

Is Mental Health and Psychosocial Support (MHPSS) cost effective? An economic evaluation among Congolese refugees in the Kyaka II community in Uganda

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Abstract

Background: Mental health is a global public health issue. Mental health disorders can develop in anyone, but the prevalence is higher among refugees. Mental Health and Psychosocial Support (MHPSS), aims to improve mental health and is commonly applied among persons from conflict-afflicted settings such as, refugees. There are several studies demonstrating the effectiveness of MHPSS but there are limited studies on its cost-effectiveness.

Purpose: The purpose of this study is to determine if a MHPSS intervention among Congolese refugees and some Ugandans living in and around the Kyaka II refugee camp in Uganda, is cost-effective compared to a ‘do-nothing approach’ and to determine if this effect differs over sex, age, refugee status, MHPSS type, and project funder.

Methods: A Cost-Effectiveness Analysis (CEA) will be conducted from the societal perspective. The main outcome of interest is mental health measured via the Self-Report Questionnaire-20 (SRQ-20), measured pre and post intervention. The cost analysis is performed by analyzing financial expenditure reports and conducting interviews. The effectiveness is determined by the mean raw score change in the SRQ-20, the number of recovered participants, and Hedges G effect size. A multivariable regression at a 95% confidence level, is used to determine differences in effect based on sex, age, refugee status, MHPSS type and project funder.

Findings: The total cost of the intervention is \$704,038 USD and the cost per participant is \$281. The SRQ-20 score decreased by 12.7 points and 88 percent of participants recovered. The cost per unit reduction in the SRQ-20 is \$22 per participant and at a cost of \$331 one participant will recover. Only sex had a statistically significant effect on the outcome, but the ICER differs minimally between females and males.

Conclusions: Based on WHO’s CHOICE framework for arguing cost-effectiveness and comparative literature, the intervention is cost-effective at an ICER of 22 USD.

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Abbreviations

CEA	Cost-Effectiveness Analysis
CBT	Cognitive Behavioral Therapy
DIGNITY	Danish Institute Against Torture
DRC	Democratic Republic of the Congo
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
IASC	Inter-Agency Standing Committee
ICER	Incremental Cost-Effectiveness Ratio
ILO	International Labor Organization
LMICs	Low- and middle-income countries
MHE	Mental Health Examination
MHPSS	Mental health and psychosocial support
PM+	Problem Management Plus
PPP	Purchasing Power Parity
PTSD	Post-Traumatic Stress Disorder
QALY	Quality-Adjusted Life-Years
SRQ-20	Self-Report Questionnaire-20
ToC	Theory of Change
TPO	Transcultural Psychosocial Organization
UGX	Ugandan Shillings
UNHCR	United Nations High Commissioner for Refugees
USD	United States Dollar
VPA	Volunteer Psychosocial Assistant
WHO	World Health Organization
WHO-CHOICE	World Health Organization Choosing Interventions that are Cost-Effective

Introduction

Mental health disorders are one of the top ten leading causes contributing to the global burden of non-communicable diseases (1). The World Mental Health Report by the World Health Organization (WHO), states that about one in eight people live with a mental health disorder such as Post-Traumatic Stress Disorder (PTSD), depression or anxiety (2). However, one out of three refugees experience PTSD, depression and anxiety (3, 4). A refugee is any person forced to flee their country and cannot return due to fear of persecution (5). In 2024, there were 39.7 million refugees worldwide (6). It is due to the challenges refugees, asylum-seekers and internally displaced people face during pre-flight, during flight and during resettlement in a host country that they experience poor mental health (4). Mental health is a vital competent to achieving good overall health and allows for a person to achieve well-being and combat daily stressors, which are especially important for refugees (7). The journey refugees take, due to fear of their lives and families lives, is not one without challenges, as they carry trauma from conflict-afflicted areas they've escaped and then are presented with further distress while trying to resettle in a foreign and unfamiliar country (7).

Background

According to the United Nations High Commissioner for Refugees (UNHCR), in 2024 Uganda was hosting up to 1.74 million refugees, from a variety of neighboring countries but notably the Democratic Republic of the Congo (DRC) (8). For the past thirty years the DRC has been in an ongoing humanitarian crisis, involving tensions in the Kivu region and a civil war that has led to torture and Sexual and Gender-Based Violence (9). This, along with an eruption of violence in 2017, has caused the displacement of tens of thousands of Congolese people, to Kyaka II, a refugee camp in the Kyegegwa district of Uganda (9, 10). The situation in Kyaka II is a protracted crisis, where refugees from the DRC have been living in Kyaka II for more than five consecutive years, and experience both mental health and livelihood challenges (9, 11). In the fifth report of the Global Evidence Review on Health and Migration series by the WHO, it examined the protective and risk factors for mental health in refugees (7). One overarching theme was basic needs and security, including income, housing and employment (7). In Kyaka II reliance on aid is common, and opportunities to improve livelihoods are limited, due to restrictions for leaving the camp and its rural location that makes the search for better

employment opportunities difficult (9). Furthermore, a field study published in 2023 by the Danish Institute Against Torture (DIGNITY) investigating the protective and risk factors of mental health among adult refugees in Kyaka II, revealed seventy-five percent experience PTSD and depression (10). It is both the violence Congolese refugees experienced in the DRC, while fleeing DRC, and the livelihood difficulties in Kyaka II that contribute to a high prevalence of mental health problems among Congolese refugees and the continued protracted crisis in Kyaka II (9, 10).

One way to treat mental health distress is Mental Health and Psychosocial Support (MHPSS). Mental Health and Psychosocial Support is an umbrella term that represents any kind of mental health care or support that targets persons' well-being and treats or prevents mental health disorders, mainly applied in humanitarian and emergency settings (12). The MHPSS model follows a theoretical framework through the Theory of Change (ToC) (13). Theory of change is used to demonstrate how a program should produce a change and reach its goals (outcomes) through specific actions and strategies. The MHPSS ToC focuses on reaching the following outcomes: participation, human rights, leadership and governance, promotion of wellbeing and community interventions, and prioritization of emergencies and MHPSS in Fragile and Conflict Settings (13). It emphasizes investing in community-based MHPSS approaches, addressing stigma, communicating with policymakers and increasing financial and human resources for MHPSS (13). Furthermore, the Inter-Agency Standing's Committee (IASC) guidelines on delivering MHPSS in emergency settings demonstrate the application of MHPSS through a pyramid (see Figure 1).

Figure 1

The IASC MHPSS pyramid demonstrates how MHPSS should be applied as a package in humanitarian contexts. The pyramid can be used for example, during the influx of refugees into a refugee settlement. Once basic needs are met such as shelter and food, and support systems in the community are established, focused psychosocial treatments should be delivered and if warranted, specialized care for those who need it (12). At each level of the pyramid, access to mental health care services is imperative to the protection of refugees' well-being (12). The IASC also recommends that MHPSS be integrated with methods to build livelihood skills to drive economic development and self-reliance among people in emergency situations (12, 14). In

line with the MHPSS ToC and IASC's MHPSS pyramid, MHPSS can come in a variety of forms, and has been implemented in many kinds of settings, producing different results. Prior studies have shown that some forms of MHPSS can be beneficial for people in emergency settings and humanitarian crises, mainly refugees and displaced people who are survivors of torture. However, given the different contexts in which MHPSS is applied and the different forms it can take, its effectiveness should be consistently evaluated (15).

