Title:

Developing a mental health measurement strategy to capture psychological problems among lower caste adolescent girls in rural, south India.

April Mazzuca[1], Dawood Nagarchi[2], Satyanarayana Ramanaik[2], Raghavendra T.[2,] Prakash Javalkar[2], Sarojini Rotti [2], Parinita Bhattacharjee[2], Shajy Isac[2], Alex Cohen[1] and Tara Beattie[1].

[1]London School of Hygiene and Tropical Medicine, 15-17 Tavistock Place, London, UK.
[2] Karnataka Health Promotion Trust, Bangalore, India

april.mazzuca@gmail.com, dawoodn@khpt.org, satya.csp@gmail.com, raghavt@khpt.org, prakashj@khpt.org, parinita@khpt.org, shajyisac@khpt.org, alex.cohen@lshtm.ac.uk, tara.beattie@lshtm.ac.uk

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Corresponding author: April Mazzuca, School of Population and Public Health, University of British Columbia, 2206 East Mall, Vancouver, BC Canada V6T 1Z3
E-mail april.mazzuca@alumni.ubc Tel. 1.867.333.1503

Authors Biographies:

April Mazzuca, MSW, MSc, is a doctoral student in Population and Public Health at the University of British Columbia. Dawood Nagarchi Satyanarayana Ramanaik, PhD, is a researcher with Karnataka Health Promotion Trust, Bangalore, Karnataka, India. Dr. Ramanaik researches

Abstract

Introduction: Adolescent girls vulnerable to early marriage and school drop-out in rural India may be at elevated risk of psychosocial problems. However, few screening instruments have been culturally adapted and validated to measure this risk. This paper describes the process by which the Primary Health Questionnaire (PHQ)-9, a screening instrument for depression, was tested for cultural validity as part of the *Samata* evaluation - an intervention to support low caste adolescent girls in rural south India, to attend and complete secondary school and to delay marriage until adulthood.

Methodology: Three focus groups discussions (FGDs) were held with 20 adolescent girls and six outreach workers of the *Samata* programme. The FGDs were used to explore local expressions of psychosocial problems and to understand the acceptability and appropriateness of PHQ-9 items. A thematic content analysis was conducted on the transcripts of the FGDs.

Results: Descriptions of local expressions of psychosocial problems generally matched the items on the PHQ-9. However, not all representations of psychological symptoms were captured by this tool. Persistent worry, loneliness and isolation, and externalised behaviours were also described by participants as common expressions of psychosocial distress.

Conclusion: Based on the limitations of translation methods, and the challenges of establishing criteria-related validity, local stakeholders must be involved in evaluating the cultural

appropriatness of mental health screeing tools. The current research demonstrates a strategy by which to assess the cultural validity of Western psychiatric instruments with key stakeholders in low and middle-income settings.

Importance of Adolescent Mental Health

Mental disorders present significant challenges to the health and wellbeing of the young, and are a large contributor to the disease burden in adolescence (Mokdad et al., 2016; Patel et al., 2007). Yet, action from the global health community has been minimal (Mokdad et al. 2016; Petroni, Patel, & Patton 2015), especially for adolescents in low and middle-income countries (LIMC) (Davidson Grigorenko, Boivin, Rapa, & Stein, 2015). Little is known about the development of mental disorders among adolescents in LMIC, which is concerning given the adversities youth face in these contexts (e.g. poverty, conflicts, gender discrimination, and inadequate access to education) (Davidson et al., 2015).

Of particular concern are adolescent girls in LMIC, a group which experiences gender discrimination, such as child marriage, sexual harassment, and exclusion from education (Davidson et al., 2015; Petroni et al., 2015). In India, this is particularly evident among adolescent girls from Scheduled Caste families, previously known as ‘untouchables,’ and Scheduled Tribes, communities living in tribal areas of India (Government of Karnataka, 2008). These girls are at increased risk of child marriage (before the age of 18) or to become sex workers — a situation that exposes them to HIV infection and often ends their education (Raghavendra & Anderson, 2013). The literature, albeit it small, does suggest an association between gender discrimination and mental health (Aaron, Bose, & Abraham, 2004; Petroni et al., 2015). Rates of suicide and suicidal ideation among female south Indian youth are several fold

higher than reported in other parts of the globe (Aaron, Bose, & Abraham, 2004), and this increased risk has been associated with gender discrimination (Bhola, Rekha, Sathyanarayanan, Daniel, & Thomas, 2014; Pillai, Andrews, & Patel 2009) and social exclusion (Manorjitham et al., 2010). Research from Africa and south Asia have also found that girls engaged or married as minors are vulnerable to depression and suicidality, in great part to its link with varying forms of gender-based violence (e.g., forced marriage and spousal violence) (Raj, 2010).

To reduce this gap in global mental health research, documentation and monitoring of adolescent girl's psychological health must be implemented (Kohrt et al., 2011; Petroni et al., 2015). Screening tools are an essential component in measuring the magnitude of mental health problems, and to identify risk and protective factors, which in turn, informs interventions and evaluation strategies (Ali, Ryan, & De Silva, 2016; Kieling et al., 2011; Petroni et al., 2015).

