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RESEARCH ARTICLE

Prevalence of Depression Symptoms amongst Orphaned Adolescents at Secondary Schools in Townships of South Africa

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Abstract:

Introduction:

Depression among orphans is a matter of concern due to its impairing effect on functioning and emotions. This study determined the prevalence of depression symptoms and the extent of emotional and functional problems among orphaned adolescents in secondary schools.

Methods:

A cross-sectional descriptive observational design using a Children's Depression Inventory 2 (CDI 2) test was conducted. The CDI 2 was used to measure the prevalence of depression symptoms among 301 orphaned adolescents. The CDI 2 T-scores of more than 65 indicated the presence of depression symptoms. Among 301 participants aged between 13 and 17 years old, 176 (58.4%) were females, 61% (n = 184) were double orphans, and 39% (n = 117) were maternal orphans.

Results:

The prevalence of depression symptoms was 21%, with 63 (20.9%) having elevated emotional problems, 77 (25.5%), elevated functional problems, 9.9% (n=30) very low self-esteem and 90% (n = 271) no self-esteem problems. Elevated negative mood was 20.6% (n = 26), 14.6% (n = 44) had an elevated level of ineffectiveness and 32.5% (n = 98) had elevated interpersonal problems.

Conclusion:

The results of this study preclude any conclusions about the comparison of common characteristics between orphaned and non-orphaned adolescents. The standardised tool used narrowed the number of participants of interest due to the cut-off age.

Keywords: Depression symptom, Orphaned adolescent, Functional problems, Emotional problems, Non-orphaned adolescents, Maternal orphans.

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1. INTRODUCTION

For young people, mental health disorders are a foremost cause of the health-related burden, accounting for 15–30% of the Disability-Adjusted Life-Years (DALYs) lost during the first three decades of life [1, 2]. Worldwide there are estimated 143 million orphans, with nearly about 132 million living in Low and Middle-Income Countries (LMICs) [3]. The failure to address psychiatric problems in children and adolescents in low-resource settings is a public health concern with wide-reaching consequences that impedes the accomplishment of basic development goals in Low and Middle-Income Countries (LMICs) [4, 5]. Furthermore, research has revealed that a large proportion of psychiatric problems in adults originate during the early stages of life [5 - 7]. This necessitates the early identification of mental health problems and precipitating factors among vulnerable adolescents in order to find ways to address the problem [8, 9].

Studies have shown that the loss of a mother or both parents is associated with depressive symptoms [10, 11]. Major depression results in a depressed mood, social withdrawal, loss of interest in age-related pleasurable activities, feelings of hopelessness, a poor self-concept, a poor concentration span, and poor performance at school, as well as appetite and sleep disturbances [7, 12 - 14]. Depression, therefore negatively

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impacts the orphaned child's development and performance in areas of functioning, such as forming and maintaining relationships with people, flourishing at school, efficiency in performing tasks, emotional problems and other such areas.

Studies conducted among orphans in Ethiopia reported a depression prevalence of 24.1% and 36.4%, respectively [13, 14]. Additionally, the prevalence of depression symptoms was slightly higher among females (27.2%) than among males (21.2%) [14]. In these studies, depression was found to be associated with having five or more siblings, age, sex, suicidal ideation, medical illness, the orphaned status, and exposure to physical abuse [8, 15 - 17].

In a study to determine the severity of depression symptoms among orphaned children and adolescents, most of the adolescents had mild, minimal or no or depression symptoms, with very few having moderate-to-severe levels of depression symptoms [18]. Orphans who were aged 14 years and younger had severe depression symptoms [18], and orphaned adolescents had lower self-esteem and higher depression levels than the adolescents who were living with their parents [19].

There is a paucity of research on the prevalence of depression symptoms and levels of emotional and functional problems among orphans in South Africa. Most studies conducted in South Africa focus only on AIDS orphans and adolescents living with HIV in a particular area [20, 21]. The extensive focus on the mental health of AIDS affected adolescents excludes other adolescents and does not give a clear picture of the prevalence of depression among the maternal orphan adolescent population in the South African context. The objective of the current study was to determine the prevalence and the extent of depression symptoms among orphaned adolescents in Tshwane North of Gauteng Province in South Africa.