Mental health among refugees is a worldwide public health problem that deserves more attention and investigation into comprehensive solutions. It is estimated that between the years 2011 and 2030 mental health disorders will result in an estimated global cost of \$16.3 trillion (7, 9). Economic evaluations can be used to determine if public health programs, for example, programs to improve refugees' mental health are cost-effective by comparing the costs and relevant health outcomes which aid decision-makers in deciding where to allocate important and relatively scarce resources for health (16). Currently, there is a lack of economic evaluations evaluating the cost-effectiveness of mental health care, specifically among refugees living in low-resource settings (17). Evaluating if proposed public health interventions are cost-effective is especially important in low-resource settings, where there is a lack of aid, for example, in refugee settlements (18). In this study, the public health intervention of focus, is a MHPSS intervention delivered to Congolese refugees living in Kyaka II, as well some Ugandans neighboring the settlement.

Aim and research questions

The aim of this study is to analyze if a MHPSS intervention delivered to Congolese refugees and Ugandans living in and nearby Kyaka II, is cost-effective compared to a do-nothing approach through a Cost-Effectiveness Analysis (CEA) from the societal perspective, and to determine if the effect differs based on sex, age, refugee status, MHPSS type and project funder. This will be determined by answering the following research questions:

1. What is the total cost of the intervention?
2. What is the effectiveness of the MHPSS intervention?
3. Is the MHPSS intervention **cost-effective**?

Prior research

As mentioned before, MHPSS is used to help people from conflict-afflicted settings such as refugees. There is a lot of research regarding the use of MHPSS in these settings (12, 15). One systematic review and meta-analysis of MHPSS programs in humanitarian emergencies and low- and middle-income countries (LMICs), resulted in thirty-five studies that demonstrate improved functioning and reduction in PTSD symptoms (15). A few of those studies were delivered in refugee camps – Eye Movement Desensitization and Reprocessing among Syrian refugees in Turkey, two Narrative Exposure Therapy studies among refugees in Uganda, one Interpersonal Psychotherapy program among Sudanese refugees in Egypt and a Common Elements Treatment Approach among Burmese refugees in Thailand, all of which demonstrated positive results (15, 19, 20, 21, 22, 23). However, the MHPSS strategies are clearly different and specific, producing diverse results based on the context in which the MHPSS is delivered.

While extensive research goes into investigating the effectiveness of MHPSS, regarding cost-effectiveness, the research is often limited. One systematic review for economic evaluations evaluating cost-effectiveness of mental health care among refugees and displaced people from conflict-afflicted settings resulted in 11 articles (17). For example, one CEA evaluating a Randomized Controlled Trial of adults with severe psychological distress in Pakistan who received Problem Management Plus (PM+) compared to usual standard of care, illustrated a large improvement in anxiety, depression and daily functioning at a Incremental Cost-Effectiveness Ration (ICER) of 53,770 Pakistan Rupees per treated case of depression, but this cost would decrease if local providers were used (24). Another study evaluating the cost-effectiveness of stress management among Syrian refugees in Turkey compared to enhanced usual care, found the program to be cost-effective at a cost of 6,068 Turkish Lira per Quality-Adjusted Life-Years (QALY) gained (25). However, a CEA of a bio-psycho-social intervention among war victims in Kosovo, was not cost-effective based on WHO guidelines at an intervention cost of 10,508 euros per QALY gained (26). The systematic review also provided economic evaluations from asylum-seekers in high-income countries such as, Denmark, the Netherlands and Germany demonstrating the lack of economic evaluations of MHPSS in LMICs or in humanitarian emergencies (17).

Description of the intervention

The intervention at the focus of this study is a MHPSS intervention delivered to Congolese refugees and some Ugandans living in and around the Kyaka II community, located in the rural Kyegegwa district of southwestern Uganda. The majority of those living in Kyaka II are Congolese refugees but some Ugandans living around Kyaka II are included in the intervention because, it is a requirement, and Ugandans also struggle with poverty and mental health. The intervention ran over twenty-three months between 2022 and 2024. Some participants in the study were part of the project that is funded by the Danish Institute Against Torture (DIGNITY), and other participants were part of the project that is funded by the UNHCR. There are two different project funders because, in the DIGNITY project, participants will go on to receive economic empowerment after graduation from MHPSS, while those from the UNHCR project only receive MHPSS. However, this study focuses only on evaluating the cost-effectiveness of the MHPSS only.

Participants were recruited through community-based awareness campaigns and screenings. The Transcultural Psychosocial Organization (TPO) team in Uganda are the ones who provide this intervention. The TPO team created community-based awareness campaigns in the form of psycho-education sessions, radio talk shows streamed on “Kyaka FM”, t-shirts, banners, posters, flyers, stickers with key messages, and broadcasting pre-recorded audio messages to raise awareness on trauma, mental health and MHPSS options. Furthermore, training sessions for social workers and Volunteer Psychosocial Assistants (VPAs) were held to ensure that the community-based awareness campaigns and psycho-education sessions were culturally appropriate, gender-sensitive and inclusive. These trainings were necessary as a previous study showed that cultural norms among Congolese and Ugandans, can lead to stigma around mental health – so it’s important the MHPSS messaging is culturally appropriate (10). Volunteer Psychosocial Assistants are people who have a high school level education and are responsible for mobilization of participants, translation, identification and referrals of arising MHPSS cases in the settlement. Community leaders and facilitators also participated in training for delivering these community-based awareness activities. The community-based awareness activities led to self-referrals from potential participants, or participants were referred by members of the TPO field team for a mental health screening, based on hotspots they had mapped for mental distress in Kyaka II. Tracking hotspots for mental distress in Kyaka II was done through referral mapping, and the team participated in training sessions to learn about mapping mental hotspots

through referral pathways. After referral, participants were sent for a screening which was done through a Mental Health Examination (MHE). In the MHE a data collection tool called the Self-Report Questionnaire (SRQ-20), is presented on a tablet to participants. The SRQ-20 measures levels of distress based on scales of anxiety, depression and trauma. The screenings were conducted by a social worker with the assistance of a VPA and a supervising clinical psychologist, who helped guide participants through the twenty-question survey (27) (see Appendix A). Each of the twenty items on the SRQ-20 receives a score of 0 (symptom absent) or 1 (symptom present), so the total score can range from 0 to 20 (28). A score of seven or higher on the SRQ-20 indicates mental distress, and means the participant qualified to receive MHPSS (based on TPO's guidelines for MHPSS programming). There were 2497 participants who scored seven or higher on the SRQ-20 and qualified for MHPSS.

