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The development of a screening tool for the early identification of risk for suicidal behaviour among students in a developing country

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Abstract

Objective—Adolescent suicidal behaviour is a public health concern in South Africa. The purpose of this manuscript is to report on the development of a screening tool for teachers to identify South African students who are most at risk for suicidal behaviour. This need is addressed within the context of the limited number of mental health professionals available to provide screening and care services in South Africa.

Method—Grade 8 students participated by completing sociodemographic questionnaires and self-report psychometric instruments. A screening tool for suicidal behaviour was developed using a four phase approach.

Results—Twelve factors for high risk suicidal behaviour were identified and included in the screening tool. While further research is needed to validate the screening tool, the findings provide a useful preliminary starting point for teachers to refer students at high risk for suicidal behaviour to mental health services for treatment.

Conclusion—This screening tool is based on factors that were identified as being associated with suicidal behaviour from local research on South African adolescents. The tool contributes to research on adolescent mental health, particularly suicidal behaviour, in developing low and middle income countries like South Africa, with the aim of creating African prevention and intervention programmes.

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Keywords

Young adolescents; suicidal behaviour; developing country; screening tool

Adolescent suicidal behaviour can include completed suicides, suicidal attempts and/or suicide ideation. Completed suicides among adolescents are increasing worldwide and have already been identified as a significant public health concern in South Africa (Schlebusch, 2005). Moreover, more than 90% of the world's children live in low and middle income countries. These countries account for 75% of global suicides further underscoring the significance of this public health problem (McKinnon, Gariepy, Sentenac, & Elgar, 2016). The suicide rate for children and adolescents in South Africa between ages 5 to 14 years is 1.4 per 100,000 and rapidly jumps to 17.6 per 100,000 for young people between ages 15 to 29 (Matzopoulos et al., 2015). The rate for children and adolescents, ages 5 to 14 years, is double the 0.7 per 100,000 suicide rate reported in the United States (Heise, York, & Thatcher, 2016) but lower than rates reported in developing countries in Central and South America, such as Guyana, with rates of 3.77 and 6.46 per 100,000 for males and females between the ages 5 and 14 years, respectively (Kõlves & De Leo, 2014). Suicide ideation is also prevalent in Africa. African developing countries with low and middle income such as Botswana, Kenya, Uganda and Zimbabwe had a pooled prevalence of 21.6 % for suicide ideation, compared to a prevalence estimate of 1.7% for countries in the Americas (McKinnon, Gariepy, Sentenac, & Elgar, 2016).

While the South African rates seem low relative to some other countries and regions globally, these rates may not be an accurate reflection of the current problem of suicidal behaviour in South Africa. The rates are based upon older data from 2009. In addition, the media in South Africa regularly report suicides among adolescents, further suggesting that suicide is not a rare phenomenon among South African adolescents (Carstens, 2015; Nair, 2010;). Previous research also suggests that the effect of suicide can be widespread and is not limited to the person who commits suicide. For every completed suicide, six people are affected (Schneidman, 1973). Among adolescents, in particular, suicide and suicide attempts may have a serious impact on their peers. Adolescents' suicidal behaviours can lead to an increase in suicidal ideation and attempts among their peers (Prinstein, Boergers, & Spirito, 2001).

Suicide deaths are also often under reported due to the lack of resources (i.e., few pathologists to diagnose cause of death) and factors such as fears about stigmatizing individuals who have died as well as their survivors. Cultural or religious sanctions can further restrict the reporting of suicides (Schlebusch & Burrows, 2009). This under reporting may be even more pronounced when children and adolescents are involved.

Given the scope and seriousness of suicidal behavior among adolescents in South Africa, the establishment of a national suicide prevention programme has been identified as one of the key areas for public health by the South African Department of Health National Mental Health Policy Framework Strategic Plan, 2013 to 2020 (South African Department of Health, 2012). Previous research suggests that given the limited resources of public health systems, school resources should be used to develop evidence-based suicide prevention and

intervention programmes (e.g., Shilubane et al., 2013; Peltzer, Kleintjies, van Wyk, Thompson, & Mashego, 2008) with school personnel, such as teachers, being involved in screening for a national suicide prevention programme to become fully established (Schlebusch, 2012).

