

## Original Research

# Clinic outcomes of the Pathway Through Care Model: A cross-sectional survey of adolescent depression in Malawi

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## Abstract

### Background

Depression is one of the leading contributors to the global burden of disease and often has an onset during adolescence. While effective treatments are available, many low-income countries, such as Malawi, lack appropriately trained health providers in community health settings, and this limits access to effective mental healthcare for young people with depression. To address this need, a Canadian-developed youth depression Pathway Through Care Model, linking school-based mental health literacy interventions to training of community healthcare providers, was adapted for use in Malawi and successfully applied.

### Methods

A sample of healthcare providers (N = 25) from community health clinics (N = 9) were trained in the use of comprehensive, systematic clinical interventions, addressing the identification, diagnosis, and treatment of depression in youth who had been referred from schools where mental health literacy interventions had been implemented. Referral outcomes were obtained using a standardised clinical record form.

### Results

Over 120 clinical outcome forms were available for analysis. Seventy percent of youth referred by their teachers were diagnosed with depression. Most youth diagnosed with depression identified physical symptoms as their primary difficulty. Available standardised outcome measures applied by clinicians indicated that, overall, youth showed positive outcomes as a result of treatment.

### Conclusions

Community healthcare providers in Malawi were trained in the identification, diagnosis, and treatment of youth depression. When this training was applied in usual clinical care to youth referred from schools, it led to generally favourable clinical outcomes. To our knowledge, this is the first demonstration of a clinically feasible intervention that results in positive outcomes for young people with depression in Malawi, and it may provide a useful model to replicate elsewhere in sub-Saharan Africa.

## Introduction

Neuropsychiatric conditions (including depression) account for almost 15% of the global burden of disease, with over 70% of the burden being in low- and middle-income countries (LMICs).<sup>1,2</sup> Furthermore, neuropsychiatric conditions are among the leading causes of disability, accounting for almost 40% of years of life lost due to a disability among those aged 15 years and older worldwide.<sup>2</sup> Depression is the leading cause of illness and disability globally in youth populations, with suicide (often associated with untreated depression) being the third most common cause of death.<sup>3,4</sup> In Malawi, depression is the fourth leading cause of disability, after HIV/AIDS, cataracts, and malaria.<sup>5,6,7</sup> Depression, if left untreated, can negatively impact quality of life and future vocational achievement, lead to increased morbidity, contribute to early mortality, and is recognised as a potential risk factor for other illnesses.<sup>8,9</sup> The onset of depression often occurs during adolescence,<sup>10,11</sup> with most cases of mental disorders being diagnosed by the age of 25.<sup>12-15</sup> In low-income countries, where young people make up the largest proportion of the population, this can have major public health implications. As about 70% of the 18 million people in Malawi are below 25 years of age,<sup>16</sup> there is a need to effectively address this health challenge.

Although research about adolescent mental health is scanty in Malawi, available studies indicate that depression is a

common disorder encountered in community health clinics. Stewart<sup>17</sup> found a prevalence of nearly 30% among women attending an antenatal clinic, Kaue<sup>18</sup> found a prevalence of almost 30% among those attending primary healthcare clinics, and Udedi<sup>6</sup> found a prevalence rate of roughly 30% among attendees visiting the Matawade Health Centre in Zomba. However, existing mental health specialty services are under-developed and under-resourced,<sup>19,20</sup> and community health clinic staff have not been trained in the identification, diagnosis, and treatment of depression in young people. As a result, the necessary mental healthcare for adolescents is not available.

Malawi's public health system follows a 3-tiered system of medical facilities: (1) health posts, health centres, and community and rural hospitals (primary); (2) district hospitals (secondary); and (3) urban central hospitals and other specialised hospitals (tertiary). However, the national health budget prioritises allocating resources to the top tier of health services; other tiers are often without supplies—particularly primary-care facilities.<sup>21,22</sup> Furthermore, there are inadequate numbers of registered doctors and nurses to service all 3 tiers of the health system. For this reason, rural health services have fewer resources than urban health services even though many people will only ever receive care from rural hospitals and other rural primary-care facilities.<sup>21</sup> Despite depression having a high prevalence and being a