Measurement of Mental Health

Before studying the burden of psychological distress among adolescent girls, it is necessary to ensure that the tools we use to measure mental health are not only reliable, but also feasible and culturally valid (Robinson, Metzler, & Ager, 2014). A conventional strategy for cross-cultural validation has been to evaluate the capacities of screening instruments that identify probable cases, such as depression, and compare these capacities to the accepted gold standard tests, such as a clinical diagnostic interview by a local clinician (i.e., criterion validity)(Kaiser, Kohrt, Keys, Khoury, & Brewster, 2013; Kohrt et al., 2011; Sweetland, Belkin & Verdeli, 2014). However, gold standard validation is time-consuming, expensive and resource intensive, and thus, may not be feasible in many LMIC settings (Kohrt et al., 2011; Sweetland et al., 2014; van Ommeren, 2003).

The most common method for adapting mental health screening instruments is to translate Western instruments into the local language (Traube, Dukay, Kaaya, Reyes, & Mellins, 2010). Often, the screening instrument is then used without further assessment (Kohrt et al. 2011; Sweetland et al., 2014). However, it is not always clear if items on an instrument can be translated and applied cross-culturally in such a simplistic manner (Bass, Bolton, & Murray, 2007; Betancourt, Speelman, Onyango, & Bolton, 2009; Bolton, Neugebauer, & Ndogoni, 2002; Kohrt et al., 2011; Tsai et al., 2013).

Based on the limitations of translation, and the challenges of establishing criteria-related validity, there is a need to validate screening instruments by involving key stakeholders to understand local concepts of psychological distress (Bass et al., 2007; Bolton, 2001; Brown et al., 2013; Kaiser et al., 2013; Haroz et al., 2014; Rasmussen, Basila, Keller, & Wilkinson, 2011; Smit, van den Berg, Bekker, Seedat, & Stein, 2006). Several efficient and low-cost qualitative research methods have been used to guide the selection and adaptation of instruments to local settings (Bass, Ryder, Lammers, Mukaba, & Bolton, 2008; Kaiser et al. 2013; Betancourt et al., 2009; Betancourt et al., 2012; Smit et al. 2006). An example of a rapid ethnographic method is “Free Listing”, which is used to identify local expressions of psychological distress (Bass et al., 2008; Betancourt et al., 2009; Bolton et al., 2002). This approach has been used successfully with adolescents in LMIC settings (Betancourt et al., 2009; Ng, Kanyanganzi, Munyanah, Mushashi, & Betancourt, 2014). For instance, using this method, Betancourt et al (2012) was able to identify a Western screening instrument to match local expressions of depression of children in Rwanda, which resulted in a cross-culturally validated measure.

Moreover, van Ommeren et al (1999) outlined an effective method for the cultural adaptation of Western instruments. This method, too, has been utilized successfully with children

to adapt and validate screening instruments in a LMIC setting (Kohrt et al., 2011). At the core of transcultural adaptions are FGDs with community members, where participants assess the acceptability, relevance (i.e., content equivalence), and comprehensibility (i.e., semantic equivalence) of each item in the screening instrument (Kaiser et al., 2013; Kohrt et al., 2011;van Ommeren et al., 1999).

Mental Health and the Samata Intervention

In India, gender norms frequently intersect with other important structural factors, such as caste and rural residence, to influence age at marriage and to limit women's access to formal education and economic opportunities (Carswell & De Neve, 2013; Harriss-White, 2012). 'Samata' is a comprehensive intervention in rural north Karnataka, south India, which aims to delay child marriage and prevent child entry into sex work by increasing entry into and completion of secondary school education for lower caste adolescent girls in North Karnataka, south India. This multi-level intervention is being assessed through a cluster-randomised control trial (RCT) design (Beattie et al., 2015). In addition to evaluating educational and marriage outcomes, the research team was interested in understanding the impact of child marriage, school dropout, and other factors on adolescent well-being and psychological health in this setting. Researchers were also interested in understanding if the 'Samata' intervention had a positive impact on the psychological health of adolescent girls. However, there was a paucity of literature on the most appropriate mental health screening tools for this key population.

The research team originally selected the Primary Health Questionnaire-9 (PHQ-9) (Kroenke, Spitzer, and Williams, 2001), a nine-item depression module, to measure the presence and severity of psychological problems among adolescent girls who participated in the cluster-

RCT surveys. This screening instrument was selected because it was perceived to have brevity, ease of delivery, and comparability to other studies. Originally, the PHQ-9 was designed to measure depressive symptoms in adult populations; however, of late, it has been increasingly used and validated for use with adolescents and young adults (Adewuya, Ola & Afolabi, 2006; Ganguly, Samanta, Roy, Chatterjee, Kaplan, & Basu, 2013; Richardson et al., 2010; Tsai et al. 2014). Further, the PHQ-9 has been validated with an urban population of adolescents in Kolkata, India (Ganguly et al., 2013).

Aim and Objectives

The aim of our study was to assess whether the proposed mental health measurement strategy captured local expressions of mental health among adolescent girls in north Karnataka. As the PHQ-9 was recommended, the Samata research team wanted to determine whether this screening tool would be an acceptable and appropriate (i.e., comprehensible and relevant) measure to assess mental health problems among adolescent girls as part of the evaluation of the Samata intervention. Specifically, concerns were raised about the following: 1) semantic equivalence, i.e., whether the girls would understand the meaning of PHQ-9 items 2) content equivalence, e.g., the appropriateness of the item relating to appetite and weight loss (‘poor appetite or overeating’), because the girls were from poor rural communities; and, 3) acceptability of items, e.g., whether it was acceptable to ask about suicide and self-harm (‘thoughts that you would be better off dead or of hurting yourself in some way’) because of the sensitivity of this topic in Indian culture.