A necessary first step in the development of a prevention programme is to use screening tools to identify adolescents who are most at risk for suicide. Research on the use of various mental health measures for suicide screening of South African adolescents is limited. Measures recommended for use by the South African Anxiety and Depression Support Group include the Patient Health Questionnaire 9 (PHQ-9) developed by Spitzer, Kroenke and Williams in 1999. The PHQ-9 has to be administered by clinicians which limits its use in non-clinical settings such as schools. Another measure used in South Africa is the Youth Risk Behavior Survey (YRBS) developed by the Youth Risk Behavior Surveillance System in the United States for the Centers for Disease Control and Prevention. The YRBS has been adapted by Shilubane and colleagues (2013). However, little research has been done in this area and most of this work has been largely descriptive (e.g., Wild, Flisher, & Lombard, 2004). Issues such as the sensitivity and specificity of screening tools have not been addressed.

Suicide in South Africa

The development of a screening tool for South African adolescents is challenging as research on suicidal behaviour and other mental health problems in developing countries such as South Africa is limited (Joe, Stein, Seedat, Herman, & Williams, 2008). This is due in part to the health transition that South Africa is undergoing, that is characterized as a quadruple burden: the simultaneous occurrence of epidemic infectious communicable diseases, such as HIV/AIDS and tuberculosis, and the rise in non-communicable diseases in a population already facing perinatal and maternal disorders, injury, and violence (Mayosi et al., 2009). Further, the burden of trauma is so widespread that the cover of the October 2015 issue of the South African Medical Journal had as its headline, “South Africa’s fourth epidemic: the ugly face of trauma.” Data on trauma and trauma-related injuries for South Africa indicate that the estimated disability-adjusted life years for intentional injuries is 2,686 per 100,000 as compared to 844 per 100,000 for the Americas and 813 per 100,000 for Southeast Asia, for example (Norman, Bradshaw, Schneider, Pieterse, & Groenewald, 2006). In addition, self-inflicted injuries account for 9.1% of injury mortality among South Africans. Atwoli and colleagues (2013) have noted that previous studies report that more than 80% of South Africans over the age of 18 years have had trauma exposure including physical and sexual violence, witnessing violence, unexpected deaths of loved ones, and accidents. They found a 73.8% lifetime prevalence of trauma exposure among adult South Africans with an average of 4.3 potentially traumatic occurrences over their lifetimes. These rates are similar to rates reported in the United States (Atwoli et al., 2013)

While specific data on the prevalence of trauma and trauma-related injuries for children and adolescents in South Africa are not available, high levels of cumulative adverse childhood experiences such as sexual and physical abuse, exposure to domestic violence, parental AIDS-related illness, and deaths have been associated with suicidal behaviour among South

African children and adolescents, ages 10 to 18 years (Cluver et al., 2015). Poverty has also been found to be associated with both suicidal ideation and attempts (Dupere, Leventhal, & Lacourse, 2009). In addition, these traumatic experiences may exacerbate internalizing behaviours such as shame, social isolation and depression, and reduce children and adolescents' ability to cope with life stressors; thus placing them at further risk for suicidal behaviours (McKinnon et al., 2016).

The prevention and treatment of non-communicable diseases, such as mental health problems, are marginalized in South Africa (Mayosi et al., 2009). Mental health care, including treating suicidal behaviour and creating prevention programmes, is a low public health priority that receives inequitable funding, has a lack of infrastructure, has inadequate resources, and experiences shortages of mental health and psychiatric services. The problem of suicidal behaviour among adolescents, has not been high on the public health agenda, being largely overshadowed by other more numerous and pressing health problems (Schlebusch, Burrows, & Vawda, 2009).

Most of the research undertaken on suicidal behaviour is descriptive and not longitudinal (Schlebusch et al., 2009); often only examines whether the participant had suicidal ideation, made plans and/or attempts (e.g. Madu & Matla, 2003); has used small sample sizes (e.g. Vawda, 2005); and/or has used quantitative methods with assessments, measures, and instruments that may not be suitable for South African populations (e.g., Shilubane et al., 2013; Peltzer et al., 2008). Nonetheless, hospital-based studies in South Africa indicate a downward trend in the age of patients who present with suicidal attempts at government-funded hospitals. Up to one third of the reports of nonfatal suicidal behaviour are for children and adolescents (Schlebusch & Bosch, 2000; Vawda, 2005). With regards to suicidal ideation, plans and attempts among children and adolescents, studies indicate ranges from 4% to 47% for suicidal ideation, 5.9% to 18% for suicidal plans, and 5.4% to 21% for suicidal attempts (Madu & Matla, 2003; Mashego & Madu, 2009; Mayekiso & Mkhize, 1995; Peltzer et al., 2008; Shilubane et al., 2013). The wide differences in the prevalence estimates reported for adolescents' suicidal behaviour including attempts, may be due to differences in community versus hospital samples and differences between rural and urban areas (Schlebusch, 2005; 2012).

