contributions from International donors and similar agencies	Labour expenses Medications Recurrent costs Medical products Capital costs Maintenance for machineries like vehicles and physical structures like buildings Medical Equipment Vehicles Equipment for the lab Instructional resources Overheads: Telephone, electricity, and water utilities; administration;
			Patients	Direct costs to patients and their families	Out-of-pocket costs for consultations, medications, treatments, etc., including co-payments. Expense of traveling for medical care. Caregivers who get paid
				Indirect costs to patients and families	Time spent by patients traveling and getting care. income loss as a result of illness Lost time by patients and family members at paid and unpaid jobs (like housework) Lost productivity: the time spent by patients receiving care and their families

2.6.2. Identification of important resources

The Identification, measurement, and valuation of the resources that are used in the interventions are the steps in costing study when considering the study perspective (Brouwer W, 2001). The Identification of costs is informed by the type of perspective considered for the study and if the societal perspective is employed, both patients and provider costs shall be included in the study (Brouwer W, 2001). However, if a societal perspective is adopted, only costs incurred by the service

provider shall be considered (Brouwer W, 2001). The study, which employs a patient perspective, also restricts costs incurred only by the patients (Drummond et al., 2015).

Redfern (2018) indicated that the Parenting for Lifelong Health costing study that was conducted in South Africa opted for the provider perspective. The costs that were identified were divided into three categories: Set costs which consisted of community engagements, recruitment of study participants, and training facilitation (Redfern, 2018). The second category was the program delivery costs which consisted of the time of staff dedicated to the program, transportation, staff time devoted to mentoring facilitators, and program monitoring tools like enrolment forms, attendance registers, and participant checklist for the facilitator (Redfern, 2018). The last category was the overhead costs which consisted of costs related to running the office like rent, utilities, and management support incurred by the service provider over the entire period of implementation (Redfern, 2018).

2.6.3 Measurement of resource use

According to Drummond (2015), when measuring the resources used in health interventions, there are two costing approaches. The first costing approach is micro-costing, and this costing approach is also referred to as ingredient costing. The second costing approach is gross costing which is also referred to as macro costing. It is incumbent upon the analysts to judge the extent of accuracy of the costing analysis According to (Drummond,2015).

Table 6 below illustrates the different levels of precision in cost for a hospital as an example.
The micro-costing is considered the most precise method of costing since it encompasses thorough Identification as well as the measurements of health interventions to determine the quantities of required resources for accurate estimates (Drummond et al., 2015). As much as the micro-costing is costly and tedious, it is much simpler and seamless to execute in the economic evaluation as a sub-study to the RCT since patients' data is easily accessible (Drummond et al., 2015). Macro-costing is a top-down costing approach that is used to analyse data at an aggregate level, and it is less problematic to generalize the findings compared to the micro-costing results, even though gross-costing is less precise (Drummond,2015).

Table 6: Levels of precision in costing, adapted from Drummond et al., 2015Table 2.2: Levels of precision in costing analysis, Adapted from Drummond et al., 2015.

Precision	Method
Most Precise  **Least Precise**	**Micro-costing** *The average daily cost, which calculates the diem across all categories is a common practice, in healthcare systems. It involves estimating the cost of each resource used, such as lab tests, ward stays, medications and physician consultations and determining the unit cost for each. This method utilizes patient information for episodes*
	Case-mix group *Using this method, the cost of a case or hospital patient is assigned to each category. considers the duration of the stay. The degree of detail in defining the different case types determines the precision.*
	Disease-specific per diem (or daily cost) *provides the average daily cost of each disease category's treatments.* *These might still be fairly general (Heart transplant surgery, is a perfect example).*
	Average per diem (or daily cost) *calculates the per diem average for all patient categories. offered in most healthcare systems*

2.6.4 Valuation of resource use

In the valuation of resource use, the financial costs which have to do with costs where resources are paid for may be employed. However, in economic evaluations, analysts employ economic cost for resource valuation, which takes into consideration the opportunity costs for purposefully making use of the resource (Vassall et al., 2017)

Across the globe, community-based programs are implemented by volunteers using resources that are donated by other institutions. Therefore, the volunteers' time and donated resources should be valued even though there were no financial transactions (Drummond et al., 2015).

2.6.5 Valuation of non-market resource inputs

In economic evaluation, the main non-market resource inputs to health care interventions and programs are volunteer time and opportunist cost for patient/family leisure time (Drummond et al., 2015). An approach is assessing volunteer time is to determine rates of remuneration based on market wage rates (Drummond et al., 2015). Another approach to valuing volunteer time compensation is to estimate the burden of informal care on the caregivers. A study was conducted using a longitudinal database from Australia to evaluate the impact of informal care on the well-being of caregivers, and the study managed to report monetary estimates (Van den Berg et al., 2014).

2.6.6 Cost categorization

In an economic evaluation study, all resources used on the health intervention under investigation are classified into two categories: capital and recurrent costs (Drummond et al., 2015). Capital costs related to items that have a lifespan or are used beyond the period of a year, like a furniture, vehicles, and buildings (Drummond et al., 2015). However, recurrent costs are represented by items that have a lifespan of less than a year, like insurance, staff salary, maintenance, and water (Drummond et al., 2015).

Table 7: Categories of costs in cost analysis of programs (Johns at al., 2003)

Recurrent Costs	
A.1 Personnel	The amount of staff time allotted to each intervention is netted against the time that individual spent on other interventions. The total cost of all taxes and fringe benefits paid by the employer to the employee is known as the labor cost. Per diems and travel expenses are included in this. The pay rate of the medical staff members who would normally be hired to complete the task should be used to calculate the cost of voluntary labor. The value employed in non-skilled labor depends on the location. The value of labor would account for lost production in rural areas where the majority of the population would typically work in agriculture or fishing, taking seasonality into account. The annual incomes of the urban informal sector can be utilized in urban areas.
A.2 Materials & Supplies	In this category, the total costs are calculated by multiplying the number of materials and supplies by the relevant unit cost. The perfect example of such materials, promotional materials like printed mugs
A.3 Media operating costs	The unit costs of each media outlet, such as the minutes for radio advertisements or the quantity of ads per size for each kind of publication, are used to include all costs.
A.4 Transport operating costs	Transport cost is determined by calculating the amount of kilometers traveled, depending on the nature of transport that was used. In some instances, train, bus or taxi fare get included as part of transport cost.
A.5 Equipment operating cost	There are instances where program equipment is hired from elsewhere. If this is the case, the equipment will be multiplied by the number of months and the total cost should be multiplied by the amount of equipment.
A.6Maintenance	Buildings, vehicles, equipment should be serviced and maintained in accordance with the manufacturer's specifications, hence the maintenance costs should be included.
A.8 Building Rental costs	Total cost for renting a building are determined by the number of square meters occupied and the duration of rental.
Capital cost	
B.1 Building	In instances where the program is utilizing the building, the total number of square meters occupied by the program are reported and total cost will depend of the cost of using the building per square meter.