The study objectives were to:

i) Explore local perceptions of mental health problems among adolescent girls. This would allow us to determine if local mental health problems were addressed in the PHQ-9.

ii) Assess the comprehensibility (i.e., semantic equivalence), relevance (i.e., content equivalence) and acceptability of the items on the PHQ-9.

The study findings would be used to inform the mental health measurement tool used in the Samata evaluation.

Methods

Setting and interviewers

The study was conducted in Bijapur and Bagalkot, north Karnataka, where the Samata programme is being implemented. The project covers 3,600 girls, ages 12 to 17, from 119 villages and 69 schools in these two districts.

Three researchers (two females and one male) were present at each FGD. The lead facilitator (research coordinator at KHPT) led the FGDs with the assistance of a clinical social worker and local staff member. Two researchers were trained in qualitative interviewing methods; one was bilingual (*Kannada* and English). The third researcher had experience in conducting workshops with youth and supervising the Samata programme. The FGDs were conducted in the local language, *Kannada*. Prior to the interviews, the research team translated the PHQ-9 to *Kannada* and then back-translated items to ensure they retained their original meaning. All qualitative interviews were conducted by researchers, with one interviewing participants and the other two recording the responses, which enabled the facilitator to use probes to explore local psychosocial constructs.

Participants and sampling method

The study participants were adolescent girls and outreach workers from the Samata programme. We interviewed a convenience sample of adolescent girls from the Samata intervention communities. These girls were members of the *parivartan* sports group - an established recreation sports group of the Samata programme. Twenty girls aged between 15 and 16 years, from poor SC and ST backgrounds, labouring families, participated in two FGDs (13 from Bijapur district and 7 from Bagalkot district). The participants were enrolled in secondary school, 8th and 9th standard, at the time of the study.

A convenience sample of six outreach workers from Bijapur, who had been working with KHPT for between 3-10 years, were also interviewed. We could complete only one FGD with outreach staff because of limited time and available staff to assist in translation. Bijapura district was chosen for this outreach worker FGD because this community had the most experienced Samata workforce.

Interviewing methods

Using techniques described elsewhere (Betancourt et al., 2009; Colucci, 2007), we used a rapid ethnographic method, based on the Free Listing technique, to conduct FGDs with adolescent girls and outreach workers. The Free Listing exercise can be used in focus group discussions (FGDs) (Colucci, 2007; Ellsberg and Heise, 2005); and is a technique that lists answers in response to a primary question. This rapid ethnographic method was designed to explore local mental health concepts, priorities, and the applicability of Western psychiatric concepts among this sample population.

The Free Listing question was "What are the problems faced by girls in your community?" Interviewers probed for a number of problems and generated a list. Their responses were recorded on a large piece of paper. From this list, as a group, each FGD prioritised the major problems in their community ('Can you tell us what problems affect girls most in your community'). We focused on six leading problems, and the participants were asked to provide a short description of each. This list of problems was then probed for descriptions of associated thinking, feeling and behaviour to explore prevalent psychosocial issues.

To explore the appropriateness and acceptability of PHQ -9, we attempted to present participants with each item in the instrument. The PHQ item on suicide and self-harm was excluded, as community members perceived this to be too sensitive an issue to be addressed in the FGD with the girls. The acceptability of the suicide and self-harm item was discussed in the outreach worker FGD. The cultural translation method described elsewhere (Kaiser et al., 2013; Kohrt et al., 2011; van Ommeren et al., 1999) was used as a guide. Interviewers probed each item for comprehension, relevancy and acceptability. We audio-recorded all responses, as well as taken notes.

Data analysis

A thematic content analysis (Smith, 1992) of FGDs was conducted using NVivo 10. Coding and analysis of transcripts were conducted by the lead author, in consultation with the second, third and last two authors. Key themes of our research objectives were incorporated into a thematic framework including: (a) local concepts of mental health problems and manifestations, and (b) the domains of transcultural translation, namely, comprehensibility (i.e.,

sematic equivalence), relevancy (i.e., content equivalence) and acceptability as described by van Ommeren et al (1999).

After becoming familiar with the transcripts and NVivo coding, the framework was modified to include themes derived inductively from our dataset. The dataset was then coded using this framework and analysis was undertaken. Results were reviewed and approved by local research associates of KHPT. We present the results as narratives describing key themes, using excerpts from participants' quotes.

Community collaboration and ethics

The topic guide and data collection were created and undertaken in partnership with local research associates and the programme implementation team of KHPT. The study obtained ethical approval from St. John Medical College, Bangalore, India, Hospital Institution Ethics Committee and the LSHTM Ethics Committee, London, UK. Informed consent was obtained from care-givers (parents / guardians) and outreach staff; informed assent was obtained from adolescent girls. Adolescent girls and their families did not receive monetary compensation; they were provided with breakfast and lunch before and after the FGDs.

Results

Local expressions of mental health

In the Free Listing exercise, adolescent girls and outreach workers revealed a range of problems faced by girls in their respective communities. As a group, each FGD prioritised the problems that posed challenges for girls: child marriage, harassment (including sexual harassment), eve-teasing (unwanted sexual remarks or advances by boys and men to girls in

public), gender discrimination (e.g. dropping out of school to care for their siblings while their brothers continued their education), falling in love, and distance to school, poverty, migration and menarche were all cited (Table 1).