Various socio-demographic, lifestyle, and psychological factors have been identified as correlates of suicidal behaviour among South African adolescents. These include family conflict as a stressor, rigid problem-solving behaviour, over controlling parental styles and lack of tolerance by parents or caregivers for developmental/role changes (Pillay & Wassenaar, 1997), interpersonal conflict (Schlebusch & Bosch, 2000), and school-related problems such as failure and bullying (Schlebusch, 2005). Other correlates include a family history of psychopathology (including substance use), and acute and chronic stress (Schlebusch, 2005, 2012) as well as poor perceived parental support and negative feelings about the family and feelings of hopelessness (Shilubane, et al, 2013). Anger control problems, low self-esteem, perceived stress and unmet school goals (Peltzer et al., 2008) and past peer and family suicide attempts (Shilubane et al., 2012) are also associated with suicidal behaviour. Gender, too, is related to suicidal behaviour; more females have been found to attempt suicide than males (Schlebusch, 2005).

The Current Study

Despite the limitations that have been identified in previous research on suicidal behaviour among adolescents in South Africa, previous research does suggest that there is a need for a screening tool and that several socio-demographic, lifestyle, and psychological factors should be included in the tool. These factors are a lifetime history of suicidal ideation, plans and/or attempts, substance use, repeating grades, violent behaviour, contact with the criminal justice system (police), physical health concerns, a family history of suicide, knowing of peer suicidal behaviour (ideation, plans, attempts and completed suicide), depressive symptoms, hopelessness, perceived stress, anger, mastery, self-esteem, and perceived social support from family and friends. We will include these factors as risk factors to develop a screening tool that can be used by teachers in middle school settings to identify students who are high risk for suicidal behaviour. The purpose of the screening tool is to address acute risk for suicide for the referral of students to services for the determination of how serious and immediate the risk may be and how best to intervene. The screening tool will provide a mechanical approach, based upon a summing of the items scores on the tool, for teachers to assess students' risk for suicidal behaviour, which is superior to an intuitive approach to assessment, where decisions are frequently made based on a limited number and often stereotypical rather than empirically grounded indicators. The process that will be followed involves using the risk factors to develop items for the screening tool, and testing the sensitivity and specificity of the tool by examining how well the tool differentiates between students who are suicidal or not.

Method

Participants and Procedure

The study was conducted at a government run, co-educational middle school, grades 8 to 12, in a low socio-economic area in Durban, South Africa. Three schools in the Durban area were reported in the media as having had a student commit suicide in the past year. These schools were approached to participate in the study, and the first school to respond was accepted as the study site. This school served members of non-white ethnic groups, including Indian (descendants of settlers from the Indian subcontinent), Black, and Coloured (descendants of mixed White and Black ethnic origin) students who were previously discriminated against under the auspices of "apartheid" or legislated separate racial development (Burrows & LaFlamme, 2007). All grade 8 students in the school were approached to participate in the study and the majority, 221 students, agreed to be part of the study after parental consent and child assent were obtained. Students in grade 8 were selected because suicidal behaviour among students, 10 to 14 years, is relatively rare and not well researched (Kõlves & De Leo, 2014). These students were experiencing major life events that could affect their mental health including on-going developmental changes (e.g., puberty) and the transition to a high school learning environment. Participants were approached in small groups and asked to complete the socio-demographic, lifestyle and self-reported psychological or psychometric questions. Participants filled out the questionnaires individually and confidentially.

A protocol was created to assist any students who expressed distress. Distressed students were referred to the school counsellor for crisis intervention and, when needed, referred to clinical psychologists in the local area state hospitals for further assessment and intervention. Ethical approval for the study was obtained from the both the Research Ethics Committee of the University of KwaZulu-Natal and the Institutional Review Board of the University of California at Los Angeles in the United States.