leading cause of disability in Malawi, there is a dearth of healthcare professionals adequately trained to treat mental disorders. According to the most up-to-date Ministry of Health report there are only 2 full-time psychiatrists and 39 psychiatric nurses working in mental hospitals in Malawi<sup>23</sup>; this translates to just 0.01 psychiatrists and 0.22 psychiatric nurses per 100,000 people.<sup>20</sup> Consequently, mental disorders often go undetected and misdiagnosed. For example, Udedi<sup>6</sup> found low detection rates for mental disorders among primary healthcare clinicians, which were in many cases misdiagnosed as physical disorders. In Malawi, as in many countries in sub-Saharan Africa, depression is frequently misdiagnosed and treated as malaria, according to many studies.<sup>6,7,20</sup> These diagnostic and treatment challenges have the potential to tie up the limited mental health services available, as patients struggle with complications from incorrect diagnoses and treatments, thereby requiring more visits to receive proper treatment, ultimately leaving many people without proper mental healthcare. The paucity of resources and training of healthcare providers (HCPs) in Malawi demands not only a scale-up of mental health services in the country, but also highlights the need for HCPs to have the necessary competencies needed for the provision of mental healthcare at the community level.

To address this need in Malawi, a Grand Challenges Canada-funded intervention (“An Integrated Approach to Addressing the Challenge of Depression (IACD) among the Youth in Malawi and Tanzania”) was applied by Canadian and Malawian collaborators. This approach utilised a “Pathway Through Care Model” that simultaneously addresses mental health awareness through youth radio programmes, mental health literacy (through teacher curriculum resource training and school-based radio listening clubs), and enhancement of clinical competencies in community HCPs, through an education and training programme developed in Canada by one of the investigators (SK) and certified by the Canadian College of Family Physicians. The clinical training programme has previously been successfully adapted in other low-income countries, where it has demonstrated positive outcomes in health provider knowledge, confidence, attitudes, and personal help-seeking behaviours.<sup>24–26</sup> For Malawi, this programme was adapted and translated into Chichewa by a group of mental health professionals that included psychiatrists, psychologists, nurses, counsellors, and health educators, under the authority of the mental health lead from the Ministry of Health, Malawi, who also a co-investigator (MU).

Previous reports have described the school mental health literacy approach and the impacts of this intervention in Canada and elsewhere.<sup>27–32</sup> As part of this process, teachers were trained in the use of a mental health literacy curriculum resource (“The African Guide”) and applied it in their classrooms. In addition, teachers received training in how to identify youth who may be showing signs and symptoms of depression and how to refer them to their local community health clinics. Concurrently, community health clinic staff received training in the youth depression identification, diagnosis, and treatment programme identified above. This article reports on the outcomes achieved as determined by HCPs who systematically identified, diagnosed, and treated depression in a sample of youth who were referred by teachers to a community health clinic for a possible mental disorder.

## Methods

### Design

This was a cross-sectional survey that investigated the clinical application of a standardised tool-based youth depression screening, diagnosis, and treatment intervention, applied over the course of 6 months. The surveys measured the outcomes of adolescents referred, diagnosed, and treated for depression by trained HCPs in various community health clinics in Malawi.