Table 1: Main problems emerging from free listing exercise (N =3 FGD)

*AG Bijapur (n =13)	*AG Bagalkot (n=7)	*ORW Bijapur (n=6)
Harassment	Child Marriage	Gender Discrimination
Child Marriage	Eve-teasing	Child Marriage
Falling in Love	Teachers misbehaviour (harassment)	Eve-teasing
Gender Discrimination	Gender Discrimination	Migration
Eve-teasing	Poverty	Falling in love
Menarche	Distance to school	Poverty

Note. Eve-teasing is a euphemism used in India for a form of sexual harassment of females by males in public spaces. Behaviours of boy and men include: staring, touching, pinching and or making indecent remarks or gestures towards girls (Dhillon & Bakaya, 2014).

*Adolescent girls (AG) and outreach workers (ORW)

When psychosocial themes (i.e., feelings, thoughts, and behaviours linked to problems listed in Table 3) were analysed, local symptoms or features shared similarities with the Diagnostic Statistical Manual of Mental Disorder (DSM-V) definition of Major Depressive Disorder (MDD) (American Psychiatric Association, 2013). These included crying, sadness and withdrawal, “alone, they won’t speak to anyone…” Other features were: shame: “spoiled their family name”, worthlessness and irritability: “she becomes atypical…express anger towards all”; and suicidal ideation: “sometimes evil thoughts of committing suicide arise”**.** Further, as

illustrated below, outreach workers describe how depression presents in adolescent girls when they are married off and forced to discontinue their education.

> *"…feeling deprived of everything desired could make her go into deep mental pains, might make her lose interest in everything, losing focus /attention, non-responsive to anybody's calls… they would be unable to consume and digest food, not getting proper sleep and even if they sleep, could not be able to do it properly and thinking deeply about the same desire* (desire to continue their education). *Usually those who are suffering with depression would behave like this only."*

Thoughts resembling depression and suicide were: "wishing they had never been born", "not wanting a girl child', "think of her birth as a curse" and "not wanting to be seen around". As illustrated below, outreach workers described the connection between feelings of hopelessness and suicide among adolescent girls.

> *"Thinking of such possible negative developments* (imaginary) *about her future life, she might decide to take the extreme drastic step of committing suicide and ending her life forever."*

Girls appeared to isolate themselves when faced with adversities, such as child marriage or "eve-teasing". Feelings of isolation recounted by adolescent girls were, "sitting in silence", "crying alone", and "not talking to anyone", "sitting alone carrying their thoughts and worries". When we queried the expression of sadness by girls, they replied "to whom are we to express it to?" Some participants remarked that they had no one to talk to and no one to listen to them. One of the adolescent girls commented:

> *"They remain silent even at school. And while going out, if they come across any known persons they start looking downwards. They do the same thing even at school."*

Other psychosocial problems, such as constantly worrying and thinking, and difficulty concentrating and sleeping were similar to symptoms of Generalised Anxiety Disorder (GAD),

but also overlap with Major Depressive Disorder as defined in DSM-V (American Psychiatric Association, 2013)**.** The girls reported avoidant behaviours due to intense fear of eve-teasing. For example, to escape from such insults girls would travel longer distances, only travel with friends or, if friends were not present, not go to school.

Externalised behaviours, such as verbal aggression, frustration, angry glares and disobedience, were also cited, which mirrored the expression of depression in youth in DSM-V (American Psychiatric Association, 2013). However, outreach workers recalled more externalised features compared to the adolescent girl groups.

Protective and risk factors

Other emergent themes were linked to protective factors that helped girls cope with problems they encountered in their community. Participants reported the assistance they received from external interventions, such as the Samata programme, to help girls avoid child marriage. Participants also cited involvement in activities - singing, dancing and playing with friends as being helpful. However, the presence and support of a system, friends and family, were critical to helping girls deal with the problems they faced.

The potential risks of mental health problems could be identified when the participants mentioned not having anyone to talk to or support them. When asked how they expressed their feelings, they replied: “Who do we share it with?” Participants frequently cited that no one, particularly family members, listened to or believed them, and they were scolded and blamed if boys ‘teased’ them.

Key indicators from FGDs of depression/anxiety features are presented in Table 2.

Internalised Feelings	*Internalised Thoughts*	*Internalised Behaviours*
Sadness	Thoughts will be somewhere else	Limit their mobility to their home
Inferior/degrade	Not smart	Looks dull
Crying	I ruined my life	Lack interest in school
Panic mood	Pessimistic attitude about the future	Won't speak to anyone
Go into depression after deep troubles	Anxiety around her fate and image	Keep worrying all alone
Sorrowful mood	Keep worrying	Do not react to others
Ashamed	Thinking of committing suicide	Don't eat
Hurt	Worrying about incidents	Don't talk to anyone
Mental pain/mental suffering	Impression of being nothing	Sit quietly in the house
Scared	Lots of thoughts	Not paying attention
Fearful		Never come forward to participate She will hesitant about everything
Repenting/Guilt		Simply obey the guidance their parents
		Keep silent.
Externalised feeling and		

Table 2: Indicators of depression and anxiety features described in FGDs

thoughts	*Externalised Behaviours*
Anger	Anger when speak to others
Frustration	Beating others
Jealousy	Atypical always expressing
Angry at everybody	anger towards others
Wish to beat them	Angry without reasons
	Doesn't smile at elders, look them with anger
	Rebellious attitude
	Disobey their parents
	Arrogant behaviour
	Not listen
	Restless
	Lack of patience
	Running away
	Anger towards a small comment

Note. These are key words and statements used to describe how girls feel, think and behave when they experience the problems common to their communities.