Measures

The socio-demographic and lifestyle questions included questions on age, gender, students' living arrangements (e.g., *living with both parents, one parent*), any grade/s repeated, whether they ever drank alcohol, and whether they engaged in cigarette smoking. Participants were also asked if they had any knowledge of a peer's suicidal ideas, plans, attempts, or completed suicide, and if they had a family member who had committed suicide (all questions had to be answered as a *yes/no*). Participants were further asked whether they had concerns about their physical health in the past year, had ever been involved in physical fights or had contact with the criminal justice system (all questions had to be answered as a *yes/no*). The primary suicide variable of interest was personal suicidal behaviour, which was coded as whether the participant had ever thought of killing themselves, had ever made a plan to kill themselves, or made an attempt (all questions had to be answered as a *yes/no*).

Participants were asked to complete the following standardized self-report psychometric instruments: the Beck Depression Inventory (BDI), a 21-item inventory that measured depressive symptoms (Beck, Steer, & Brown, 1996); the Beck Hopelessness Scale (BHS), a 20-item scale that assessed feelings about the future and loss of motivation and expectations (Beck & Steer, 1988); the Perceived Stress Scale, a 10-item measure to determine the degree to which life situations were appraised as being stressful (Cohen, Kamarck, & Mermelstein, 1983); the Anger Scale, a 29-item scale to ascertain multiple aspects of aggression, including physical, verbal aggression, anger, and hostility (Buss & Perry, 1992); the Mastery Scale, a 7-item scale employed to determine personal control or mastery (Pearlin & Schooler, 1981); the Self-Esteem Scale, a 10-item scale used as a measure of self-esteem (Rosenberg, 1989); and the Perceived Social Support Scales (Procidano & Heller, 1983) for family (20 items) and friends (20 items) to ascertain social support.

Data Analysis

The development of the screening tool consisted of four phases. The first was to create two opposing groups, one with high suicide behaviour, and one with low suicide behaviour. These groups, 52 participants (23.53%) in the high risk group and 169 participants (76.475) in the low risk group, were created using the responses to the suicidal behaviour questions posed as part of the socio-demographic and lifestyle questions. High risk was defined as having engaged in some form of suicidal behaviour. Low risk was defined as not having engaged in any form of suicidal behaviour. Those who answered in the affirmative to any of the questions: "have you ever thought of killing yourself", "have you ever made a plan to kill yourself", or "have you ever made an attempt to kill yourself", were deemed as high risk, and the rest were deemed as low risk.

The next phase involved the identification of themes to be included in the screening tool. To locate these themes, chi-square tests were performed to assess which socio-demographic and lifestyle questions effectively differentiated between those in the high and low risk groups. Those questions where significant differences were detected were selected to be included as themes in the screening tool. This was followed by undertaking t-tests on mean scores of the low and high risk groups on the selection of psychometric instruments to identify which instruments differentiated between the high and low risk groups. Where means differed, the construct measured by that particular instrument were included as a theme in the screening tool.

The third phase was to develop the items of the screening tool, based on these themes. One item per theme, based on questions in the original questionnaire and the items from the psychometric instruments, were developed. These content and format of items were the result of a consensus decision following a list of proposed items on each theme circulated amongst the authors of this manuscript, as well as the inputs of two additional subject matter experts. Based on these inputs, a final screening tool was proposed

The final phase involved assessing the sensitivity and specificity of the screening tool. After signing off on the final screening tool, a screening tool score for each student was generated. For each of the lifestyle questions either a 1 or a 0 was allocated, 1 when the response was in line with a high suicide risk and a 0 when a response was in line with a low risk. For the items created on the basis of the psychometric instruments, a 1 or 0 was also allocated. This allocation of a 1 was based on the student's score being more than 2 standard deviations higher than the mean, or in cases where norms were available, the score indicative of severe symptoms. The assumption made here was that the teacher who completes the questionnaire would be able to identify the symptom if it was very frequent - as per 2 standard deviations above the mean or a severe diagnosis. In the cases of lower scores, a 0 was allocated. As there were twelve items, the minimum score was 0 and the maximum was 12. The sensitivity and specificity of the screening tool was then tested, to identify its ability to differentiate between those with high and low risk. This was done by testing these parameters at different score levels.