The MHPSS strategy involved two different approaches –Cognitive Behavioral Therapy (CBT) and Problem Management Plus (PM+). A further PTSD measure and depression screening was used to help determine severe psychological distress among participants versus mild to moderate psychological distress. Participants with severe psychological distress would receive CBT and participants with mild to moderate psychological distress would receive PM+. A total of 2,189 participants were referred to CBT and 308 referred to PM+. Cognitive behavioral therapy is a psychological treatment used to enhance coping mechanisms, improve psychological well-being, promote self-awareness and use cognitive restructuring to increase positive thoughts and decrease negative thoughts. Cognitive behavioral therapy was ten sessions, 60-90 minutes each, with 12-15 individuals per group, over ten weeks. Problem management plus assists individuals with stress management, basic helping skills, problem management and behavior activation to improve low mood and inactivity. Problem management plus was five sessions, 60-90 minutes each, with 8-12 individuals per group held over five weeks. Both types of sessions were conducted by a social worker with assistance from VPAs and supervision of a clinical psychologist. Mental Health and Psychosocial Support providers went through training on how to deliver the MHPSS appropriately. Whether an interpreter (VPA) was present during the sessions varied based on if the social worker spoke Kiswahili (refugees) or Rutooto (language of host population). The MHPSS sessions were held in venues that were determined by the participants such as a community church, tree shades, households, or a community hall. Some of the materials used to facilitate the sessions were meals and refreshments, stationery,

tablets and manuals. Mental health examinations (SRQ-20) were also performed upon graduation from MHPSS, to record outcomes. In Appendix B an index from TPO depicting all the activities delivered to all participants can be reviewed.

Methods

In this study a Cost-Effectiveness Analysis (CEA), will be used. A CEA measures cost in monetary value and the outcome is a health measure of interest for both the intervention and comparator (29). One result is an Incremental Cost-Effectiveness Ratio (ICER) demonstrating the difference in cost and effectiveness between the intervention and comparator, represented as cost per participant per unit of outcome (29). The CEA will be conducted from a societal perspective, which is the broadest perspective and accounts for all costs and benefits regardless of who is paying for them and who will benefit (29). The economic evaluation will follow the guidelines as established by Drummond's checklist from "methods for the economic evaluation of health care programs" (30).

Comparator

Every economic evaluation has a comparator, which is generally the current standard practice or a 'do nothing approach' (29). In this study, there is a possibility of standard care which is represented by someone in the refugee settlement being aware of mental health services and having the means to access them. However, a field study among adult refugees living in Kyaka II showed that while there are health services in the settlement, many are not able to access such services due to lack of awareness, cost, time of transportation and stigma (10). For example, eighty-three percent of households reported living with someone that experiences mental distress and are not able to access services, and majority don't know such services exists, or do not seek care due to fear of prejudice (10). Due to the difficulties determining if persons can access standard care and not knowing what kind of care that would be in Kyaka II, this study uses a 'do nothing approach' as the comparator.

Outcome

The outcome of interest is mental health measured through the SRQ-20, a tool developed by the WHO which assesses mental health such as anxiety, trauma and depression through twenty

simple questions (27) (see Appendix A). The SRQ-20, was given to participants during screening and recruitment before the intervention, and post-intervention.

Time horizon

The period of this intervention is two years between 2022 to 2024. Cognitive Behavioral Therapy runs for ten weeks at a time, and PM+ is five weeks at a time. Post SRQ-20 assessments were given a year or less after MHPSS and therefore, costs are not discounted.

Sample

The total sample in the cost analysis is 2497 participants reached and enrolled into MHPSS, 931 participants were a part of the DIGNITY project and 1,566 a part of the UNHCR project. However, in the effect analysis only 2401 participants are included, because 96 participants were lost to follow-up or dropped out resulting in no post SRQ-20 score.

Data collection

To collect data on costs, financial expenditure reports from DIGNITY and TPO Uganda were reviewed on Excel. After examining the expenditure reports, Q&A sessions and interviews were done with TPO to clarify the relevant activities, salaries, resources used and other cost details. There were also discussions with DIGNITY's project manager to clarify terminology in the expenditure report. To collect data on the outcome, social workers, VPAs and a supervising clinical psychologist guided participants through the SRQ-20 via tablets during screening and recruitment (pre), and upon completion of MHPSS (post). Data on demographic and other descriptives were also collected via tablets. For example, variables such as age, sex, refugee status, MHPSS type and project funder will be summarized for the 2401 who completed MHPSS and the 96 lost to drop-out or follow-up, as well as the average pre SRQ-20 score and average post SRQ-20 score. All data was individual-level data and stored in a system called KoboToolbox, which is a confidential data and collection tool that can be used offline and is primarily utilized in humanitarian emergencies (31).

Cost analysis

The CEA is conducted from the societal perspective, pricing all the costs needed to deliver the intervention regardless of who pays for them. The financial expenditure reports

showed activities, salaries, and other resources used for the intervention. Based on the discussions with TPO, the costs were organized into the following cost categories – screening and recruitment, MHPSS and operational costs. Screening and recruitment represent costs for training in referral mapping, and materials and equipment needed for community-based awareness campaigns i.e. banners, t-shirts, flyers, etc. It also involves costs for screening, such as, tablets and costs for transportation. The MHPSS category includes the direct costs for conducting the MHPSS sessions (both for CBT and PM+) and the training sessions for the MHPSS providers i.e. – stationery, meals and refreshments, vehicle maintenance and transport refunds for the participants. The operational costs include the indirect costs for all the personnel involved and internet and communication. Personnel were costed based on the human-capital approach, and therefore valued based on what the personnel are paid for their productivity. This was based on their salary and allocations for medical insurance, GPA (accident insurance), 13th month (end of year bonus), 10 percent National Social Security Fund, and eight percent Provident Fund (retirement). The cost categorization and analysis were done via Excel and the detailed description of costs for each cost category and corresponding costs can be found in Appendix C. The total cost and the average total cost per participant were generated for each cost category. The prices were reported in Ugandan Shillings (UGX) and exchanged into United States Dollar (USD) using Purchasing Power Parity (PPP) conversion factor of 1,178.37, from the year 2022 (32). The PPP conversion factor is from 2022 because that was the year the projects began, and the budgets were allocated. The ‘do-nothing approach’ comparator is costed at zero, as no intervention is given in the alternative, assuming no one has access to a usual form of mental health care. The costs between the Congolese refugees and Ugandans are not differentiated because, the costs were collected via expenditure reports which did not separate costs for these groups. It is assumed that the costs are the same for everyone, as everyone received in the MHPSS in the same quality and manner, which is checked via a multivariable regression analysis.

Statistical analyses

All statistical analyses are done via SPSS version 29 and assessed at a 95% confidence level. First, descriptive statistics (age, sex, refugee status, MHPSS type, project funder and average pre and post SRQ-20 scores) are summarized for the graduated sample (N=2401) and the

sample lost to drop out or follow-up (N=96). Any statistically significant differences between graduated participants and those lost, are determined through an independent sample t-test for continuous variables, and a chi-squared test for categorical variables. The effectiveness of the intervention compared to a 'do-nothing approach' is determined in a few different ways. These ways are, the mean raw score change in pre and post SRQ-20 scores, the number of participants who 'recovered' by scoring below a 7 (the cut-off score) on the SRQ-20 during post-assessment, and Hedge's G effect size. Hedges G represents a standardized effect size commonly used in psychology and is determined by both mean difference and a pooled and weighted standard deviation. While Hedges G can determine effect size, it is not used in economic evaluations to demonstrate an effect, therefore it will not be used to calculate an ICER. Lastly, a multivariable regression is conducted to determine if there exists a statistically significant effect on the change in SRQ-20 after controlling for sex, age, refugee status, MHPSS type and project funder. From the multivariable regression, the variables which produce a statistically significant difference in the outcome, will be further used in a sub-group ICER analysis, to demonstrate if this causes changes in the ICER.