Appropriateness of PHQ-9: *Semantic equivalence of PHQ-9*

When semantic equivalence was examined, no participants reported difficulty with the *Kannada* terminology used in PHQ- 9, except for the word ‘depressed’. The outreach workers stated that this word is not used in rural villages. Some girls cited that they had never heard the word ‘depressed’ before, but when the facilitator asked them about ‘mental depression’, they identified it as agony (‘mental pain’ or ‘mental suffering’). The outreach workers also believed the girls would not understand ‘feeling down’ (translates in *Kannada* to ‘disturbed lowness’) because it is seldom used in the villages.

Appropriateness of PHQ-9: *Content equivalence of PHQ-9*

Content equivalence was undertaken to determine if the items were relevant to the overall constructs of depression (Kohrt et al., 2011). Modifications to PHQ-9 items, based on FGD comments, are presented in this section and illustrated in Table 3.

PHQ-9 items associated with depression

Three PHQ-9 items were endorsed by each FGD as having a connection to depression. These items are presented below.

PHQ-1: Feeling down, depressed and hopeless

When we asked what this item meant to them, adolescent girls referred to “becoming mentally upset” “mental pain”. These feelings were associated with being insulted by others, being forced to drop-out of school, child marriage and eve-teasing by boys.

It was suggested that girls better understood the Kannada translation of mental stress, psychological pain or mental suffering over ‘depression’. As the girls associated ‘mental suffering’ with sadness and thoughts of suicide, this term would help connect the item to feelings of sadness. Hence, we proposed that this item to be changed to: ‘Feeling sad, mental pain and hopeless’.

PHQ-2: Feeling bad about yourself - that you are a failure or let your family down

This item was related to feelings of guilt and shame. In one FGD, girls gave an example of taking exams without being adequately prepared and hence copying the answers. In such cases, they felt guilty. Others recounted stories of making an error during a class lesson, which left them feeling bad and ashamed of themselves. The word ‘shame’ was used during the Free Listing exercise, when girls spoke of bringing shame to their family by falling in love with a boy. We proposed this item be changed to: ‘Feeling bad about yourself, feeling ashamed, or that you have let your family down’.

PHQ-3: Thoughts that you would be better off dead or of hurting yourself in some way

We were unable to present this item to the adolescent girl groups, as there were concerns the item on suicide would be too sensitive an issue to be addressed in a group discussion. The outreach workers stated that adolescent girls would be less likely to give an honest response if asked about suicidal thoughts directly. Given their work experience in the villages, outreach workers commented on how girls may feel anxious that this information would be disclosed to families and community members. Thus, based on their recommendations, we proposed using ‘Thinking life was not worth living’, as an indicator of suicidal ideation. Although many of the

adolescent participants discussed suicide openly in FGDs, their candour was connected to conversations about their peers' experiences, not their personal stories.

PHQ-9 items associated with anxiety symptoms

Other items were endorsed by each FGD to having a connection to anxiety, such as 'trouble falling sleeping, staying asleep', 'loss of concentration' and 'poor appetite'.

PHQ-4: Trouble falling asleep, staying asleep or sleeping too much

Overall, this question was connected to feelings of anxiety and tension. The primary example provided was about boy(s) teasing a girl and the girl losing sleep, as she would worry excessively about the incident. Other examples were the demise of a relative (feelings of sorrow), exams and quarrels with friends. The girls also stated feelings of excitement and joys of marriage or a crush on a boy could disrupt their sleep. However, adolescent girl FGDs remarked that 'sleeping too much' was associated with someone who had no tensions, because someone who can sleep through the night has no worried thoughts. We recommend 'sleeping too much' be dropped from this item, and replaced with: 'Trouble falling asleep, or staying asleep at night'.

PHQ-5: Trouble concentrating on things, such as reading or chores

This item was mainly associated with feelings of worry. For instance, one FGD commented that if anyone teased them en route to school, they would not be able to concentrate on their teacher's lecture, because they would be thinking of the incident. However, loss of concentration was also associated with loud noises coming from outside the classroom or home, and excitement and anticipation of wedding ceremonies in the community. These items were mentioned as being secondary to worry and tensions. The outreach workers suggested the phrase

'paying attention' over 'concentration' is more suitable. Therefore, we proposed this item be changed to: 'Trouble paying attention to what is going on around you, when someone is talking to you, or while reading'.

PHQ-6: Poor appetite, weight-loss and overeating

This statement provided mixed results. Firstly, one focus group associated less appetite with being busy playing, studying or watching television. However, when we probed further, we found that girls had diminished appetites because they worried about child marriage, eve-teasing and, more generally, worry and tensions. However, actual weight loss was mainly associated with working heavily and continuously, and lack of nutritious food. Excessive eating demonstrated low content equivalence across the three focus groups. It was associated with pregnancy or having no tensions or worries. As poor appetite was mainly associated with worrying, but not weight loss or overeating, we recommend this item be changed to: 'Not feeling hungry even when there was food around'.