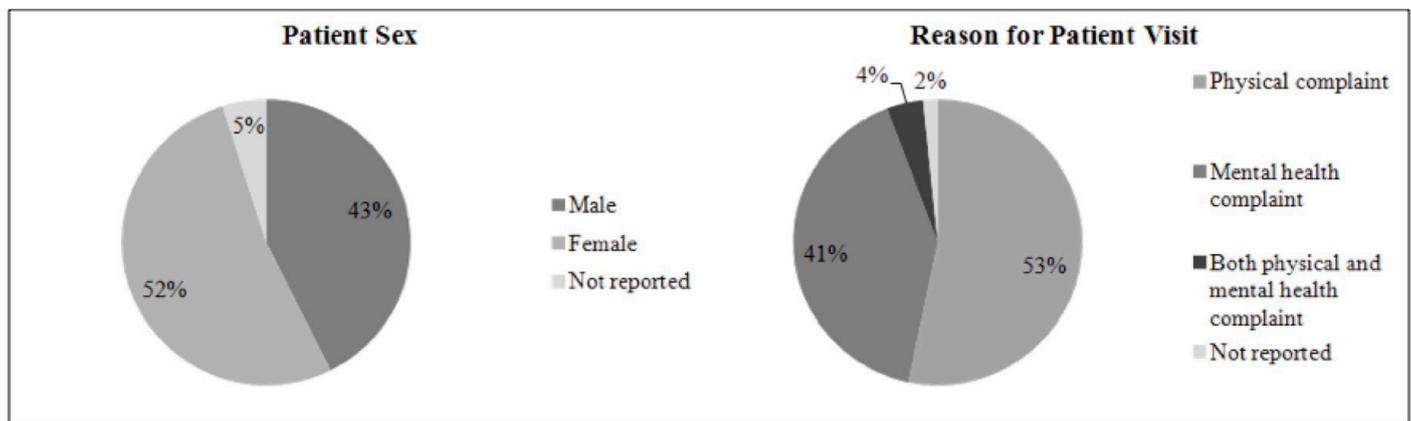
### Participants

Participants were community-based HCPs located in various community health clinics in the Central Region of Malawi. As part of the IACD project, and with the support of the Malawi Ministry of Health, each district identified a group of representative HCPs from community clinics who were then trained by a national youth depression training team (the group who had participated in the adaptation of the Canadian resource) on a comprehensive adolescent depression screening, diagnosis, and treatment programme. After the training, participants returned to regular practice in their community clinics. Concurrently, a number of school teachers in these communities received the mental health literacy training described above. Standardised clinical data were collected from adolescent community health clinic attendees who were referred from their schools at the study sites.

### Procedure

A Canadian-developed youth depression training programme was adapted and modified for use in Malawi by mental health experts and educators as described above. Educators and HCPs were trained using workshops, followed by a period of clinical application, all totaling a duration of approximately 8 months. The clinical application of the training conducted with educators and HCPs, reported herein, was observed over the course of 6 months. Participants were trained on the use of a psychotherapy and counselling-based clinical intervention (effective helping, EH), initially developed for use by HCPs by one of the study investigators (SK), and adapted by the same expert team for application in Malawi. Standardised patient data collection forms (Youth Depression Assessment and Outcomes Measure Tool, in the Supplementary Appendix, available at [www.mmj.mw](http://www.mmj.mw)) were created and provided to clinicians who had received the training programme. Fluoxetine, an antidepressant medication with demonstrated positive effect in adolescents,<sup>33–35</sup> was made available by the government of Malawi for use in this study, and HCPs were trained on its effective application. HCPs were also trained on the use of the 6-item Kutcher Adolescent Depression Scale (KADS-6), Teen Functional Assessment (TeFA), Tool for Assessment of Suicide Risk Adolescent Version Modified (TASR-A), and the Chehil-Kutcher Side Effects Scale (CKS) for SSRIs (a number of the assessment tools used in this study can be found at <http://teenmentalhealth.org/toolbox/>). The Clinical Global Impression (CGI) scale<sup>36</sup> was chosen as the primary clinical outcomes evaluation measure, and HCPs were taught to use it to evaluate patient outcomes.

HCPs used their previous training in the identification of depression in adolescent populations in conjunction with the aforementioned assessment tools to determine if depression should be diagnosed. As indicated on the questionnaires, clinicians were asked to conduct screening of all youth who



**Figure 1: Patient demographics**

attended clinics for any health concern. The questions used for screening were: (1) *Over the past few weeks, have you been having difficulties with your feelings, such as feeling sad, down, or “blah” most of the time?* (2) *What about feeling irritable most of the time, even when you know you should not be?* (3) *Can you tell me more about how you are feeling inside?* If depression was suspected, HCPs were instructed to complete the KADS-6 and a diagnostic interview that included a mental status examination to determine the presence or absence of depression (using DSM-5 criteria). If depression was diagnosed, clinicians applied treatments as per their training experience using EH, fluoxetine, or both, depending on their clinical judgment. For youth diagnosed and treated for depression, clinicians were also requested to complete the patients’ CGI scores at each treatment visit to track and score their clinical outcomes over time.

**Statistics**

Descriptive statistics were used to report the responses from the Youth Depression Assessment and Outcomes Measure tool. The data was entered and analysed using SPSS statistics software for Windows, version 22.0.

**Results**

**Sample characteristics**

A total of 122 questionnaires, completed by 25 different HCPs were received from 9 different community clinic locations: Annie Chinuluwe (n = 1; 0.82%), Anthony Herbal (n = 1; 0.82%), Area 18 Health Centre (n =13; 10.66%), Bwaila Hospital (n = 83; 68.03%), Kawale Health Centre (n = 12; 9.84%), Maganga Health Centre (n = 2; 1.64%), Mchinji District Hospital (n =3 ; 2.46%), Salima District Hospital (n = 5; 3.28%), and Senga Bay Baptist Medical Clinic (n = 2; 1.64%).