Cost-effectiveness analysis

Incremental Cost-Effectiveness Ratios (ICERs) will be calculated using the effects from the mean raw score change in the SRQ-20 and the number of participants who recovered. The average cost per participant will be divided by the mean raw score change resulting in one ICER, and the total cost of the intervention will be divided by the amount of recovered participants, resulting in another ICER.

Sensitivity analysis

Sensitivity analysis is used to check important assumptions of the study, to support method choices and determine the robustness of the results. A sensitivity analyses will be conducted to see how the ICER responds to hypothetical changes in certain parameters, which potentially could have been different. In this context three scenarios will be used. First, a one-way sensitivity analysis with an increase and decrease of fifty percent in personnel costs will be conducted. This scenario is used because while the personnel cost is my best estimate, there still exists a slight uncertainty in the personnel costs because there was no way of knowing how much time each personnel spent on the MHPSS activities. The second scenario is a one-way sensitivity

analysis which creates a counterfactual comparator group that follows the assumption that 17% of the sample is aware of a standard form of care, and therefore would seek care and recover from that care. The 17% is based on the field study in Kyaka II which found that 83% of refugees were unaware of mental health care services, therefore 17% could have been aware (10). Finally, a conservative scenario will be conducted with a one-way sensitivity analysis that changes the cost per participant for the MHPSS and operational cost categories. The cost per participant for the MHPSS and operational cost category will be based on the sample of 2401 participants instead of 2497 participants. This is because we do not know if the 96 lost in is due to loss at follow-up or loss to dropout, nor do we know when they dropout. In the base-case scenario, the costs assume that participants are lost to follow-up after they had completed MHPSS, reflected by the 2497 participants used to calculate the cost per participant for the MHPSS and operational cost categories. Therefore, in this one-way sensitivity analysis we now assume that 2497 participants are screened and recruited but, only 2401 participants are in MHPSS because the sample of 96 drops out before beginning MHPSS.

Ethical considerations

Ethical approval is not necessary to conduct an economic evaluation. However, it is necessary for collection of individual-level data for use in statistical analyses. Ethical approval and a research permit were obtained by DIGNITY for collection of the individual-level data. In connection with the thesis, strong General Data Protection Regulation (GDPR) guidelines were followed to ensure data protection of the study participants. Before costs were shared, data sharing agreements were signed, and only officials working through a contract with DIGNITY had access to the outcome data, which was collected at baseline and post-intervention, and was deidentified before use in any statistical analyses. I do not believe this research to be problematic, as research permits were approved and anonymity, confidentiality, and culturally sensitive and trauma-informed practices are emphasized. However, the recommendations generated from the findings in this study can potentially bring up wider ethical implications in the context of Uganda, because mental health is often stigmatized in this context.

Results

Descriptive characteristics

In Table 1 both descriptive characteristics for the 2401 participants who graduated from MHPSS, and the 96 participants lost to drop out or follow-up are summarized. Age is a continuous variable, with ages ranging from 18-81, with an average age of almost 40 years old. Overall majority of both samples are female (close to eighty percent). The average pre SRQ-20 score is 15.5 for the graduated sample and the average pre SRQ-20 score for those lost to drop out or follow-up is 15.32. The average post SRQ-20 score is 2.8 for the graduated sample. The variables age, sex and pre SRQ-20 scores did not produce a statistically significant difference between the graduated sample and those lost to drop-out or follow-up. However, there is a statistically significant difference between the samples for refugee status, MHPSS type and project funder, based on p-values being less than 0.001. For example, only participants in the DIGNITY project were lost to drop-out or follow-up, and those lost to drop-out or follow-up are more likely to be Ugandan and from the PM+ group.

Table 1

Cost analysis

The costs reflected in screening and recruitment involved all material i.e. stationery, meals and refreshments, tablets, transport refunds, vehicle mileage/fuel, hired venues and internet (airtime) needed for spreading MHPSS messaging and community-based awareness activities, and conducting trainings, engagement sessions, psycho-education sessions and MHE screenings. The MHPSS includes direct costs like hired venues for training, meals and refreshments, transport refunds, a laptop for the clinical psychologist, and vehicle mileage and maintenance costs associated with training MHPSS providers, conducting a workshop on delivering trauma-informed and culturally sensitive care, and providing the MHPSS (CBT/PM+). Finally, the operational cost category includes indirect costs like, personnel costs for the personnel involved in screening and recruitment and MHPSS (six VPAs, one clinical psychologist, three social workers) and other personnel involved in delivering the intervention (a monitoring and evaluation officer, field driver, and a program focal person), as well as other uses of airtime. To see the breakdown of the cost categories and detailed costs, see Appendix C. The cost per participant is calculated based on the 2497 graduated participants, assuming everyone completed MHPSS before dropping out or being lost to follow-up. The total cost of the intervention is 704,038 USD or 281 USD per participant. The cost for screening and recruitment

is 65 USD per participant, the cost for MHPSS is 34 USD per participant and the operational cost is 181 USD per participant. To see an overview of the cost analysis see Table 2.

Table 2

Statistical analyses

The effects are summarized in Table 3. The mean raw score change in SRQ-20 between post and pre assessment is 12.7 with a standard deviation of 4.96. A total of 2121 (88%) participants recovered. The resulting Hedges G point estimate was 2.5 – the mean change in SRQ-20 scores from pre to post intervention is 2.5 times larger than the pooled standard deviation of the pre and post scores.

Table 3

In Table 4, results of the multivariable regression are represented. The only variable which had a statistically significant effect on the outcome was sex, at a mean difference of 0.944 and p-value less than 0.001. This means that females had a larger average change in SRQ-20 and improved in mental health more than males did. The other variables did not show a difference in the outcome that was statistically significant.

Table 4

Cost-effectiveness analysis

Based on the costs and effects, the resulting ICER using the mean raw score change is 22 USD, and the ICER based on number of recovered participants is 331 USD (see Table 5).

Table 5

Sub-group ICER analysis

Because sex had a statistically significant effect on the change in SRQ-20 scores, a sub-group ICER analysis stratified by sex was performed. The mean raw SRQ-20 score change for females is 12.9 and the mean raw score change for males is 11.9. The resulting ICER for females is 21 USD and for males the ICER is 23 USD (see Table 6).

Table 6

Sensitivity analysis

In table 7, the three scenarios for the sensitivity analysis are illustrated. In scenario 1, the personnel cost decreasing or increasing by fifty percent caused the ICER to range from 15 to 29 USD per participant based on mean raw SRQ-20 score change, or 227 to 436 USD based on recovery. In scenario 2, a comparator group of standard care which experiences 17% of the participants recovering, results in the base ICER increasing to 411 USD. In scenario 3, changing the costs to reflect the assumption that the 96 participants lost, dropped out before beginning MHPSS causes the ICER to increase from 22.20 to 22.88 USD.