PHQ-9 items with a low association to psychosocial problems

No participant endorsed an association between 'little interest or pleasure in doing things' and psychological programs, as well as 'fatigue and little energy' and mental health. There were mixed findings for 'moving slowly or being restless' due to worry and tensions.

PHQ-7: Little interest or pleasure in doing things

For this statement, we encountered challenges in assessing this item's connection to depression, as our facilitator did not present this item directly. Instead she asked the question: "which things are you most interested in and which ones are you less interested in?" rather than

asking about "what does the statement ‘little interest or pleasure in doing things’, mean to you?" The participants then provided comments on activities girls liked to take part in. Therefore, we could not ascertain if this item was connected to depression or not.

Nevertheless, FGDs participants described girls lacking interest in school and/or withdrawing from social activities when feeling mental pain and/or tension. Based on these comments, we proposed that this item be changed to: **‘**Not enjoying activities that you used to enjoy, such as cultural ceremonies, activities in the village or playing with friends’.

PHQ-8: Feeling tired, or having little energy

This statement was connected to weakness due to menstruation. Though, during the Free Listing exercise, several participants connected feelings of weakness to getting scolded and ‘mental trauma’ inflicted by their mother-in-law. Therefore, we recommend the following statement: ‘Feeling weak or tired doing day to day tasks’. To ensure this item is not confused with working hard, we suggest the following qualifier: ‘this weakness is not from working too much or too hard’.

PHQ-8: Moving slowly or being restless

Mixed findings emerged for this statement. Across the three FGDs, ‘moving or speaking slowly’ was associated with being scolded, worried or birth abnormalities, and environmental factors such as the family walks and talks in a slow manner. Being told by family members to walk or talk quietly or slowly was also mentioned. Therefore, it might be culturally appropriate for girls to behave in this manner. In the Free Listing exercise, however, adolescent girls spoke of a fellow classmate looking and acting “dull” because she had mental pain/depressed. One

focus group with adolescent girls, associated being ‘restless and moving around’ with worry and tensions, but other girls associated ‘moving around’ with being born a hyperactive child or freedom to wander around the village.

The item ‘talking slowly or moving around really slow’ did not appear to match psychomotor retardation symptoms associated with depression. To enhance clarity and relevance to psychomotor retardation we proposed the following qualifier: *‘Do you feel like it takes a lot of effort to walk and talk'*. For the second statement, we would suggest using the words nervous/anxious for clarity. Based on their comments, we proposed the following modification: *‘Being so worried or anxious that you move around a lot– or are fidgety.*

However, there were concerns associated with multiple or opposite questions within one sentence (e.g. PHQ-9 item: ‘*Moving or speaking so slowly that other people could have noticed. Or the opposite; being so fidgety or restless that you have been moving around more than usual’* and *‘Trouble falling/staying asleep, sleeping too much’*), as it might be confusing to the girls. Although we did not inquire if multiple statements within one sentence was confusing or not, we believe it could be challenging for participants to answer. Hence, we proposed this question is separated into two distinct statements for the survey.

Acceptability of PHQ-9 items

In the FGDs, participants found PHQ-9 to be an acceptable questionnaire to be carried out in their communities. The participants were candid in their discussions regarding psychosocial problems, including suicidal ideation, as seen in the Free Listing exercise. Although suicide and self-harm is a sensitive question, the outreach workers found it acceptable

to be included. However, they cautioned around reporting bias, as girls may think this information will be shared with their family members.

Manifestations of psychosocial problems not captured in PHQ-9

As illustrated in the Free Listing exercise, anxiety, isolation and aggressive outbursts were mentioned often by participants in FGDs. These manifestations of psychological distress were deeply connected to adversities girls faced in their communities. However, these features are not directly addressed in PHQ-9**.** As a separate questionnaire related to these expressions is not feasible, we propose including supplementary items in addition to using the PHQ-9 to capture worried thoughts, and externalised and internalised behaviours.

Presentation of the mental health survey

Questions related to mental health can be sensitive, particularly questions related to suicide and self-harm for reasons mentioned above. Based on discussions with the outreach workers, researchers must ensure that confidentiality is understood, and mental health experiences are normalised for adolescent girls to make them feel comfortable. Thus, we recommend an introductory statement to the PHQ-9, which reinforces discretion and normalcy of emotional stress.

The modified PHQ-9 and the supplementary questions recommended based on the above findings, is presented below in Table 3.

Table 3: Modified mental health measurement tool

Instructions: Emotional health and well-being impacts all of us. We all have times when we feel sad, angry and worried, and it is normal to have all these feelings. Sometimes it is hard to talk about our feelings. We may feel shy or worried that other people in the community will find out about our feelings. We want you to know that your answers are kept confidential and safe. The purpose for asking these questions is to help the Samata team know about the emotional health of girls, to support them in a better way.

Over the past two weeks, how often have you been bothered by any of the following problems:

1) Feeling sad, mental pain, or hopeless.

2) Trouble falling asleep or staying asleep at night

3) Trouble paying attention to what is going on around you like, when someone is talking to you, or while reading.

4) Not enjoying things like you used to.