The mean age of patients seen was 19.28 years (standard deviation, SD = 3.67), with the majority being female (64 females, 52.5%; 52 males, 42.6%; 6 no information recorded, 4.9%). Sixty-five patients (53.3%) primarily reported a physical complaint (Figure 1).

**Clinical use of screening and diagnostic assessment tools**

Screening questions were recorded for 121 (99.2%) of the 122 patients. Of this group, 107 (88.4%) screened potentially positive for depression. Most HCPs then applied further diagnostic and assessment tools including: the Kutcher Adolescent Depression Scale (KADS; 97.5%), the Tool for Assessment of Suicide Risk: Adolescent Version Modified (TASR-Am; 91.7%) and the Teen Functional Assessment (TeFA; 78.5%).

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**Diagnostic reporting and treatment**

Following application of diagnostic assessment tools plus history and mental status examination, a total of 92 patients (75.4%) received a mental health-related diagnosis—85 youth (71.4%) were primarily diagnosed with depression, and 26 youth (28.9%) were diagnosed with another mental disorder. Among other mental disorders, 6 patients were diagnosed with a substance use disorder, 3 with epilepsy, and 6 with various undisclosed mental disorders. Ten HCPs did not provide this information. Nineteen cases were diagnosed with depression plus another mental disorder. Figure 2 shows a flow chart of results reported by clinic HCPs.

Of those diagnosed with depression, 79 (92.9%) were recorded as having received treatment: 47 were treated with antidepressant medication, 78 were treated with EH, and 22 were given another type of treatment. Of the patients who received a diagnosis other than depression, 92.3% were recorded as receiving treatment: 11 were treated with an antidepressant medication, 22 were treated with EH, and 15 were treated with another treatment. Other treatments included (but were not limited to) chlorpromazine, fluconazole, haloperidol, magnesium, and various analgesics.

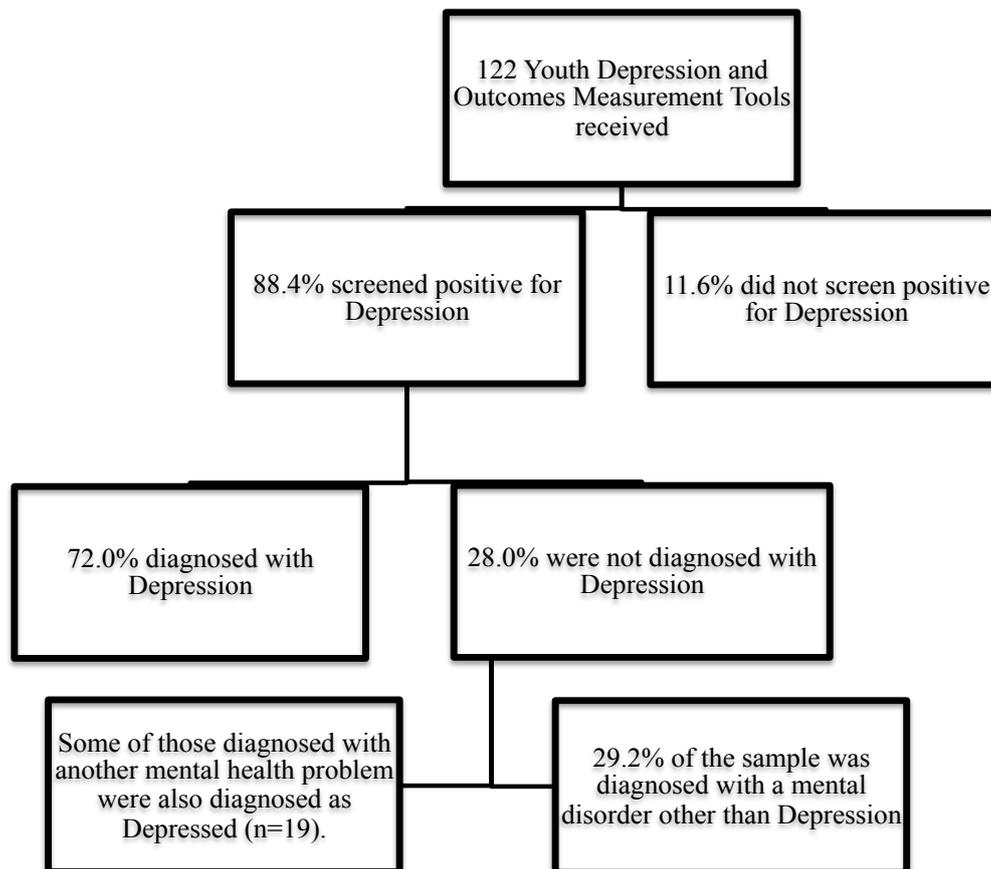
**Clinic outcomes reporting**

Complete patient outcome information (application of the CGI at clinic visits for at least 8 weeks of treatment duration), was only provided by 7 HCPs. After 8 to 12 weeks of treatment, 1 HCP indicated clinical outcomes as “somewhat better”, 3 HCPs indicated clinical outcomes as “better”, and 3 HCPs indicated clinical outcomes as “much better”.