Table 7

Discussion

Summary of findings

Of the 2497 participants which scored seven or higher on the SRQ-20 and qualified for MHPSS, 96 were either lost to follow-up or dropped out, leaving a sample of 2401 participants which graduated from MHPSS. On average, among the graduated participants, the SRQ-20 score decreases by 12.7 points between pre and post assessment and 2121 (88%) participants recovered. The total cost of the intervention is 704,038 USD and the average cost per participant is 281 USD. The resulting ICERs are 22 USD per participant for a one-point decrease on the SRQ-20 and 331 USD is to be paid for one participant to recover (see Table 5). There was a statistically significant difference in the outcome based on sex, showing that females experienced a slightly better improvement in mental health than males (see Table 4). However, based on the sub-group ICER analysis, the ICER values remain relatively similar between females and males – 21 USD for females and 23 USD for males (see Table 6). Overall, the results illustrate that there is a clear decrease in SRQ-20 scores, illustrating an improvement in mental health among the participants.

Based on the summary of the findings above, I would argue that the results are mostly credible with some insecurities. According to TPO Uganda, we do not know if the 96 lost was due to drop-out or loss to follow-up, it could be either. Between the sample of 2401 which graduated and the sample of 96 participants lost, they did not differ based on age, sex or pre SRQ-20 scores. Those who were lost to follow-up or drop-out had a lower average pre SRQ-20 score than the graduated sample. However, there were statistically significant differences in

refugee status, MHPSS type and project funder between these groups. These differences could be explained by the possibility that more Ugandans, those from the PM+ group and all participants from the DIGNITY project are lost to drop-out or follow-up, because it is not uncommon for participants to relocate in search for better economic opportunities, loss due to fear of stigma, or loss due to death. On the other hand, we know that refugees have a higher prevalence of poorer mental health than the general population, PM+ is a therapy for those less psychologically distressed, and those lost to drop-out or follow-up had lower pre SRQ-20 scores, so those lost could have been healthier from the start and therefore not deem therapy necessary for themselves. This opens the opportunity for selection bias, but in the end, we are unsure of the reasons for the loss of 96 participants. I would argue that in the context of a rural refugee settlement, a follow-up sample of 2401 participants is a large enough sample size to establish an effect, and that the loss to follow-up does not affect the results. This is argued also in scenario 3 of the sensitivity analysis, that demonstrates that even if we change the costs to reflect the assumption that those lost never began the MHPSS they were referred to, the ICER changes barely, from 22.20 USD to 22.88 USD. The credibility of the results is further supported by the multivariable regression analysis which demonstrated that age, being Ugandan, receiving PM+ or being a part of the UNHCR project does not have a statistically significant on the outcome (see Table 4). The lack of differences in the outcome between these groups demonstrates that the MHPSS produces an improvement in mental health regardless of these population and provider differences. While it had shown a statistically significant effect for sex, as discussed above, the ICER only differs minimally between females and males.

While the costs and effects are my best estimate, there remain some discrepancies. Firstly, it was not possible to collect information on how much time each of the relevant personnel contributed to the intervention activities. The cost for personnel is possibly overestimated, because the costs are based on yearly salary. The salary costs do not capture the guarantee that each of the personnel is contributing time only to this MHPSS intervention in that year, it's possible they could have been working on other tasks. This discrepancy was accounted for in scenario one of the sensitivity analyses, with a +/- 50% change in personnel costs, which resulted in ICER ranging from 15 USD to 29 USD per participant (see Table 7). I believe that due to this possible overestimation, the ICER could lie somewhere between the lower limit of 15 USD and 22 USD per participant, and therefore the intervention could cost much less for the

same benefit. Also, not all costs could be captured from the societal perspective. Due to the informal economy present in Kyaka II, and potential sources of income coming through activities such as farming, it would be difficult to know what the economic loss is from participants attending the CBT and PM+ sessions, and therefore, this opportunity cost was not accounted for. On the other hand, when we look at the benefits measured in this study, only mental health via the SRQ-20 was measured. However, there are other benefits which could have possibly increased or improved due to MHPSS, such as productivity and measurements for quality of life. I would argue that this intervention would cause an increased benefit in productivity and quality of life, therefore, the benefit could be more and the cost the same, increasing the probability of cost-effectiveness. Regarding the benefit measured in this study, the follow-up SRQ-20 assessment is completed a year or less than a year from the MHPSS intervention, therefore it would be difficult to argue that the MHPSS is sustainable and produces a “long-term effect”. However, waiting longer could have risked even more loss to follow-up. Also, I do believe that the MHPSS sessions give participants the knowledge and tools to help with their own mental distress in the future, but because of the continuous difficult livelihood challenges in this environment, and the fact that funding is not always steady in these situations, the probability of relapsing is moderate. If participants were to relapse after the intervention, this could have implications for the intervention’s long-term cost-effectiveness, but the definition of what is considered a long-term health benefit can also be questioned. In this study, mental health and other health outcome measurements are planned to be taken over a year after the intervention ended, so the discussion of this intervention’s long-term cost-effectiveness is planned in the future. Regarding scenario 2 from the sensitivity analysis, if we had a comparator group which received standard care and 17% of participants recovered, instead of using a ‘do nothing approach’, the ICER would increase significantly (see Table 7). This has implications on the intervention’s cost-effectiveness, but I would argue that the MHPSS should be the standard of care promoted to this population, and since we are unsure if another standard form of care even exists, the base-case scenario is still the best approximation for arguing cost-effectiveness. Lastly, this study does not have a high generalizability because of the unique context. However, I would argue that this study is generalizable to other protracted crises and/or refugee settlements which focus on mental health as an outcome, in LMICs, but not generalizable to the context of higher-income countries which have different cost-effectiveness thresholds. Generalizability is

also limited by the fact that the SRQ-20 is not a utility measure such as QALY, which is a measure that has a universally established cost-effectiveness threshold based on Gross Domestic Product (GDP) and therefore can compare costs across different health outcomes. Despite this limitation, this study is a CEA not a Cost-Utility Analysis, and therefore the purpose of this study has been achieved.

Overall, this economic evaluation is one of the first to be done, and the base-case provides the most accurate estimations and reveals important insights on the cost-effectiveness of MHPSS delivered in refugee contexts, providing a layout for further research investigating what public health interventions for improving mental health among refugees are both effective and cost-effective.

Is it cost-effective?

Interpreting cost-effectiveness based on the resulting ICERs is difficult in this context because in LMICs there exists little guidance on establishing cost-effectiveness thresholds (33). Furthermore, determining cost-effectiveness would be challenging because we do not use utility measures such as QALYs which follow established Gross Domestic Product (GDP) cost-effectiveness thresholds, from the Commission on Macroeconomics and Health. Simply put, there is no known value of a point decrease on the SRQ-20, with no literature to approximate SRQ-20 with a utility measure. For example, one economic evaluation used Markov modeling to assess the value of funding group psychotherapy for patients with depression in Uganda (34). The ICER came to be 1150 USD per QALY gained and considered cost-effective based on Uganda's Gross-Domestic Product (GDP) (34). However, we cannot approximate this study to that economic evaluation, which is using QALY and not a specific health outcome such as mental health. Despite this limitation of valuing the SRQ-20, we do know that the SRQ-20 assessment is a reliable and valid instrument commonly used in LMICs, can illustrate improvements in mental health and for the purpose of a CEA, is a measurable health outcome (35).