Qualifier: 'Taking part in cultural ceremonies or activities in community or with friends like you used to'

5) Feeling weak or tired doing day to day tasks at home or at school

Qualifier: 'This weakness is not from heavy work or working too much'.

6) Feeling less hungry than you used to, even when there was food around

7) Talking slowly or moving around really slowly

Qualifier: 'Do you feel like it takes a lot of effort to walk, talk or think?'

8) Feeling worried/anxious that you move around a lot or are fidgeting a lot more than usual.

9) Feeling bad about yourself, feeling ashamed, or that you have let your family down

10) Thinking life was not worth living

Supplementary items

11) Taking your anger out on someone else for no reason

12) Feeling worried or anxious

13) Not being able to control or stop your worried thoughts

14) Feeling lonely, like you have no one to talk to

Discussion

Based on the qualitative findings, we were able to assess if PHQ-9 was an appropriate and acceptable instrument to measure the psychological health among adolescent girls in rural south India. Overall, our findings suggest that this instrument captures the presentation of depressive symptoms of adolescent girls in this context. Though psychological distress was not included by groups in the Free Listing exercise of problems girls face in their communities, psychosocial problems were deeply connected to adversities, such as gender discrimination (e.g. eve teasing, child marriage) and poverty. Adolescent girls and outreach workers described psychosocial challenges that appeared to share similarities with depression and anxiety-like features as outlined in the Diagnostic Statistical Manual of Mental Disorder V (DSM-V), thus reflective of Western psychiatric concepts presented in PHQ-9 (American Psychiatric Association, 2013) (Kroenke, Spitzer & Williams, 2001). Our findings were comparable to other studies in LMIC settings (Betancourt et al., 2009; Pillail et al., 2009); the expression of depression and anxiety symptoms were parallel to Western psychiatric concepts.

Many of the PHQ-9 items were associated with psychological distress; however, three items were low on content equivalence: ‘slow movement and restlessness’, ‘tiredness and fatigue’ and ‘little interest and pleasure doing things’. Nevertheless, weakness and decreased participation in activities were expressed by several participants in the FGDs in connection with emotional distress. To increase their relevancy, we modified the items to match local idioms expressed in the FGDs. For instance, the word ‘weakness’ replaced ‘fatigue’, as this term was used to describe the mental trauma girls experience from getting married at a young age. It should be noted that the item related to psychomotor changes was challenging to modify because it was unclear if these items, particularly psychomotor retardation, were connected to symptoms

of psychological distress. We did modify statements based on comments from FGDs and included words, such as ‘worried’ and ‘anxious’ to increase the relevancy this item. This modification to the PHQ-9 was used in Esler, Johnston,Thomas, & Thomas (2008), and the authors reported that the adapted instrument maintained good psychometric properties. However, further qualitative work is needed to explore the relationship between psychomotor changes and depression-like symptoms in this population (Bennabi, Vandel, Papaxanthis, Pozzo, & Haffen, 2013).

Slight modifications to each item of the PHQ-9 were required to increase their relevancy. For example, for the item ‘sleeping too much, trouble staying a sleep’, participants associated ‘sleeping too much’ with an individual who is free from worries and tension, whereas ‘problems falling asleep’ was connected to the presence of worry. Opposing statements may create confusion for interviewees (Brown et al., 2013; Poongothai et al. 2009); therefore, conflicting statements within an item, unconnected to mental health, were discarded. The psychomotor item also contained opposing questions; however, we separated this item into two distinct questions, as both statements appeared to be associated with mental health. Previous studies made a similar modification to the PHQ-9 to enhance clarity for participants (Brown et al. 2013; Poongothai et al. 2009). We also incorporated local idioms, such as ‘mental pain’ as this term was used to describe depression in rural areas of northern Karnataka. A number of qualifiers were also provided to further enhance relevancy, by providing culturally appropriate examples based on findings from FGDs. Esler, Johnson, and Thomas’s (2007) evaluation of PHQ-9 called for more “flexibility” within the tool to allow the interviewer to alter wording and provide context-specific examples to enhance cultural validity (pp.262). By incorporating these recommendations into the PHQ-9, researchers found the adapted instrument to demonstrate good reliability and validity in

detecting depression among Indigenous population in Australia (Esler et al., 2008). Further, Gail et al. (2016) recent systematic review of validated screening tools in LMIC, found that the best performing tools were those that were locally adapted.

The rate of suicide in south India is reported to be highest amongst young women in comparison to young men (Aaron et al., 2004). Additionally, in the focus groups, adolescent girls discussed the association between suicidal thoughts and gender discrimination young women face in their communities. Suicidal ideation is an important aspect of mental health for this population; however, the intervention team was concerned that it would be unacceptable to inquire about self-harming behaviours in the villages, as suicide is illegal and highly stigmatised. Our data suggests their reservations were unfounded; during the Free Listing exercise, the outreach workers understood this question to be acceptable. Moreover, by avoiding questions of self-harm, we may reinforce stigma and further isolate those at risk of suicide.

However, outreach workers cautioned against the use of the original PHQ-9 item, 'thoughts you were better off dead, or of hurting yourself in anyway', as reporting bias linked to issues of confidentiality was likely. The outreach workers recommended a non-intrusive approach to addressing suicidal thoughts to minimize reporting bias. We proposed 'thinking life was not worth living', to alleviate participants' stress in disclosing their experiences with suicidal thoughts. This statement has been used in the literature as an indicator of suicidal ideation (O'Dwyer, Moyle, Pachana, Sung, & Barrett, 2014; Thomas, Crawford, Meltzer, & Lewis, 2002).