The same 7 clinicians also completed a measure of functioning (the Teen Functional Assessment Score: TeFA). After 8 to 12 weeks of treatment, 1 clinician indicated patient functioning as “somewhat better”, 3 clinicians indicated patient functioning as “better”, and 3 clinicians indicated patient functioning as “much better”.

**Discussion**

To our knowledge, this is the first study in Malawi to report on the screening, diagnosis, treatment, and clinical outcomes of young people referred by educators to trained community health providers for clinical assessment of possible depression. The results described herein demonstrate that a Pathway Through Care approach that links schools to health care providers can be successfully applied in a low-income sub-Saharan African setting and generate positive results in a number of health system-relevant domains.



**Figure 2: Flow chart of results reported by clinic healthcare providers**

First, this study suggests that educators who are trained in a mental health literacy intervention can successfully identify depression in young people, resulting in a significant proportion of youth (in this case, 70%) referred for care who met the diagnostic criteria for depression. This suggests that educators effectively learned how to identify and refer young people at high risk for having depression. However, this consideration cannot be definitively concluded from this study, as we did not apply an independent analysis of all students who may have potentially been considered for referral, thus we cannot determine neither the sensitivity nor specificity of this type of case identification approach. Nonetheless, the high proportion of youth referred who were subsequently diagnosed with depression suggests that this type of intervention has merit. This case identification also requires a comparison with the number of students who had been identified and referred by these teachers prior to the intervention—there were none—as such a system did not exist previously and teachers were neither aware of depression in young people nor did they refer any student for mental health assessment. Thus, the intervention’s impact in terms of identification and referral of young people with depression suggests that a school-based mental health literacy approach that combines awareness with teacher training<sup>29,30</sup> may have merit in Malawi with respect to enhancing access to mental healthcare for young people with depression.

Although students were referred by their teachers for mental health concerns, these data highlight that young people may frequently identify a physical symptom as their primary complaint. If HCPs were not systematically applying screening questions followed by a diagnostic assessment, some of these youth may have had a mental disorder

undetected, undiagnosed, and untreated. Alternatively, they may have been misdiagnosed as having a physical health problem and inappropriately treated, which has been previously reported by Udedi.<sup>6</sup> This presentation of a mental disorder with primarily physical complaints in young people is also consistent with what has previously been reported in adults.<sup>6,7,20,37</sup> This finding thereby extends this now well-accepted observation into the adolescent age group. With regard to clinical implications, this emphasises that community HCPs should not assume a physical illness diagnosis when a young person attends with physical complaints, but rather should screen all youth attending a clinic for the possibility of a mental disorder, and follow-up positive screens with appropriate diagnostic assessments. Further research is necessary to determine if there are any unique patterns of physical complaints voiced by youth who primarily present with a mental disorder compared to those who primarily present with another type of illness. However, this observation speaks to the necessity of training community HCPs to consider mental disorders in young people as a diagnostic possibility even in the presence of physical complaints.

The training programme provided in this intervention was based on a Canadian adolescent depression programme, certified by the Canadian College of Family Physicians and adapted for use as part of the IACD project. Thus, training HCPs in a systematic diagnostic process could significantly improve the identification, diagnosis, and treatment of depression and other mental disorders in adolescents attending community health clinics in Malawi and may be appropriate for application in other sub-Saharan African settings.

This study also demonstrates a high level of acceptance among HCPs for applying a comprehensive and systematic diagnostic process using clinic tools in a low-income setting. The HCPs involved in this intervention demonstrated that, after receiving training, they generally applied screening questions, clinical diagnostic interviews, mental status examinations, diagnostic tools (the KADS-6, TASR-Am, TeFA, and a diagnostic checklist) in their clinical work. While this was encouraging, we cannot conclude from these data that similar outcomes would occur in all clinical settings, nor that such a comprehensive assessment protocol would be followed outside of a research driven intervention.