B.2 Transport	This cost category includes vehicle costs purchased for the program. The percentage of time the vehicles are used by the program will be computed to determine the cost.
B.3Equipment and implements	This section includes information on the quantity of office equipment, distribution and storage, upkeep, cleaning, and other capital equipment. If they are only partially utilized, appropriate allocation is made; this allocation may follow the same parameters as those applied to the construction of building space, or it may be based on how much time is spent in relation to other programs.
B.4 Furniture	The same allocation factor that is applied to the cost of building space or equipment is also applied to the cost of furniture.

2.6.7 Discounting and annuitization

According to Wondering (2005), discounting is a technique of adjusting the value of costs that transpire in different time periods into a common time period, usually the present. Under normal circumstances, most people place different values on outcomes and costs that occur in the future and now. People prefer to enjoy the health outcome in the present and pay for the health interventions in the future. The discounting and annuitisation methods in the valuation of capital assets like furniture, land, buildings, and vehicles are employed to account for the positive time preference. Valuation of capital costs uses the replacement value of the good (Walker and Kumaranayake, 2002). Annuitisation means adjusting the initial cost of the capital and recurrent costs taking into consideration the depreciation and spreading the cost over the life of the project (Wondering, 2005). In the absence of a discounting rate provided in the jurisdiction where the study is conducted, the choice of the discount rates could be sourced from published literature, which is between 3% to 5% per annum (Drummond et al., 2015). Since the discount rate is subjective, a sensitivity analysis is used to determine if the change in the discounting rate has an impact or influences on the outcome of the costing study (Drummond et al., 2015).

Walker et al. (2002) advanced that annuitization is computed using the inputs for capital and recurrent costs. Using depreciation, which is the replacement value of the capital good divided by the expected useful life, is one method of calculating annuitization. In order to determine the equivalent annual cost, a different method of evaluating the capital good involves estimating the average depreciation and the interest of the undepreciated portion over the capital item's useful life. The formula below, depicts how the equivalent annual cost is calculated:

In the equation used to derive E, the equivalent annual cost is as follows;

$$E = \frac{K-(s/(1+r)^n}{\mathrm{A(n,r)}}$$

Where,

E = equivalent annual cost

K = purchase price / initial outlay

S = resale value

n = the useful life of the asset

r = discount (interest) rate

A (n, r) is the annuity factor which is given by

$$\frac{1-(1+r)^{-n}}{\mathrm{r}}$$

According to Walter et al. (2022), the replacement costs could be employed for old goods, and the above formula can be utilized for new goods.

2.6.8 Overhead costs

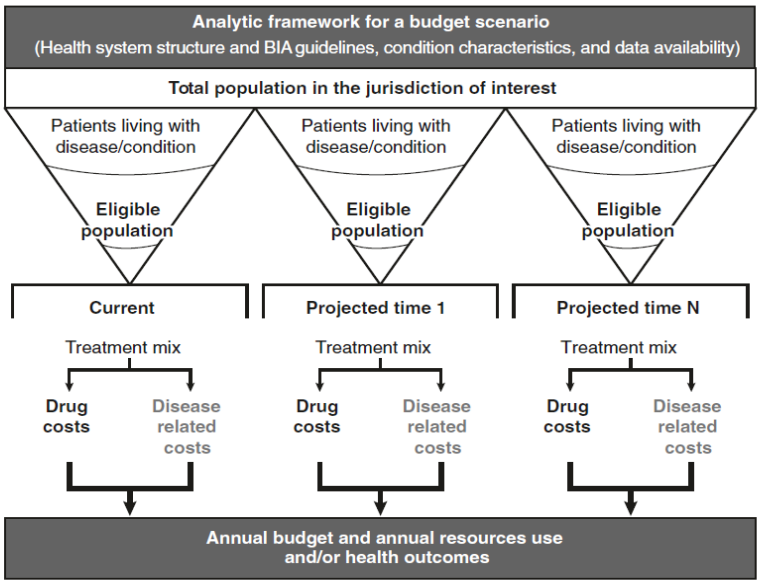
Overhead costs are the costs that support the entire organization and are not directly linked to the production of a specific service like water and electricity for the hospital. When allocating overhead costs for departments that serve to support the production of service, the methods that can be employed are direct methods, stepdown, simultaneous allocation, and reciprocal method (Leelahavarong, 2014).

2.7 Budget Impact Analysis

According to UK Health Security Agency (2021), Budget Impact Analysis (BIA) is a tool of analysis that is instrumental in investigating the possible changes in the expenditure of the health service budget owner emanating from implementing a new health intervention. Countries are beginning to recognize the value of the Budget Impact Analysis (BIA) as a critical factor in the determination of the future scale-up of the newly introduced interventions. According to Leelahavarong (2014), BIA is helpful in determining the feasibility of accepting a new intervention by assessing the affordability of such an intervention because resources and budgets are not limitless. Budget-impact analyses take into consideration every person who is eligible for the intervention, including all patients who would be eligible within the area targeted for the implementation of the intervention and the jurisdiction of the

budget (Mauskopf, 2017). The main elements that assist us in comprehending the jurisdiction when conducting BIA are the eligible population within the jurisdiction, budget holder time horizon, potential use of the new drug within the treatment mix, and budget holder cost perspective. The framework and flow diagram for the BIA are shown below (Maurauskopf, 2017).

Figure 1: Conceptual diagram for completing budget-impact analysis adapted from Mauskopf (2017)



According to Mauskopf (2017), In Fig. 1, the conceptual diagram depicts the required calculations used to estimate the budget impact of existing and new or future interventions. The analytic framework necessitates comprehension of the health system under review as well as how the health system characteristics relate to each other (Mauskopf, 2017), Most importantly, the analytical model also requires an understanding of how the new intervention impacts the budget for a specific program or region. According to Mauskopf (2017), the following segments are key in understanding a jurisdiction when constructing a budget-impact analysis:

- Eligible population within the jurisdiction
- Budget holder time horizon
- Potential use of the new drug within the treatment mix
- Budget holder cost perspective

The fundamental difference between the Cost-Effectiveness Analysis and the Budget Impact Analysis is that the Cost Effectiveness Analysis studies the value for money presented by the new intervention compared to other existing health interventions (Mauskopf,2017). However, Budget-Impact Analysis is used in estimating the impact of the newly introduced new health intervention intended for the eligible population in a specific jurisdiction (Mauskopf,2017).

There is limited Budget Impact Analysis measuring the impact of parenting programs on the national health budget. For parenting programs, no published Budget Impact Analysis was found in the literature search. However, there are three Cost Effectiveness Analysis studies that were conducted on parenting programs (Nystrand et al., 2019; Sampaio et al., 2018; Redfern et al.,2018)

3.0. Literature review search strategy

To carry out this literature review, key words like Parenting, maltreatment, micro costing, cost analysis and budget impact analysis were identified, and their definitions were determined. Other terms and phrases were included as equivalents of the initial and intermediate outcomes like "economic evaluation", "financial impact", "cost estimate". Due to emphasis on health economics, databases such as PubMed, EconLit, NHS Economi Econectric Evaluation Databse (NHS EED), and the Health Economic Evaluation Databases (HEED) were searched. While searching for these journals, various features offered by such databases were used in a bid to narrow down their results. Publication date, study type and language then had to be used to narrow down the search for such literature as may be deemed relevant.