I will turn to the WHO Choosing Interventions that are Cost-Effective (WHO-CHOICE) program to argue that this intervention is cost-effective (36). The WHO-CHOICE is a program mainly for CEAs and recommends having what's called a Generalized Cost-Effectiveness Analysis (GCEA). The WHO-CHOICE GCEA perspective recommends not using a threshold to

argue cost-effectiveness and rather think in terms of trade-offs i.e. opportunity cost of investing resources into something else and, decide cost-effectiveness based on contextual factors and supporting studies (36). Therefore, I will turn to the potential cost(s) of not funding mental health in this context to argue that there is a significant economic loss from not investing in this intervention (the trade-off). Furthermore, I will look at Uganda's country preferences by analyzing their health sector budgeting landscape to argue the need to increase the capacity of mental health budgeting in Uganda.

Mental health disorders do result in labor productivity losses and economic downfalls (37). One study used Generalized Method of Moments regression to evaluate the interaction effects of mental health disorders and labor productivity on economic growth in Africa, including Uganda (37). The study found that as the prevalence of mental health disorders increased, economic growth and labor productivity decreased, at a statistically significant rate (37). We can turn to the International Labor Organization (ILO), to estimate the possible productivity loss in Uganda due to mental health disorders. According to the ILO, the average hourly earnings of employees without a disability in Uganda is 2.70 USD, and for employees with a disability it is 1.60 USD, a difference in 1.30 USD (38). The mean weekly hours worked per employee in Uganda without a disability is 50.4 hours and with a disability is 45 hours, leading to a loss of 5.4 hours per week (38). Combined with the average hourly wage, the weekly earnings for an employee without a disability in Uganda is 136 USD and with a disability is 72 USD, amounting to a loss of 64 USD weekly or, 3,332 USD a year. This amount is greater than the ICER of 331 USD, and therefore I would argue that the intervention is cost-effective in comparison to the potential earnings lost. A mental health disorder does disturb daily functioning and therefore, can be considered a disability (39). According to the National Policy on Disability in Uganda, disabilities can be displayed as mental impairments, however there is an obvious limitation with approximating earnings lost due to disability being the same as the earnings lost due to mental health disorders (40). However, there is a study that found that the mean average earnings lost is \$4,798 a year for adults living with anxiety and depression in South Africa (41). This is even higher than the projected loss in earnings from disability in Uganda (\$3,332 a year), supporting that there would be a large productivity loss due to mental health disorders. Furthermore, in the South African study, when the cost from lost earnings is extrapolated from the sample, the total

annual cost is \$3.6 billion (41). It's clear that mental health disorders would cause an economic loss for Uganda, and therefore this intervention is cost-effective.

On the other hand, based on the Annual Health Sector Performance Report by Uganda's Ministry of Health (MOH), for the year 2023/2024 the health sector budget allocated is 7.7% of the national budget, amounting to 4,052 billion UGX (42). In 2023, Uganda's population was 48,656,601 (43). This would amount to about 68 USD per capita being allocated for Uganda's national health budget. Previous research estimates that Uganda spends only one percent of their national health care budget on mental health (44). However, this could be less because there was no discussion on budget allocation for mental health in the MOH 2023/24 report, even though it stated that the prevalence of outpatient visits for mental health disorders increased by 16% (42). This is not an uncommon phenomenon as most LMICs allocate less than one percent of their budget to mental health, despite the detriments mental health has on quality of life, and the economy (45). Using the estimated budget for mental health, one percent of the 68 USD per capita spent on health is 0.68 USD per capita for Uganda's estimated mental health budget. This reveals information about Uganda's actual health spending preferences, with Uganda's supposed budget per capita for mental health (0.68 USD) being less than the ICER of 22 USD per participant, and therefore this intervention is not cost-effective for Uganda. However, the Abuja Declaration, an agreement by African Union countries, states that, African Union countries should allocate at least 15% of their annual budget to the health sector (46). While Uganda has made great strides in increasing their health sector budget over the years, based on this declaration, they could increase their health budget which is currently 7.7% of the national budget, and make more allocations towards mental health interventions, such as this one.

Based on productivity, the intervention is cost-effective because the benefit of treating mental health disorders would increase productivity by an estimated 3,332 USD a year in Uganda. On the other hand, based on the very small amount Uganda spends on mental health (0.69 USD per capita), this intervention is not within their national budget. However, with the recommendation from the Abuja declaration, I would argue that there is space for an increase in Uganda's budget for mental health, and what Uganda is spending currently is not enough which is also demonstrated by the increased prevalence in mental health disorders mentioned in their Annual Health Sector Performance Report (42). Therefore, overall, I would argue this

intervention is cost-effective based on the productivity trade-off and argue Uganda increases its budgeting for mental health.

Implications, next steps and recommendations

In 2006 Uganda passed the Refugee Act, which granted refugees more freedoms and protections, but there still lacks an advocacy for their mental health in practice (47). Most refugees are trauma survivors, coming from war-affected countries, so caring for their mental health is imperative. In the future, MHPSS research should continue to bridge the current research gaps on its long-term sustainability, the effects it could have when integrated with other services in humanitarian settings, and questions on its cost-effectiveness (48). Research recommends integrating economic empowerment with MHPSS among persons in conflict-afflicted settings (12, 49). Under partnership with DIGNITY and TPO Uganda, another economic evaluation is planned to be conducted on the cost-effectiveness of integrating MHPSS with economic empowerment in Kyaka II, for the participants who were in the DIGNITY project and went on to receive economic empowerment after graduation from MHPSS. Economic insecurity we know is a risk factor for poor mental health among this specific population living in Kyaka II, therefore this future economic evaluation plans to compare if adding economic empowerment to MHPSS is cost-effective in comparison to delivering MHPSS alone. Furthermore, the utility measure QALY will be measured along with other outcomes, among the participants who received MHPSS only and the participants who received MHPSS with economic empowerment.

Based on the results of this study, I would make a few recommendations. First, I would recommend that MHPSS continue to be offered as a service to refugees and Ugandans living in and around Kyaka II. Due to the lack of generalizability in this study, I would suggest that QALY be measured at baseline and follow-up for the future MHPSS programs because, using a utility measure in an economic evaluation would allow for decision-makers to compare costs across a variety of health outcomes (29). Furthermore, outcomes should be measured over a year after the intervention, to make better estimations about mental health relapse in the future and argue long-term sustainability of MHPSS. Finally, based on my arguments for cost-effectiveness and the large economic loss from mental health disorders in Africa, there should be a discussion about the budget for mental health in Uganda however, ethically this could bring up issues as there is many pressing health problems present in Uganda.

Conclusion

To conclude, the cost of the intervention is 281 USD per participant, and it was found to be effective with 88% of the 2401 participants recovering, and a decrease in 12.7 points on the SRQ-20 between pre and post intervention. The intervention is cost-effective at an ICER of 22 USD per participant based on the estimated productivity loss of 3,332 USD a year, even though the cost of the intervention is not within Uganda's supposed budget for mental health (0.68 USD per capita). On the one hand, one could argue that concluding that this intervention is cost-effective raises ethical concerns regarding how Uganda should prioritize health problems, however, mental health is still a large public health issue that should not be overlooked. In the end, the future is still undetermined, humanitarian crises break out frequently and economic instability is prevalent. Further research on what public health-oriented methods is cost-effective in supporting the mental health of individuals surviving these crises is warranted.