Results

The mean age of the students was 13.31 years ($SD = 0.55$). There were 115 (52.0%) boys and 106 (48.0%) girls. Of the total sample of students, 16% reported the suicide of a family member, with peer suicidal ideation reported at 26.1% and peer suicide attempts at 23.1%. A high percentage of students (65.2%) reported knowing of a peer suicide. Those students who had ever thought of killing themselves, had ever made a plan to kill themselves, or made an attempt were classified as having a high risk of committing suicide. In total 52 (23.53%) were identified as high risk and 169 (76.47%) as low risk. The results of the general lifestyle questions posed to the students indicated that 33.5% reported involvement in physical fights and 4.6% reported contact with law enforcement. Concerns about physical health were reported by almost 19%. Alcohol and cigarette use were reported by 23.4% and almost 24% of the students, respectively. These findings are presented in supplemental Table S1.

The summative results pertaining to the standardized psychometric instruments, indicated the following means for depressive symptoms (Beck Depression Inventory) M = 9.25 (*SD* = 9.05, n = 214), hopelessness (Beck Hopelessness Scale) M = 3.16 (*SD* = 3.03, n = 221), aggression and anger (Anger Scale) M = 68.57 (*SD* = 21.58, n = 220), stress (Perceived Stress Scale) M = 14.02 (*SD* = 7.30, n = 221), mastery (Mastery Scale) M = 20.60 (*SD* = 4.52, n = 220), self-esteem (Self-Esteem Scale) M = 20.87 (*SD* = 6.35, n = 218), family social support (Perceived Social Support Scale-Family) M = 12.53 (*SD* = 5.05, n = 220), and friend social support (Perceived Social Support Scale-Friends) M = 11.54 (*SD* = 4.85, n = 220).

The responses to the socio-demographic and lifestyle questions, and psychometric instruments were used to assess whether these measures could distinguish between those with low and high risk for suicide. The results are presented in Table S2. No gender differences were found between the two groups. Nor did any of the other socio-demographic items distinguish between the two groups. Four significant differences can be observed for the lifestyle questions. Those at risk for suicide had more contact with the police, had been involved in physical fights, had been more concerned about their health and reported greater alcohol use compared to those at low risk.

In Table S3, those with high and low suicidal behaviour risk were compared on their scores on the standardized psychometric instruments. Those with high suicidal behaviour risk scored higher on the Beck Depression Inventory, Beck Hopelessness Scale, Perceived Stress Scale, and Anger Scale. Those with low suicide behavioural risk scored higher on the Mastery Scale, Self-Esteem Scale and Perceived Social Support Scale-Family.

Given the differences demonstrated in Tables S3 and S4, the screening tool was developed, with one question per theme pertaining to exposure to suicidal behaviour, lifestyle and psychological characteristics which were the basis of the questions. Table S4 presents this screening tool with the twelve questions that comprise the tool. The themes underpinning each question are reflected in the first column. The questions are presented in the second column and would be asked by those administering the screen.

As indicated in the data analysis section, scores of the screening tool were then generated, based on the lifestyle questions as well as the scores on the psychometric instruments. The average score on the screening tool was 1.27 (*SD* = 1.29). To test the sensitivity, specificity and accuracy of the screening tool, several possible cut off were created, in an effort to find the optimal cut off score to use when operationalizing the screening tool. These scores needed to be whole numbers, so the first cut off score was set at 2 (approximately one-and-a-half standard deviations above the mean). To find the optimal cut off value, where sensitivity, specificity and accuracy will be optimal, cut off scores were also set at 3, 4 and 5. The results of these trail-and-error tests are presented in Table S5.

Table S5 shows that the specificity (which refers to the screening tool's ability to correctly identify those who are not at high risk for suicidal behaviour) of the test is much higher than the sensitivity (which refers to the screening tool's ability to correctly identify those who are at high risk for suicidal behaviour). Accuracy (the percentage correctly classified – either as

high or low risk) increased and plateaued as the cut off scores increased. With a cut off score of 2, sensitivity was 19% and accuracy was 80%. With a cut off score of 3, sensitivity was 52% and accuracy was 74%. With a cut off score of 4, sensitivity was at 38% and accuracy was 80%. With a cut off score of 5, sensitivity was 19% and accuracy was 80%. Thus, the cut off score of 4 yielded the best result.