3.1. Conclusion

The reviewed literature entailed the impact of child maltreatment and violence on the lifelong health of children as well as the costs and cost-effectiveness of implementing parenting programs. There was sufficient literature on parenting programs found during the literature search. However, there was limited literature on costs and cost-effectiveness of parenting programs. Some of the relevant literature found related to parenting program costing were from 1995 to 2022. There were few studies from high-income countries. Over and above the articles included from both high income and LMICs+, there were books and articles about the economic evaluation and the budget impact analysis included in the literature review.

The literature review has immensely contributed to the comprehension of the impact of child maltreatment on the health of adolescents. The literature review has also provided insight into the costs and cost-effectiveness of various parenting programs implemented to prevent child maltreatment across the globe. In conclusion, in Botswana there was no literature on parenting program costing studies that was found, hence it is crucial to conduct PLH costing study.

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PART C: JOURNAL ARTICLE

ABSTRACT

Background: Given all its detrimental effects, child abuse is one of the biggest public health issues. Depression, suicidal thoughts, risky sexual behaviour, and substance abuse are a few examples of these effects. The random control trials was conducted in 25 nations with low to middle incomes, including Botswana. The goal of the PLH SUPER study is to address and stop child abuse in environments with limited resources. The overall and unit costs of the PLH program and the BIA, should it expand to national levels, were estimated by this PLH SUPER sub-study.

Methodology: Micro-cost analysis was performed from April 2021 until March 2022, taking the provider perspective to make a computation on the total and unit costs of enrolling families in the PLH program. The target population of the teenagers of age 10–17 and their guardians were the aimed group in Botswana, and the BIA was subsequently determined through the unit cost per family enrolled.

Results: The results exposed variation in every PLH program implementation cost across centres, from US $22,771.96 in Goodhope, to US $60,662.82 in Gaborone. The unit cost per enrolled family ranged from US $168.68 in Goodhope, to US $336.91 Letlhakane. Personnel costs accounted for 64% of total expenditure. The PLH enrolment coverage projected at 5.7% and 40,525 families identified as the programs target population for national scale-up. The cost per family enrolled in the PLH program ranged from US $168.68 to US $336.91, per family. Therefore, the total budget needed for expanding the PLH program varies from US $6,835,788.61 to US $13,653,186.67

Conclusion: This study investigated the cost implication of nationally scaling-up PLH interventions in Botswana. The findings of this study present the decision makers with guidance on the possible costs that could be incurred in scaling-up the PLH interventions countrywide. Furthermore, the study also guides policy makers on how the national scale-up could impact the existing health and wealth budget. This study immensely contributes on the global discourse on prevention of maltreatment. Lastly, Cost Effectives Analysis study for rolling out PLH interventions in Botswana is highly recommended.

Key Words

Parenting; maltreatment; micro costing; cost analysis; budget impact analysis

BACKGROUND

According to WH0 (2002), violence encompasses the use of force or authority, whether as a threat towards another individual or a community. Such actions have the potential to result in harm, including injury, loss of life, psychological distress, impaired development or deprivation. Maltreatment refers to any action or failure by a caregiver or parent that causes harm or poses a risk of harm to a child. This type of mistreatment can occur in environments such, as homes, schools, institutions or communities where the child's present (World Health Organization, 2002).

Globally, the issue of violence against children and youth presents a challenge, affecting around one billion children annually ((UNICEF, 2020). Alarmingly, more than 120 million adolescent girls and young women under the age of 20 experience coerced sexual interactions each year (UNICEF, 2020). The impact of violence is disproportionately felt in LMICs, where 90% of cases worldwide occur and the mortality rate related to these incidents, is 2.5 times higher than in high income nations (Matzopoulos et al., 2008). In countries that are members of the World Health Organization (WHO), instances of child abuse and interpersonal violence tend to rise during adolescence (Matzopoulos et al., 2008)

To tackle this problem, a successful approach to decreasing violence, involves preventing child abuse by implementing proven parenting programs. The Parenting for Lifelong Health (PLH) research project is an effort that brings together experts from organizations, such as the WHO, UNICEF and Clowns Without Borders South Africa (CWBSA), with the aim of creating and expanding affordable, culturally suitable parenting techniques in developing regions.

In order to introduce the PLH program in Botswana, it is crucial to have resources, hence conducting an assessment is necessary to determine the cost implications of expanding the program nationwide. This research seeks to explore the feasibility of expanding the PLH program across Botswana for people aged 10 to 17 and their families by calculating both total and unit costs linked to program national roll-out.

METHODS

Study design.

This study involved conducting an analysis of costs and BIA from provider perspective. Data on financial costs was collected from an organization that was implementing PLH, to calculate total as well as the unit costs. Information was gathered through interviews with informants working in this organization, providing insights for the analysis. Financial records were also received, reviewed, and analysed to determine how much it took to implement the PLH program over 12 months.

When assessing the budget implications of expanding the PLH program throughout Botswana, total and unit costs of implementing the PLH program were calculated. Consequently, unit costs were used as the tool, for conducting the BIA. This process involved examining the financial consequences of expanding the program nationally. Population coverage estimates were computed and based on the unit cost, the estimated cost of scaling up PLH interventions were calculated. By utilizing unit costs, a detailed and precise evaluation was conducted, contributing to a grasp of the factors to consider when scaling up the PLH program in Botswana.

Study setting and population.

Botswana, located in the heart of Southern Africa and bordered by Zimbabwe, Zambia, Namibia and South Africa, has a population of 2.5 million people. Just like many other countries in Africa, Botswana is also burdened with cases of child maltreatment. Many cases of maltreatment that happen at home in Botswana are not reported because they are often seen as insignificant matters (MLG&RD, 2019). The research covered regions in Botswana such as Gaborone, Goodhope, Gantsi, Letlhakane, Kgatleng and Tutume.

Gaborone serves as both the capital and largest city in Botswana. Good Hope is a village, acting as the centre for the Goodhope sub district in the Southern District. In the part of Botswana, within the Kalahari region, lies Ghanzi town, which brings diversity to the study. Letlhakane is where the Boteti sub district administration headquarters are located, in Mmatshumo. Kgatleng district headquarters, can be found in Mochudi. Lastly, Tutume sits in the district, fifty kilometres from Zimbabwe's border.

Stepping Stone International (SSI) has been managing the PLH initiative across all six canters since 2018. Each PLH centre, is staffed with project coordinators and community-based facilitators who execute duties like recruitment and enrolment of families that are not apprehensive to participate in PLH sessions. The program focused on adolescents aged 10 to 17 years and their parents. Notably, while direct costing data was not collected from the target group, financial records were sourced from SSI. Data collection took place from April 2021 to March 2022 providing a view of the aspects tied to PLH program implementation. Privacy and confidentiality were priorities during data collection to ensure that information collected from the six sites did not include any details of PLH project participants. Furthermore, usage data was collected to support a cost analysis, for an assessment of the programs financial landscape.