Additionally, not all tools were applied with equal frequency. Screening questions were asked of all clinic attendees and diagnostic tools were applied for those who screened positive. However, tools that assessed functioning (the TeFA) and suicide risk (TASR-Am) were much less consistently applied. Furthermore, the data collection forms indicated that, while most clinicians applied most tools at the time of assessment, there was a marked decrease in record-taking with respect to the tools applied and their respective outcomes during treatment. It was not possible to determine whether this is because the tools were not applied or the application data were not recorded.

While this study did not systematically collect data from HCPs about their decisions regarding which tools to routinely apply, some informal feedback was received as part of the programme evaluation. It was suggested that since the KADS-6 already addressed suicide risk, it was not deemed essential by HCPs to conduct additional formalised risk assessment unless a positive endorsement was noted on the KADS-6. Assessment of functioning (the TeFA) was also not considered as a necessary assessment of symptoms by HCPs. The CGI was more frequently applied than other outcome assessment tools due to the ease of its application. Further research is necessary to determine which clinical tools should be considered essential for use by HCPs in community settings.

Although the patient improvement information was only available for a small subset of youth ( $n = 7$ ) who completed 8 to 12 weeks of treatment, the outcomes were generally positive according to HCPs' CGI ratings. This small number of cases was due in part to the limited assessment period (6 months) for this intervention, thus many young people who were beginning treatments late in the assessment cycle may not have completed a minimum of 8 weeks of treatment by the time data collection ended. However, the quality of ongoing clinical record-keeping was such that we could not determine how many patients had their treatment course consistently monitored and how many dropped out of treatment prior to the 8-week treatment point. For these reasons, while these outcomes are encouraging, we are unable to extrapolate this number to the entire sample. In order to reach such conclusions, this finding requires replication in additional populations, and future interventions will require more attention to improvement of clinical record-keeping by HCPs to allow for appropriate determination of treatment outcomes.

### **Limitations**

Although this study had a relatively large sample size of young people referred from school settings, it is not reflective of the usual identification and community treatment of

depression in adolescents in Malawi. Thus, outside of the unique intervention model applied herein, its findings cannot be extrapolated to the wider population. This was not a controlled study so we cannot conclude that the results described above were solely the result of the intervention provided. However, both the historical and concurrent lack of knowledge about and treatment provided to adolescents with depression outside of this intervention suggest that the positive findings reported are likely to be the outcome of the application of the Pathway Through Care approach.

Data collection challenges from participating clinics may have resulted in findings that are not completely reflective of the impact of the programme on patient outcomes. Many of the data collection forms were not completed as requested with numerous data fields left blank. However, given the design of this intervention, we cannot determine the causes of this lack of completion. Further study of the process of clinical care will be necessary both to determine the reason for the challenges in record keeping observed and how to develop strategies for improvement.

An additional challenge was the loss of some data due to the extreme transportation conditions in Malawi. Many of the clinics were located in isolated rural areas with poor access to main roads, thus the collection of data in a timely manner was not always possible. Furthermore, we experienced damage to some of the data forms during transportation due to adverse weather conditions. Better data collection procedures are also needed in future studies. One possible solution is to integrate additional training on the importance of systematic data form completion in the training model, and to provide hands-on opportunities for participants to practice it their clinical settings. Nonetheless, these data collection challenges are not unique to this intervention. Extensive field experience in Malawi and other low-income countries has led members of our team to appreciate the numerous challenges related to effective record keeping in rural health centres for all medical data. For this reason, larger, more systemic interventions related to general principles and infrastructure needs for patient data collection and storage may be necessary to effectively address this issue.

### **Conclusions**

The application of a Pathway Through Care framework that links school-based mental health literacy with teacher identification and referral of young people to trained HCPs has demonstrated numerous positive outcomes with respect to identifying and treating adolescent depression. First, teachers have successfully learned to identify and refer youth who meet the diagnostic criteria for depression to local HCPs. Second, training community-based HCPs has demonstrated its effectiveness in equipping them to systematically and successfully screen, diagnose, and treat adolescents with depression. Given that similar results were found in the application of this approach in Tanzania,<sup>25,38</sup> this Pathway Through Care approach may have the potential to effectively address the burden of depression among youth in sub-Saharan Africa. Further rollout evaluations of this intervention in other sub-Saharan African or low-income countries are warranted.

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## Competing interests

The authors declare that they have no potential conflicts of interests.

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