Discussion

This study examined suicidal behaviour among middle school students to develop a screening tool for teachers to use to identity adolescents at risk for suicide. Although the sample consisted of young adolescents, primarily under age 14 years, over 60% indicated that they knew of a peer suicide and over 20% reported a peer had attempted suicide. These findings combined with what is known about South Africa having significant levels of suicide (Burns, 2011), underscores a need for a screening tool for suicidal behaviour among South African adolescents. Nearly a quarter of the students (23.53%) were at high risk for suicidal behaviour, reporting that they had thought of killing themselves, made a plan to kill themselves, and/or made an attempt to kill themselves. Life-style factors identified as indicating high risk for suicidal behaviour were: contact with the police, concerns about physical health, alcohol use, depressive symptoms, feelings of hopelessness, perceived stress and anger. Higher levels of mastery, self-esteem and perceived social support from family were psychological factors that discriminated those at low risk from the high risk group. These findings are consistent with previous research on lifestyle and psychological factors that are correlates of suicidal behaviour among South African young people (e.g., Peltzer et al., 2008; Schlebusch, 2005; Shilubane et al., 2013).

Our goal for developing the screening tool for suicidal behaviour was to create an instrument that can be used by teachers to distinguish those at low risk from those at high risk to improve early detection and referral into treatment. This goal is consistent with community-based health approaches to identifying those at risk for disease. For example, in community settings, the goal of health approaches, such as health screenings, is often to identify or separate those persons who have a high probability of disease for treatment from the majority of individuals who are disease free and do not need treatment (Jekel, Katz, & Elmore, 2001). The screening tool that evolved consists of twelve themes or questions that focus on whether a student, relative to other students, seems to have more police involvement, more physical health concerns, more alcohol use, more depression, more feelings of hopelessness, more stress, less mastery, and lower self-esteem, and seems angry, lacks familial support, has peers with suicidal ideation, and has a family member who committed suicide.

A strength of this screening tool is that it is based on factors identified as associated with suicidal behaviour from local research on South African adolescents. Further, research on child and adolescent mental disorders represents a small fraction of the 3% to 6 % of mental health research conducted globally in low and middle income countries (Patel, Flisher, Nikapota, & Malhotra, 2008). This study is an important beginning to expand the scope of research on adolescent mental health, particularly suicidal behaviour, in South Africa.

This research also demonstrates that suicide risk is prevalent among some South African adolescents, in this instance, middle school students. The development of a screening tool to determine who is at risk for suicide is warranted. Given that human resources for mental health care are limited in South Africa, the use of a screening tool for suicidal behaviour by teachers in schools is an appropriate first step in the development of suicide prevention programmes for adolescents. A national survey indicated that, per 100,000 people, the country has only 0.28 psychiatrists, 0.32 psychologists, 0.40 social workers, 0.13 occupational therapists and 10 nurses (Burns, 2011). International prevention programmes for suicide among young people call for early intervention and assessment services, including suicide screening, that are integrated within school systems, educational institutions, juvenile justice systems, substance abuse programmes and mental health programmes (Pena & Ciane, 2006). South African prevention and intervention strategies to address suicidal behaviour need to be created from findings derived from South African research rather than simply transplanting knowledge about suicide prevention from international programmes that may not be applicable within a South African context (Burrows & Schlebusch, 2009).

There are some limitations in this study. The sensitivity of screening tool is relatively low, which could be due to the use of broad or distal suicide risk questions to determine risk. The questions may also need further refinement and the use of Likert-type responses versus the yes/no responses may be useful to improve sensitivity. Further research to increase the sensitivity of the tool is necessary. Racial/ethnic variation in the utility of the tool could not be addressed. Students was not asked about their race/ethnicity as this was considered to be a very sensitive area that could not be queried about when the data were collected (which was relatively close to ending of apartheid). Data on the race/ethnicity of participants should be collected in future research using the screening tool. Students from white ethnic groups were not included in the sample, since there were none enrolled at the school study site, and this may limit the generalizability and use of the screening tool for all young people in South Africa.

While additional research remains to be done to fully validate this screening tool, such as establishing positive predictive value (PPV) in school settings, testing the implementation of this tool in a school setting with teachers should be considered as an important initial step in the validation process. The refinement of this screening tool could be the first phase in the development of a comprehensive suicide screening and prevention programme for school age young people in South Africa.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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