Description of the PLH interventions

PLH is a program focused on promoting parenting practices to prevent violence in areas with limited resources, particularly in Low- and Middle-Income Countries (LMICs) as per the World Health

Organization (WHO, 2020). Founded in 2012 by a collaboration of organizations such as WHO, UNICEF, Oxford University, the University of Cape Town, and the University of Stellenbosch, PLH aims to reduce child maltreatment through evidence-based approaches in LMICs (Steinert et al. 2018). The main goal of the PLH initiative is to empower parents and caregivers to create nurturing and safe environments for their children through parenting methods (Steinert et al. 2018). This program helps enhance knowledge, skills, mental well-being, and overall parenting capabilities to establish a family setting that protects children from physical, emotional and psychological harm (Cluver et al. 2016)

The target audience for the PLH program consists of parents and their children between the ages of 10 and 17. Participants are required to attend fourteen sessions that address psychological and social factors influencing family relationships. (Steinert et al. 2018). Trained community members, Social Auxiliary Workers (SAWs) and lay workers lead PLH family sessions after completing a one-week PLH facilitation training. If participants are unable to attend in person, they can benefit from home-based sessions. These weekly sessions, designed for 12–16 caregiver adolescent pairs last, around 3–4 hours (Steinert et al., 2018).

Costing methods

In this study, the ingredient approach was utilized to calculate intervention costs across the six centres implementing the PLH program in Botswana (Conteh and Walker, 2004). As illustrated in Table 8 below, both capital costs (covering building, furniture, equipment, and procedure training) and recurrent costs (encompassing personnel, medical supplies, overheads, and maintenance) were incorporated into the analysis.

Table 8: Methods and data used in estimating costs: Identifying and measuring recurrent costs.

TYPE OF COST	IDENTIFICATION		MEASUREMENT		VALUATION	
Recurrent cost	Categories	Costing method	Related information for allocation purposes	Source of data	Valuation methods	Source of data
Administration & management	Management and administration staff	Document staff time on different activities Total remuneration package costs. Any external costs	Number of sessions attended by families.	Time sheets and record reviews	Gross salary per month, including benefits (Cost to company)	NGO salary packages
Overheads	Electricity, water and other utilities Rent (where applicable) Telephones, faxes & postage Stationery, computer consumables & photocopies Printing programme handbook Support staff (all staff not classified as community worker, admin. and management, or maintenance)	Actual costs from facility records In case of support staff, total remuneration package	Number of sessions attended by families	Expenditure reports	Expenditure records	Expenditure records
Program personnel:	Project Manager M&E Manager Data Captures Community Based Workers	Total remuneration costs Calculate separately for each category of personnel listed in previous column	Number of sessions attended families	Time sheets and record reviews	Gross salary per month, including benefits (Cost to company)	NGO salary packages
Transport/ Vehicle running costs	Sedan (Purchased/ leased	Number of kilometers travelled in a year. AA rate per kilometer	Number of sessions attended by families.	Observation, transport records	Expenditure records	Transport contracts and records
Maintenance		Actual costs of supplies related to maintenance activities. Total remuneration costs of maintenance staff External costs	Number of sessions attended by family	Observation, record reviews	Tender contract prices and expenditure records	Department of Public Works, Supply Chain Management: records and contracts, clinic expenditure records

Table 9: Methods and data used in estimating costs: Identifying and measuring capital costs.

TYPE OF COST	IDENTIFICATION		MEASUREMENT		VALUATION	
Capital costs	Categories	Costing method	Related information for allocation purposes	Source of data	Valuation method	Source of data
Building	Office Space Rented venues	Current replacement cost per m^2 x square meter of facility). 30-year life span. 3% discount or annuitization	Space (square meters)	Record reviews	Replacement and contract prices or rent.	Department of Public Works, building contractors Supply Chain records for hiring venues for sessions.
Furniture and other equipment	Tables, chairs, cabinets,	Actual current replacement cost. 10-year life span for furniture and 5-year life span for equipment 3% discount rate for annuitization	Resources used by each cost Centre. Number of employees	Record reviews	Replacement and contract prices, rental fees	Department of Public Works, Supply Chain Management: records and contracts
Vehicles		Actual current replacement cost. 6-year life span. 3% discount rate for annuitization	Number of home visits Logbooks/time spent travelling for program related activities	Transport records	Replacement and contract prices, rental charges	Transport contracts and records
Initial Training	Training of community-based workers training on PLH program	Actual current cost of training. 2-year life span. 3% discount rate for annuitization	Number of staff trained. Time spent on different services by these staff. Number of consultations per type of service	Management, training records	Course fees; for in-house training – staff remuneration	Training Providers, remuneration packages

The data collection process, for PLH costing at six centres, took place between April 2021 and March 2022 excluding training expenses. An interview was conducted with the program manager in charge of operations to gain insights into PLH program activities. Financial records from SSI, were examined to assess the resources utilized. In instances where PLH shared a building with other programs within the organisation, building costs were determined by calculating the proportion of space used by PLH staff compared to the building utilized by SSI across all six centres.

The total building space was multiplied by the replacement cost per square meter to determine building costs. Equipment and furniture costs used by the PLH implementing agency were obtained from SSI procurement records and asset registers while training cost data was sourced from SSI training reports. Capital costs were spread out over time using a 3% discount rate. Personnel costs were calculated based on time spent on activities, such as recruiting program beneficiaries, conducting PLH sessions, conducting home visits, managing cases, attending meetings and maintaining records. Support personnel time was also considered on the cost analysis.

The study used both down and bottom-up approaches, for unit cost calculation. The top-down approach involved breaking down the expenses in each cost category by the utilization rate while the bottom-up approach identified resources utilized in interventions per cost category, which were then combined to determine unit costs. The costs per family enrolled in the program were calculated. All expenses were stated in Botswana Pula (BWP) using 2021/2022 salary and price data converted to United States Dollars (USD) with an exchange rate of 1US$ = 12.82 BWP as of December 29, 2022.

The budget impact analysis employed a Microsoft Excel expenditure-based model in a two-step process. Initially it estimated the population for the intervention by assessing the prevalence of maltreatment in Botswana. Focusing on adolescents aged 10 to 17 the annual cost of the program was determined based on the projected number of adolescents for 2023. In Botswana, an estimated 30% of all adolescents face violence (Ministry of Local Government and Rural Development, 2019) The main goal was to evaluate implementation costs at varying coverage rates within Botswana. By forecasting enrolment numbers for adolescents and families at coverage levels under the program, it aimed to offer insights, into its viability considering resources.