Although self-harm behaviours is a topic that is prone to under-reporting due to legal and social consequences in India, measures can be taken to minimize under-reporting (Pillai et al.,

2009). For instance, in Pillai et al (2009), participants were made aware of the precautions taken to maintain their anonymity. van Ommeren et al. (1999) used a similar design to investigate alcohol use amongst women in Nepal, a cultural taboo. Therefore, introducing the mental health questionnaire by including a statement to reinforce confidentiality and normalise mental ill-health will be important to minimize reporting bias.

Although the PHQ-9 appeared to share similarities to the expression of depressive symptoms in this population, persistent worry, isolation, and externalised behaviours were common representations of mental health not captured by this tool. Although anxiety was connected to trouble sleeping, poor appetite and concentration, there were no items in PHQ-9 which directly addressed the frequency of worried thoughts. As anxiety features were cited often in relation to the adversities girls face in their communities, we believe that including anxiety-related items in the questionnaire is important to accurately measure their psychological health. Therefore, we recommend the inclusion of the GAD-2, as it demonstrated relevancy based on FGDs and has brevity. Although the GAD-2 is seldom used with adolescents in LMIC, this measure has demonstrated good validity when used in diverse settings (García-Campayo et al., 2012).

Internalised behaviours were cited repeatedly across the focus groups. Girls appeared to keep feelings of sadness and anxiety hidden from others, isolating themselves within their home when experiencing troubled thoughts. The striking fact was that girls felt like no one would listen to them. Social isolation can have devastating consequences to the emotional well-being of adolescents. Manoranjitham et al. (2010) found that psychological stress and social isolation, over psychiatric morbidity, were major risk factors leading to suicide in rural South India.

Therefore, an item which captures the loneliness and isolation attributes of sadness would be essential, and further enhance the local validity of this instrument.

Lastly, the presence of externalised behaviour was also recounted in FGDs, albeit mentioned less often. They described girls becoming atypical -- becoming verbally aggressive at others for no apparent reason. This was also found in Betancourt et al. (2009) while examining local concepts of mental health in children in a post-conflict setting. Authors perceived this to be reflective of their expression of sadness through irritability, which is a feature of depression in youth (Betancourt et al., 2009; Birmaher et al., 1996). Esler et al. (2007) also found anger as a likely manifestation of psychological distress, and therefore, included it to improve the acceptability and relevancy of PHQ-9. In a subsequent study, the adapted PHQ-9 proved to be a reliable and valid measure (Esler, Johnston & Thomas, 2007). Haroz et al. (2014) also found that with the addition of locally derived items, their instrument had more depth, and performed as well as standardised items.

Limitations

Though this research fulfilled its aim, it had its limitations. The diversity of backgrounds, perspectives and knowledge levels of adolescent girls' mental health was limited. Time and resource constraints made it impossible for us to consult clinical experts in Karnataka, although several attempts were made to include local clinicians. Additional limitations included the small number of FGDs and the homogenous girl sample; adolescent participants were members of the *parivartan* group - a sports group which comprises part of the Samata intervention. Although adolescent girls were from the Scheduled Caste or Scheduled Tribe, they may not be representative of all girls in these districts. In addition, we were unable to assess the acceptability of the PHQ-9 response set (i.e., technical equivalence).

There were several drawbacks to the topic guide and the qualitative data collected. In two FGDs, we were unable to review the PHQ-9 comprehensibly due to time constraints. Many of PHQ-9 items presented were probed for relevancy; however, there were a few items that were only probed for comprehensibility due to time constraints. Two statements from the 9-item questionnaire 'feeling bad about yourself' and 'feeling tired and less energy' were only included in one adolescent girl FGD due to time constraints. Therefore, our assessment of the semantic and content equivalence for these items was limited. Further, we were unable to directly assess the appropriateness and acceptability of the item related to suicide and self-harm with adolescent girls, due to apprehension on the part of the community. Although suicide was discussed openly by adolescent girl participants during the FGDs, their comments were in relation to their peers, not their personal experiences. Thus, our insight into how girls would respond to such a question remains limited, as it is solely based on the opinion of outreach worker participants.

Lastly, the qualitative data set used for this study could have been influenced by the positionality of the investigators as well as the absence of inter-coder reliability.

Conclusion

Despite these limitations, this study supports the feasibility and importance of utilising rapid ethnographic methods to assess the cultural validity of Western mental health concepts. Our findings highlight the importance of researchers moving beyond translation and back-translation of mental health survey instruments to assure cultural appropriateness and acceptability. We illustrate the necessity for the involvement of service providers as well as adolescent girls themselves to assess local mental health priorities, and the acceptability and appropriateness of standardised instruments used in this context. Their

voices were essential in modifying the PHQ-9 and including additional survey items to reflect local indicators of psychological distress. By adapting a Western mental health tool to be more reflective of the communities with which we are working, the risk of misrepresentation and error decreases. An adapted mental health instrument provides researchers with an appropriate tool to measure psychological distress among adolescent girls. In turn, this will contribute to their overall aim of improving the quality of life for adolescent girls in Karnataka. Future research should consider assessing the psychometric properties of the adapted screening measure with this key population.

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