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Tables

Table 1: Descriptive Characteristics

Descriptive characteristics	Graduated MHPSS (N=2401)	Lost to drop out or follow-up (N=96)	Statistical significance (p-value)
Age	39.9(13.6)	41.01(14.6)	0.415
Sex			0.531
Female	1913(79.7)	79(82.3)	
Male	488(20.3)	17(17.7)	
Refugee status			<0.001
Refugee	2290(95.4)	76(79.2)	
Ugandan	111(4.6)	20(20.8)	
MHPSS type			<0.001
CBT	2127(88.6)	62(64.6)	
PM+	274(11.4)	34(35.4)	
Project funder			<0.001
DIGNITY	835(34.8)	96(100)	
UNHCR	1566(65.2)	0	
SRQ-20 scores			0.677
Pre SRQ-20	15.48(3.6)	15.32(3.9)	
Post SRQ-20	2.8(3.2)	n/a	

Note: Table 1 summarizes the age, sex, refugee status, MHPSS type and project funder for the 2401 participants graduated from HPSS and the 96 lost to dropout. The frequency is reported, followed by the percentage in parentheses for all variables except for age and SRQ-20 scores. For age the mean is reported with standard deviation in parentheses and the mean pre SRQ-20 score and mean post SRQ-20 score is reported with standard deviation in parentheses. There is n/a for post SRQ-20 score for the dropout column because no post scores could have been collected. In the final column the p-values are reported, representing if there is a statistically significant difference between graduated and dropouts based on the corresponding row variable through a paired samples t-test for continuous variables and chi-squared test for categorical variables.

Table 2: Cost analysis

Cost category	Total cost	Cost per participant (N=2497)
Screening and recruitment	192,838,544 UGX 163,648.55 USD	77,228.09 UGX 65.54 USD
MHPSS	102,209,706 UGX 86,738.21 USD	40,933.00 UGX 34.74 USD
Operational	534,570,116 UGX 453,652.18 USD	214,084.95 UGX 181.68 USD
Total cost of intervention	829,618,366 UGX 704,039.94 USD	332,246.04 UGX 281.95 USD

Note: Table 2 shows the total cost and cost per participant for each cost category for the sample size, N=2497. Through summation the total cost of the intervention and the total cost per participant is reported. Costs are reported in UGX and exchanged to USD using PPP 1,178.37.

Table 3: Effect analysis

Measure of effect	Value
Mean raw score change in SRQ-20	12.7(4.96)
Number of recovered participants	2121(88.3%)
Hedges G effect size	2.5(2.469-2.634)

Note: Table 3 represents three ways to measure the effect of MHPSS – mean raw score change in SRQ-20 with standard deviation in parentheses, number of recovered participants with percentage reported in parentheses and Hedges G effect size with the 95% confidence interval reported in parentheses.

Table 4: Association between change in SRQ-20 scores (mental health) and sex, refugee status, age, MHPSS type and project funder through a multivariable regression

	Regression coefficient	P-value
Female	.944(.26)	<0.001
Ugandan	.006(.49)	.990
Age	.005(.008)	.521
PM+	.595(.37)	.103
UNHCR	.020(.25)	.938

Note: Table 4 illustrates the results from a simple linear regression with change in SRQ-20 from post to pre assessment as the dependent variable. The regression coefficients represent the mean difference between sex, refugee status, age, MHPSS type and funder. In the parentheses standard error is reported, followed by p-value.

Table 5: Cost-effectiveness analysis

	Cost	Measure of effect	Effect	ICER
ICER 1	332,246.04 UGX 281.95 USD	Mean raw score change in SRQ-20	12.7(4.96)	26,161.12 UGX 22.20 USD
ICER 2	829,618,366 UGX 704,038.94 USD	Number of recovered participants	2121(88.3%)	391,144.92 UGX 331.94 USD

Note: Table 5 shows ICER 1 and ICER 2. For ICER 1 the cost per participant is presented, the effect based on the mean raw score change in SRQ-20 with standard deviation reported in parentheses, and the resulting ICER in USD and UGX. For ICER 2 the total cost of the

intervention is presented, the effect based on the number of recovered participants with percentage reported in parentheses, and the resulting ICER in UGX and USD.

Table 6: Sub-group ICER analysis

	Frequency (N=2401)	Mean	Cost	ICER
Female	1913(79.7)	12.9(4.938)	332,246.04 UGX 281.95 USD	25,755.51 UGX 21.86 USD
Male	488(20.3)	11.9(4.986)	332,246.04 UGX 281.95 USD	27,919.84 UGX 23.69 USD

Note: Table 6 reports the results from a sub-group ICER analysis stratified by sex. The frequency of females and males is reported with percentage in parentheses, the mean raw score change in SRQ-20 from the t-test with standard deviations in parentheses, p-values, corresponding costs, and the resulting ICER based on the means.

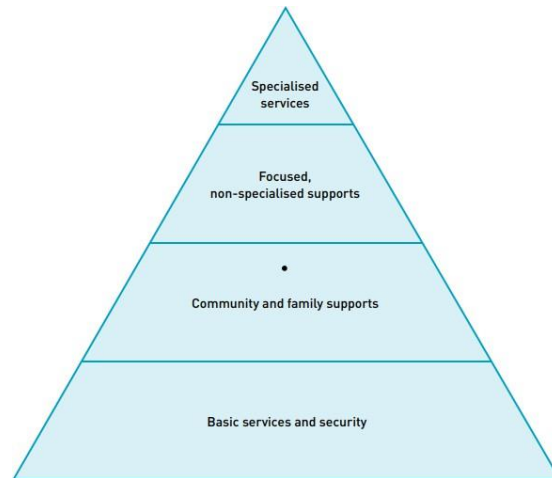
Table 7: Sensitivity analysis

			Sensitivity analysis		
			Lower limit	Base case scenario	Upper limit
Scenario 1	Personnel cost +/- 50%	ICER (recovered participants)	267,929.42 UGX 227.37 USD	391,144.92 UGX 331.94 USD	514,360.41 UGX 436.50 USD
		ICER (mean raw score change)	17,920.03 UGX 15.09 USD	26,161.12 UGX 22.20 USD	34,777.12 UGX 29.51 USD
Scenario 2	Comparator group of 17% recovered	ICER		391,144.92 UGX 331.94 USD	484,307.27 UGX 411.00 USD
Scenario 3	Drop-out before MHPSS	ICER		26,161.12 UGX 22.20 USD	26,963.98 UGX 22.88 USD

Note: Table 6 shows three one-way sensitivity analyses, and the resulting ICERs in comparison to the base ICER reported in UGX and USD.

Figures

Figure 1: Intervention pyramid for mental health and psychosocial support in emergencies.



Note: Figure 1 shows the MHPSS pyramid established by the Inter-Agency Standing Committee (IASC). It is how mental health, and psychosocial support should be delivered in humanitarian emergencies in a step-wise manner, including in refugee contexts.