Assumptions

Since this PLH costing study is conducted from provider prospective, we assume: 1) That the targeted population of the adolescents who are eligible for PLH interventions is representative of the number of adolescents that suffer maltreatment in Botswana; 2) That the targeted adolescent and their

caregivers will agree to be enrolled to the PLH program and complete all 14 sessions until they graduate; 3) Based on the prospective nature of the study, we assume that government will support the scale up of the PLH program in Botswana.

Data Analysis

A Microsoft Excel model based on costs was utilized to analyse the data regarding costs. The cost, per family who were enrolled to the PLH program at each implementation centre were determined by dividing the total cost by the number of families enrolled from between April 2021 and March 2022

RESULTS

Overall cost estimates

Throughout the period under investigation, individuals numbering 270, 135, 135, 135, 267, and 135 were respectively enrolled in the Parenting for Lifelong Health (PLH) program in Gaborone, Goodhope, Gantsi, Letlhakane, Kgatleng, and Tutume. This enrolment distribution is presented in Table 10 for reference.

Table 10: Total cost of families enrolled in PLH in US $ (2022)

Cost category	Gaborone	Goodhope	Gantsi	Letlhakane	Kgatleng	Tutume	Total
RECURRENT COSTS							
Personnel	$34,436.17	$13,240.25	$24,160.69	$34,243.37	$25,742.59	$25,742.59	$157,565.66
Printing family guides	$716.07	$716.07	$716.07	$716.07	$716.07	$716.07	$4,296.41
Airtime allowance	$59.91	$0.00	$0.00	$0.00	$0.00	$0.00	$59.91
Stationery and papers	$0.00	$0.00	$0.00	$0.00	$0.00	$234.01	$234.01
Transportation allowance	$2,433.70	$1,123.24	$842.43	$4,680.19	$842.43	$842.43	$10,764.43
Graduations ceremony	$4,212.17	$780.03	$780.03	$780.03	$1,432.14	$780.03	$8,764.43
Venue Hire	$0.00	$0.00	$0.00	$0.00	$1,684.87	$0.00	$1,684.87
PLH Snacks	$10,109.20	$1,684.87	$842.43	$1,684.87	$14,826.83	$1,684.87	$30,833.07
Overheads	$6,022.66	$1,141.97	$1,872.07	$1,310.45	$4,348.83	$936.04	$15,632.03
Total recurrent costs	**$57,989.88**	**$18,686.43**	**$29,213.73**	**$43,414.98**	**$49,593.76**	**$30,936.04**	**$229,834.81**
CAPITAL COSTS							
Buildings	$488.07	$2,530.79	$1,156.91	$128.52	$157.85	$202.46	$4,664.59
Equipment & furniture	$965.74	$335.62	$1,188.89	$720.03	$1,429.51	$325.44	$4,965.22
Procedure training	$1,219.13	$1,219.13	$775.81	$1,219.13	$1,662.44	$664.98	$6,760.61
Total capital costs	**$2,672.93**	**$4,085.53**	**$3,121.60**	**$2,067.67**	**$3,249.80**	**$1,192.88**	**$16,390.42**
Total Cost	**$60,662.82**	**$22,771.96**	**$32,335.33**	**$45,482.65**	**$52,843.56**	**$32,128.91**	**$246,225.23**

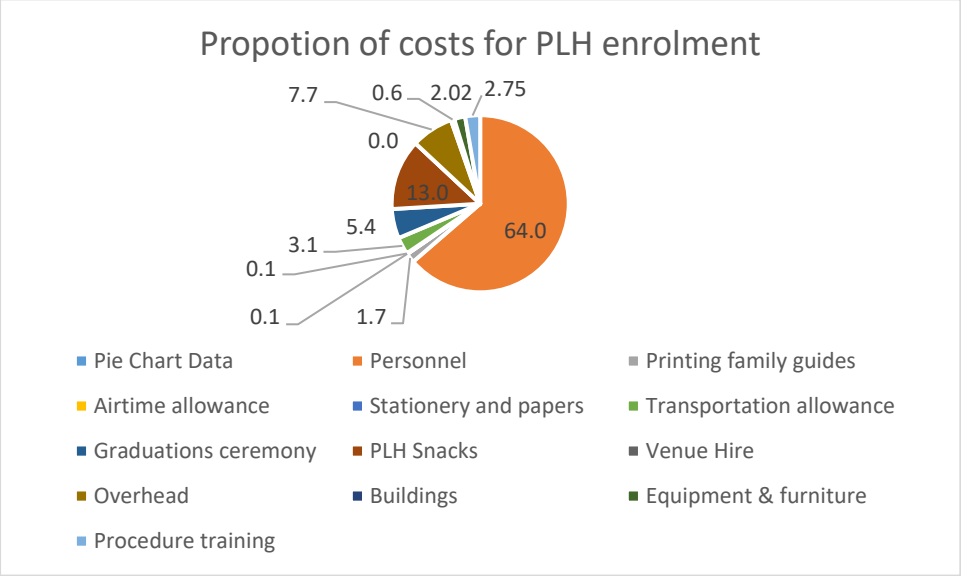
In Table 10, we can observe that the overall expenses, for implementing the PLH across all six implementing sites from April 2021 to March 2022 amounted to US $246,225.23. Notably, Gaborone recorded the spending at US $60,662.82, while Goodhope had an expenditure of US $22,771.96 for

PLH implementation. It is important to highlight that personnel costs were the significant cost input at US $157,565.66 compared to other cost categories. The costs for implementing the PLH program ranged from US $22,771.96 to US $60,662.82, per location.

Table 11: Unit costs per family in US $ (2022)

	Gaborone	Goodhope	Gantsi	Letlhakane	Kgatleng	Tutume
	n=270	n=135	n=135	n=135	n=267	n=135
COST CATEGORY						
RECURRENT COSTS						
Personnel	127.54	98.08	178.97	253.65	95.34	190.69
Printing family guides	2.65	5.30	5.30	5.30	2.65	5.30
Airtime allowance	0.22	0.00	0.00	0.00	0.00	1.73
Transportation allowance	9.01	8.32	6.24	34.67	3.12	6.24
Graduations ceremony	15.60	5.78	5.78	5.78	5.30	5.78
PLH Snacks	37.44	12.48	6.24	12.48	54.91	12.48
Overheads	22.31	8.46	13.87	9.71	16.11	6.93
Venue Hire	0.00	0.00	0.00	0.00	8.32	0.00
Total recurrent costs	**214.78**	**138.42**	**216.40**	**321.59**	**185.76**	**229.16**
CAPITAL COSTS						
Buildings	1.81	18.75	8.57	0.95	0.58	1.50
Equipment & furniture	3.58	2.49	8.81	5.33	5.29	2.41
Procedure training	4.52	9.03	5.75	9.03	6.16	4.93
Total capital costs	**9.90**	**30.26**	**23.12**	**15.32**	**12.04**	**8.84**
Total Unit Cost per family	**224.68**	**168.68**	**239.52**	**336.91**	**197.80**	**237.99**

Figure 2: Proportion of costs of PLH enrolment in Botswana.



While Figure 2 reveals the share of costs for implementing the PLH program in Botswana between April 2021 and March 2022 for six centres, cost categories are clearly expressed in percentages. The biggest portion of funds were expensed on personnel costs, which represented 64.0% of the entire budget. This dimension underlines the importance of human resources in the program's implementation. The lowest proportion of expenses were observed on cost categories like printing family guides at 0.7% as well as stationery which accounted 0.1% of the total cost of implementing PLH program over a year. Graduation ceremonies as an aspect of the PLH program, only accounted for 5.4% of the total cost. PLH snacks account for 13.0% of the budget, accentuating the need to offer meal support during sessions. The lowest venue hires costs at 0.0% was observed, since there was only one Centre which rented venues at US $1,684.87 per year.

Operating expenses, which make up 7.7% of the total cost, bears a significant role in supporting the day-to-day activities and management of the program. The costs related to buildings, equipment & furniture and training procedures collectively make up 3.37%, highlighting the importance of investing in infrastructure and training to ensure the program runs effectively. To sum up, personnel, snacks for PLH graduation ceremonies and operating expenses are areas where financial resources were significantly expensed while each of the remaining categories accounted for less than 10% of the total cost.

Budget impact analysis (BIA)

Budget Impact Analysis calculates the financial effects of implementing new medical technology or interventions in a given financial environment. Decision-makers use it as a crucial tool to evaluate the possible financial impact of implementing new healthcare interventions or technologies (Sullivan et al., 2014). In this case, the data is specific, to Botswana. This study provides information on aspects such as total families, coverage for families eligible for the PLH program and the total population targeted for enrolment and consequently, the estimated total costs. The analysis focuses on Botswana considering a total of 710,963 families. The PLH enrolment coverage stands at 5.7% of the total households in Botswana amounting to 40,525 families estimated for initial scale-up. The cost per family enrolled in the PLH program, ranges from US $168.68 to US $336.91, per family enrolled. Therefore, the total budget needed for expanding the PLH program varies from US $6,835,788.61 to US $13,653,186.67 (refer to Table 12 below).

Table 12:Estimated expenditure of enrolling a family on PLH in US $ (2022)

Country	Total families	PLH enrolment coverage (%)	Population to be enrolled	Lowest Cost	Highest cost
Botswana	710,963	5.7%	40,525	$6,835,788.61	$13,653,186.67

Standard Bank Botswana (2022) reported that yearly health and wellness budget stood at US $788 million, and this allocation demonstrates a dedication to tackling healthcare issues in the country. The portion of the budget required for expanding the PLH program falls within the range between 0.86% and 1.75% of the total health and wellness national budget.

DISCUSSION

WHO, the University of Cape Town, University of Stellenbosch, UNICEF, Oxford university and Clowns Without Borders South Africa initiated the PLH SUPA study to investigate the feasibility of implementing the PLH in low resource settings. This costing study was conducted in support of the PLH SUPA study, focussing on Botswana. The aim of the study is to determine the affordability of scaling up the PLH program in Botswana. The first objective of the study was to estimate the total and unit costs of the PLH program. The second objective was to determine the budget impact of nationally scaling-up the PLH program. Thid costing study findings exhibited variations in implementation costs across regions, with some areas having higher costs than others. The study underscored the significance of investing in program personnel. These results lay the groundwork for exploring how these findings can influence program planning, resource allocation and efficient scaling up of the PLH program in regions. The data provided insights into expanding the PLH program by examining how recurrent and capital expenses are allocated among components. It was noteworthy that 64% of costs were allocated to personnel highlighting the role played by resources in ensuring successful program implementation. These results underscored a need for workforce planning and investment to enhance scaling up efforts. While other cost categories collectively made up 36% of expenses it is important to emphasize that these categories are essential for implementation of the PLH program.

The outcomes, from budget impact analysis (BIA) contribute to understanding the implications and potential outcomes associated with introducing the PLH program in Botswana. Tailored data specific to the country, offers insights into aspects such as the number of families and the target population for program involvement. The estimated costs, which range from US $6.8 million to US $13.7 million provide an overview of the situation. These findings, underscore the importance of considering different scenarios for resource allocation and risk management. By presenting a range of costs, a nuanced understanding is facilitated, supporting contingency planning and risk reduction efforts.

These findings from the BIA underscore the significance of finding a balance between coverage goals and sustainability as a basis for planning and strategic decision making.

LIMITATIONS

The data for this study was collected from one NGO which was implementing the PLH program in Botswana. Consequently, the applicability of this cost estimation and budget impact analysis study is limited to Botswana and not generalisable to other settings beyond Botswana.

CONCLUSION

The results of the study suggest the cost of scaling up PLH constitute between 0.86% and 1.75% of the total health and wellness budget, hence the scale up should not have major negative implication by reducing other government health and wellness programs. However, the future research focussing on the cost-effectiveness analysis of the PLH programs is highly recommended.

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PART D: POLICY BRIEF

POLICY BRIEF **January 2024**

PARENTING FOR LIFELONG HEALTH PROGRAMME FOR PARENTS AND TEENS IN BOTSWANA: COST ESTIMATION AND THE BUDGET IMPACT ANALYSIS

Cost and budget impact of nationally scaling-up the PLH programme.

Child abuse is strongly connected to consequences, like feeling sad, thinking about suicide, engaging in risky sexual activities and using drugs (1). Furthermore, the effects of child abuse can also lead to sexual transmitted infections, cancer and heart problems (2). Most Importantly, people who have been mistreated as children are more likely to struggle and may not finish school. Moreover, adults who have encountered violence, in their early years, are more likely to become violent themselves (3).

The Parenting for Lifelong Health (PLH) program is designed to help parents and caregivers create a safe environment for their children using parenting techniques. This research focused on calculating the expenses involved in enrolling families in the PLH program in Botswana and evaluating the costs of nationally expanding this initiative.

INTRODUCTION

Any action or neglect directed at a child by a caregiver or parent that causes harm or poses a threat of harm is identified as maltreatment, and such abuse can transpire at home, school, in various organizations, or within communities interacting with the child (5).

Globally, violence against children and youth poses a significant challenge. Approximately one billion children experience violence annually, with over 120 million adolescent girls and young women under the age of 20 encountering forced sexual contact (6,7). The burden of violence is particularly reported in Low and Middle-Income Countries (LMICs), accounting for 90% of global cases, and the mortality rate related to violence is 2.5 times higher than in high-income countries (8).

An effective way to reduce violence is, by preventing child abuse through proven parenting programs. The Parenting for Lifelong Health (PLH) initiative was created through collaboration between researchers from countries, WHO, UNICEF, University of Cape Town, Oxford University, University of Stellenbosch and Clowns Without Borders South Africa (CWBSA) to develop and expand culturally suitable parenting models in developing nations. To successfully introduce the PLH program in Botswana, securing support is crucial. Therefore, conducting an assessment is necessary to understand the budget impact of implementing the program. This assessment will offer insights, into the viability of long-term sustainability and potential resource needs for extending the PLH program throughout the country.