Appendices

Appendix A: SRQ-20 (MHE assessment)

Section 5: Symptoms		
Next, I will ask you some questions about how you have been feeling. There are no right or wrong answers. Please be honest in your response, and also tell me if there are any questions that are not clear.		
SRQ- 20	NO	YES
1. Do you often have headaches?	0	1
2. Is your appetite poor?	0	1
3. Do you sleep badly	0	1
4. Are you easily frightened	0	1
5. Do your hands shake?	0	1
6. Do you feel nervous tense or worried?	0	1
7. Is your digestion poor?	0	1
8. Do you have trouble thinking clearly?	0	1
9. Do you feel unhappy?	0	1
10. Do you cry more than usual?	0	1
11. Do you find it difficult to enjoy your daily activities?	0	1
12. Do you find it difficult to make decisions?	0	1
13. Is your daily work suffering?	0	1
14. Are you able to play a useful part in life?	0	1
15. Have you lost interest in things?	0	1
16. Do you feel you are a worthless person?	0	1
17. Has the thought of ending your life been on your mind?	0	1
18. Do you feel tired all the time?	0	1
19. Do you have uncomfortable feelings in your stomach?	0	1
20. Are you easily tired?	0	1

Appendix B: Profile of beneficiaries

Kyaka 2 refugee settlement

#	Requirement	MHPSS intervention
What?	List all different activities under each intervention	CBT and PM+ 2022-2024 Attended 80% of the sessions
	What resources were used in delivering each intervention? E.g. personnel, charts,	Personnel (social workers and VPAs) Refreshments Stationery

	demonstration sites, training facilities, etc.	Motorbikes and fuel Tablets Airtime CBT+ and PM+ session manuals
WHY	What is the rationale for the interventions	CBT Enhance coping mechanisms Improve psychological wellbeing Promote self-awareness Cognitive restructuring: increasing positive thoughts and decreasing negative thoughts PM+ Stress management Problem management Behavior activation to improve low mood and inactivity
WHO	Which individuals are targeted for the interventions – what vulnerabilities and needs do they have to qualify for the intervention	CBT Individuals with moderately severe symptoms of trauma, depression and anxiety PM+ Individuals with mild to moderate symptoms of psychological distress
	What characteristics of the participants such as age, co-morbidities, risk factors etc. keeping confidentiality in mind	Individuals above 18 years of age Experienced or witnessed traumatic events Individuals with anxiety and depression Individuals at risk of suicide Individuals with deteriorated levels of functioning and wellbeing
	Which partners were involved in providing the services	TPO Uganda
	Which personnel are involved in the screening/recruitment process and in conducting the interventions. Any other contributors (funders and providers) to the interventions	Social workers, a clinical psychologist, M&Es, VPAs, PCOs, UNHCR

WHEN	When were the interventions/activities delivered	2022-2024
WHERE	Where was each part of the intervention was delivered for example, at the settlement, at a different location, at a rented venue, etc. and if transportation was involved	In-kind venues in the settlement like churches, community halls, tree shades, households No transport refund needed for participants
HOW	How are beneficiaries identified and assessed?	Self-referrals after awareness sessions Referrals from partners or community structures Screening to determine the severity of the conditions of the beneficiaries
	How long was each intervention? The frequency of which beneficiaries of the interventions were seen (how often are the MHPSS sessions? How often do follow-ups?)	CBT – 10 sessions for 60-90 minutes each over 10 weeks PM+ - 5 sessions for 60-90 minutes each over five weeks 3-month follow-up monitoring graduated groups
	How many participants in each intervention, number of staff employed in screening/recruitment and conducting each intervention (including volunteers), number of sessions (till graduation), number of follow-ups, etc.	CBT 12-15 individuals per group 1 social worker and 1 VPA PM+ 8-12 individuals per group 1 social worker and 1 VPA running 8 groups of 8 participants in a quarter

Appendix C: Breakdown of cost categories and detailed costs

Cost category	Activities	Cost (UGX)	Cost per participant (DIGNITY, N=931) (UGX)	Cost per participant (UNHCR, N=1566) (UGX)
Screening and recruitment	Developing culturally sensitive MHPSS Messages • Flyers • Posters • Banners • Stickers	7,754,000	8,328.68	4,951.47

	Training facilitators on how to deliver community awareness activities • Venue for four days • Stationery (notebooks, flip charts, pens, markers) • Meals and refreshments • Transport allowance	8,580,000	9,215.90	5,478.93
	Engagement with community leaders • Meals and refreshments • Transport refund • Venue for one day	2,910,000	3,125.67	1,858.24
	Community awareness activities • Radio talk shows • Pre-recorded messages • T-shirts	27,734,090	29,789.57	17,710.15
	Training in referral mapping • Stationery and printing costs	1,500,000	1,611.17	957.85
	Update referral map for hotspots • Stationery and printing costs	999,000	1,073.04	637.93
	Conduct community interactive psycho-education sessions	960,000	1,031.15	613.03
	Conduct MHE screenings • Tablets • Vehicle mileage • Vehicle fuel	142,401,454	152,955.38	90,933.24
	Sub-total (UGX)	192,838,544	207,130.55	123,140.83
	Sub-total (USD)	163,648.55	175.78	104.50

MHPSS (direct)	Training MHPSS providers - Hired venue for five days - Meals and refreshments - Transport allowance	6,810,000	7,314.72	4,348.66
	Workshop with MHPSS providers on trauma-informed care and cultural sensitivity - Venue for 1 day - Meals and refreshments - Transport refund	2,200,000	2,363.05	1,404.85
	Providing MHPSS - Laptop for clinical psychologist - Vehicle mileage and maintenance costs - Refreshments/meals - Stationery - MHPSS venue (0 UGX)	93,199,706	100,107.10	59,514.50
	Sub-total (UGX)	102,209,706	109,784.86	65,268.01
	Sub-total (USD)	86,738.21	93.17	55.34
Operational (indirect)	Personnel costs - Monitoring & Evaluation officer - Clinical psychologist (1) - Social workers (3) - VPA allowances (6) - Field driver - Program focal person	522,680,116	561,417.96	333,767.64
	Operational Communication and internet	11,890,000	12,771.21	7,592.59
	Sub-total (UGX)	534,570,116	574,189.17	341,360.23
	Sub-total (USD)	453,652.18	487.27	289.69

Popular science summary

Mental health disorders such as anxiety, depression and Post-Traumatic Stress Disorder (PTSD), effects one in eight people worldwide. Certain groups are especially vulnerable to mental health disorders like people escaping war-afflicted countries, such as refugees. The Democratic Republic of the Congo (DRC) has been in an ongoing civil war for the past thirty years leading many persons to flee to the neighboring country, Uganda. One place they have fled to is Kyaka II, an established refugee camp in Uganda, but here they still experience mental health challenges further exacerbated by limited economic opportunities.

Due to the mental health challenges people experience in Kyaka II, Mental Health and Psychosocial Support (MHPSS) is introduced as a source of treatment. In the years from 2022-2024 the refugees from the DRC living in Kyaka II were made aware of and recruited for MHPSS treatment. This study aimed to evaluate if the treatment they received was cost-effective, meaning the costs paid for the MHPSS to be delivered are reasonable based on the level of improvement participants experienced in their mental health from the treatment.

The participants experienced a very large improvement in mental health, with 88% of the 2497 participants successfully being treated for a total cost of the MHPSS at 704,038 USD. Although based on Uganda's health budget preferences, there is little room for spending on this mental health intervention, but the economic consequences from loss in productivity (3,332 USD a year) from mental health disorders in Uganda is larger than the cost of the intervention, and therefore this intervention is cost-effective. In the future, it is recommended that MHPSS continues for both refugees and Ugandans in Uganda and more research on the long-term sustainability of MHPSS is conducted.