Parenting for Lifelong Health

Parenting, for Lifelong Health (PLH) is a program focused on promoting parenting practices to prevent violence. Launched in 2012, the PLH is an evidence-based initiative developed by a collaboration involving the WHO, UNICEF, Oxford University, the University of Cape Town and the University of Stellenbosch. Its main aim is to reduce child maltreatment in LMICs.

The primary goal of the PLH program is to empower caregivers and parents to create a nurturing and protective environment for their children through parenting techniques. This effort plays a role in enhancing the knowledge, skills and mental well-being of parent pairs while establishing a supportive family setting that safeguards children and adolescents from various forms of abuse.

The PLH program targets parents and their children aged between 2 to 17 years old. It involves parents/caregivers and children

participating in fourteen sessions that are carefully crafted to address social aspects with an added focus, on improving parental financial management skills.

Trained community workers oversee the workshops, for parents after completing a one-week training program in PLH facilitation. Those unable to attend in person can still benefit from sessions held at home. These weekly meetups accommodate 12–16 caregiver pairs. Typically, the sessions last around 3–4 hours per session. The PLH random control trial study was conducted in 25 LMICs. This costing study is a sub-study to the PLH SUPA study, focussing on Botswana.

ABOUT THE STUDY

This study examined the records from six centres where the PLH program was carried out under the management of Stepping Stone International (SSI). Our goal was to understand the costs involved in enrolling and supporting families, within the PLH program. The centres analysed were located in Gaborone, Goodhope, Gantsi, Letlhakane, Kgatleng and Tutume. It's important to mention that a non-governmental organization (NGO) oversees the implementation of the PLH program in all these locations. To assess the impact we calculated both total and unit cost per family participating in the program, consisting of a caregiver/parent and teenagers aged between 10 and 17 years. Our detailed examination delved into the aspects of running the PLH program across sites highlighting variations in costs and resource distribution, among these centres.

KEY FINDINGS

- Implementing the PLH program had varying costs at centres ranging from $22,771.96 in Goodhope to around $60,662.82 in Gaborone.
- The cost per family enrolled differed from about $168.68 in Goodhope to around $336.91 in Letlhakane with personnel expenses making up about 64% of the total costs. The PLH program aimed to cover 5.7% of families targeting 40,525 families with associated costs ranging from $6,835,788.61 to $13,653,186.67.
- Budget Impact Analyses indicated that scaling up the PLH program would make up between 0.86% and 1.75% of the overall health and wellness budget. The study findings highlighted that enrolling and graduating a family on PLH incurred costs compared to what was available, in the local government budget.
- The BIA showed that expanding PLH services in Botswana would account for 0.86% to 1.75% of the health and wellness budget.
- The study indicated that the expenses associated with enrolling on PLH are significantly lower when taking into

account the existing budget constraints.

POLICY RECOMMENDATIONS

- Considering the differences, in expenses among various centres, decision makers should consider a thoughtful approach to distributing resources.
- It might be wise to prioritize centres with costs like Gaborone to ensure fair access and effectiveness.
- Decision makers ought to explore ways to optimize expenses related to staff, which make up a part of the budget. This could involve negotiating cost staff contracts considering volunteer involvement or improving the efficiency of staff related procedures.
- To adjust to changing limitations decision makers should establish a program evaluation system. Regular evaluations of cost effectiveness, program efficiency and impact will support informed decision making.
- Allow for adjustments, in budget priorities related processes.
- Due to evolving market conditions in Botswana, decision makers should innovatively initiate continuous program evaluation. It is highly recommended for Botswana government to conduct continuous cost effectiveness analysis of the PLH interventions in order to guide their budgeting priorities.

CONCLUSION

This study investigated the cost implication of nationally scaling-up PLH interventions in Botswana. The findings of this study present the decision makers with guidance on the possible costs that could be incurred in scaling-up the PLH interventions countrywide. Furthermore, the study also guides policy makers on how the national scale-up could impact the existing health and wealth budget. This study immensely contributes on the global discourse on prevention of maltreatment. Lastly, Cost Effectives Analysis study for rolling out PLH interventions in Botswana is highly recommended.

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PART E: APPENDICES

APPENDIX 01: GUIDE FOR AUTHORS: BMC PUBLIC HEALTH JOURNAL

Research article

BMC Public Health journal

Criteria

Research articles should report on original primary research or new experimental or computational methods, tests or procedures. Manuscripts reporting results of a clinical trial must conform to CONSORT 2010 guidelines. Authors of randomized controlled trials should submit a complete CONSORT checklist alongside their manuscript, available at www.consort-statement.org. Research articles may also report on systematic reviews of published research provided they adhere to the appropriate reporting guidelines which are detailed in our editorial policies. Please note that non-commissioned pooled analyses of selected published research and bibliometric analyses will not be considered. Studies reporting descriptive results from a single institution or region will only be considered if analogous data have not been previously published in a peer reviewed journal and the conclusions provide distinct insights that are of relevance to a regional or international audience.

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Preparing your manuscript

The information below details the section headings that you should include in your manuscript and what information should be within each section.

Please note that your manuscript must include a 'Declarations' section including all of the subheadings (please see below for more information).

Title page

The title page should:

- present a title that includes, if appropriate, the study design e.g.:

- "A versus B in the treatment of C: a randomized controlled trial", "X is a risk factor for Y: a case control study", "What is the impact of factor X on subject Y: A systematic review."
- or for non-clinical or non-research studies a description of what the article reports

- list the full names and institutional addresses for all authors.
  - if a collaboration group should be listed as an author, please list the Group name as an author. If you would like the names of the individual members of the Group to be searchable through their individual PubMed records, please include this information in the "Acknowledgements" section in accordance with the instructions below.
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- indicate the corresponding author.

Abstract

The Abstract should not exceed 350 words. Please minimize the use of abbreviations and do not cite references in the abstract. Reports of randomized controlled trials should follow the CONSORT extension for abstracts. The abstract must include the following separate sections:

- Background: the context and purpose of the study
- Methods: how the study was performed, and statistical tests used
- Results: the main findings
- Conclusions: brief summary and potential implications
- Trial registration: If your article reports the results of a health care intervention on human participants, it must be registered in an appropriate registry and the registration number and date of registration should be in stated in this section. If it was not registered prospectively (before enrolment of the first participant), you should include the words 'retrospectively registered'. See our editorial policies for more information on trial registration.

Keywords

Three to ten keywords representing the main content of the article.

Background

The Background section should explain the background to the study, its aims, a summary of the existing literature and why this study was necessary or its contribution to the field.

Methods

The methods section should include:

- the aim, design and setting of the study.
- the characteristics of participants or description of materials
- a clear description of all processes, interventions and comparisons. Generic drug names should generally be used. When proprietary brands are used in research, include the brand names in parentheses.
- the type of statistical analysis used, including a power calculation if appropriate.

Results

This should include the findings of the study including, if appropriate, results of statistical analysis which must be included either in the text or as tables and figures.

Discussion

This section should discuss the implications of the findings in context of existing research and highlight limitations of the study.

Conclusions

This should state clearly the main conclusions and provide an explanation of the importance and relevance of the study reported.

List of abbreviations

If abbreviations are used in the text, they should be defined in the text at first use, and a list of abbreviations should be provided.

Declarations

All manuscripts must contain the following sections under the heading 'Declarations':

- Ethics approval and consent to participate.

- Consent for publication
- Availability of data and materials
- Competing interests
- Funding
- Authors' contributions
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Data availability statements can take one of the following forms (or a combination of more than one if required for multiple datasets):

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- The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.
- All data generated or analysed during this study are included in this published article [and its supplementary information files].

- The datasets generated and/or analysed during the current study are not publicly available due [REASON WHY DATA ARE NOT PUBLIC] but are available from the corresponding author on reasonable request.
- Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.
- The data that support the findings of this study are available from [third party name] but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of [third party name].
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Hao Z, AghaKouchak A, Nakhjiri N, Farahmand A. Global integrated drought monitoring and prediction system (GIDMaPS) data sets. figshare. 2014. http://dx.doi.org/10.6084/m9.figshare.853801

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Acknowledgements
Please acknowledge anyone who contributed towards the article who does not meet the criteria for authorship including anyone who provided professional writing services or materials.

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Rohrmann S, Overvad K, Bueno-de-Mesquita HB, Jakobsen MU, Egeberg R, Tjønneland A, et al. Meat consumption and mortality - results from the European Perspective Investigation into Cancer and Nutrition. BMC Medicine. 2013; 11:63.

Article within a journal by DOI

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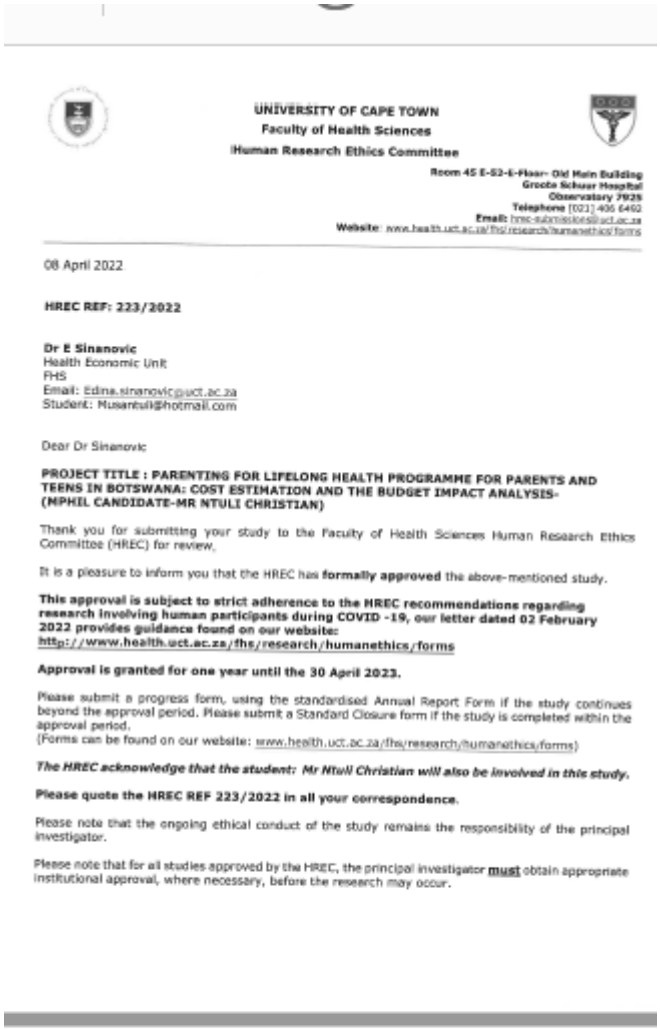
APPENDIX 02: ETHICAL CLEARANCE FOR PARENTING FOR LIFELONG HEALTH PROGRAMME FOR PARENTS AND TEENS IN BOTSWANA: COST ESTIMATION AND THE BUDGET IMPACT ANALYSIS



UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee

Room 45 E-52-E-Floor- Old Main Building
Groote Schuur Hospital
Observatory 7925
Telephone (021) 406 6492
Email: hrec-submissions@uct.ac.za
Website: www.health.uct.ac.za/fhs/research/humanethics/forms

08 April 2022

HREC REF: 223/2022

Dr E Sinanovic
Health Economic Unit
FHS
Email: Edina.sinanovic@uct.ac.za
Student: Musantuli@hotmail.com

Dear Dr Sinanovic

PROJECT TITLE : PARENTING FOR LIFELONG HEALTH PROGRAMME FOR PARENTS AND TEENS IN BOTSWANA: COST ESTIMATION AND THE BUDGET IMPACT ANALYSIS- (MPHIL CANDIDATE-MR NTULI CHRISTIAN)

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee (HREC) for review.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

This approval is subject to strict adherence to the HREC recommendations regarding research involving human participants during COVID -19, our letter dated 02 February 2022 provides guidance found on our website:
http://www.health.uct.ac.za/fhs/research/humanethics/forms

Approval is granted for one year until the 30 April 2023.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.
(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

The HREC acknowledge that the student: Mr Ntuli Christian will also be involved in this study.

Please quote the HREC REF 223/2022 in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval, where necessary, before the research may occur.

Yours sincerely

PROFESSOR M BLOCKMAN
CHAIRPERSON, FACULTY OF HEALTH SCIENCES HUMAN RESEARCH ETHICS COMMITTEE
Federal Wide Assurance Number: FWA00001637. Institutional Review Board (IRB) number: IRB00001938 NHREC-registration number: REC-210208-007
This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use: Good Clinical Practice (ICH GCP), South African Good Clinical Practice Guidelines (DoH 2020), based on the Association of the British Pharmaceutical Industry Guidelines (ABPI), and Declaration of Helsinki (2013) guidelines. The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.

APPENDIX 03: ETHICAL CLEARANCE FOR PARENTING FOR LIFELONG HEALTH (PLH) SCALE-UP OF PARENTING EVALUATION RESEARCH (SUPER).

UNIVERSITY OF CAPE TOWN

Department of Psychology

University of Cape Town Rondebosch 7701 South Africa
Telephone (021) 650 3417
Fax No. (021) 650 4104

26 May 2020

Catherine Ward
Department of Psychology
University of Cape Town
Rondebosch 7701

Dear Catherine

I am pleased to inform you that ethical clearance has been given by an Ethics Review Committee of the Faculty of Humanities for the amendment for your study, *Parenting for Lifelong Health (PLH) Scale-Up of Parenting Evaluation Research (SUPER)*. The reference number will remain the same PSY2017 -040.

I wish you all the best for your study.

Yours sincerely

Debbie Kaminer
Associate Professor
Acting Chair: Ethics Review Committee