2. METHODS

2.1. Design and Setting of the Study

A cross-sectional, descriptive observational design was employed to determine the prevalence and extent of emotional and functional symptoms of depression among orphaned adolescents. This paper presents the data on the prevalence of depression, using the standardised Children's Depression Inventory (CDI tool). The setting of the study was four randomly selected secondary schools in Tshwane North District of Gauteng Province, in South Africa. Tshwane North District is predominantly an urban township area with some places being semi-rural.

2.2. Sampling Technique and Size

The study population was non-institutionalised orphaned adolescents who were attending high schools in Tshwane North District. Both male and female orphans between 13 and 17 years old, and those who had lost either a mother or both parents, were included in the study. The study sample size was 301. A multi-staged sampling technique was employed for the inclusion of the participants into the study. The population size of orphaned adolescents in the eight schools in Tshwane North was N=1280 as reported in the Gauteng Department of Education records [20]. Of the eight (N=8) secondary schools in the district, a random selection of four (N =4) schools was included. A census of all identified orphans (N=301) in the four schools, who had agreed and given written assent, and those whose guardians had given written informed consent, were included in the study. The total number of orphans in the four schools who were eligible and approached was 317. From the 317, eleven of them did not return informed consent forms from their guardians. Five potential participants had no interest in participating; as a result, they were not included in the study.

2.3. Participant Recruitment and Data Collection

The researcher obtained lists of orphans from the orphan statistics records at the schools. From the orphan statistics records of the schools, a sampling frame was developed by extracting potential participants that met the inclusion criteria for the quantitative aspect of the study. In the two schools that did not keep records of orphans, the researchers identified orphaned children by administering the socio-demographic part of the tool to all children in all classes of the school with the assistance of the teacher. The socio-demographic form was self-administered, and data from the forms were used to identify maternal and double orphans who met the quantitative inclusion criteria. Identifying potential study participants in this manner allowed them the confidentiality of their personal information, as some learners do not wish to reveal their orphan status to fellow learners at school.

Identified potential study participants were recruited in a separate private room. When recruiting the study participants, details about the study and the purpose of the study were explained. Potential study participants were given an opportunity to ask questions or for any clarification regarding the study. All the participants were recruited from public schools.

Data collection occurred after school to avoid interruption of the school activities. Once ethical clearance, permissions, guardian consent and assent had been granted, the grade teachers were requested to refer learners who were orphaned adolescents to the researcher. The participants were placed in one classroom, which was a waiting area for data collection. The participants were then called into the other classroom in groups of six, were seated individually and apart from one another to allow for privacy and the freedom necessary to enable the completion of the form without anyone else looking at their responses. The seating arrangement was meant to minimise the propensity of participants to select socially desirable responses, which can occur when the participant has no privacy while completing such a self-report form. Each participant was given a hard copy of the CDI self-report form.

The researcher explained the self-report test and how to complete the form and allowed the participants to complete the forms. The data collection tools for this study were a standardised CDI 2 self-report test by Maria Kovacs [20] and a survey questionnaire containing socio-demographic questions. The tools were administered in English as this is the medium of communication in the schools. The Children's Depression Inventory is a self-report test consisting of 28 items; its purpose

is to detect the symptoms of a major depressive disorder in children and adolescents. The CDI self-report test has two subscales assessing emotional and functional problems. In addition, the scales on emotional problems are sub-divided into negative mood/physical symptoms and negative self-esteem. The scales on the functional problems are sub-divided into ineffectiveness and interpersonal problems. The subscales on the emotional problems assess distressed feelings such as irritability, sadness and guilt, sleep, appetite, suicidality, energy, motivation, self-esteem and perception of the self. The subscales on the functional problems assess memory, relationship with peers, social ability and interest in pleasurable activities. Each test item has three statements, graded from 0-2. The study employed the total sum score of 56, with a cut-off raw score of 20, which is applicable for a non-clinical setting as in our current study [21, 22]. A test sum/raw score of 20 and above therefore indicated the presence of depression symptoms, with the severity increasing as the sum score increased [20]. Raw scores of 20 and above fall within the category of more than 65 total T-scores when converted using the test scoring guide [20]. The test scoring guide shows that Total T-scores of more than 65, indicate the presence of depression symptoms [20].

The tool is used internationally and has been used by other researchers in other developing countries. The socio-demographic questionnaire was a brief researcher-administered survey, which contained questions on the following: age, gender, school grade, father alive, number of adults in the household, number of siblings, number of other children in the household, and relationship to children in the household.

2.4. Data Analysis

Raw data from the CDI 2 test forms completed manually by the participants were captured in the Multi-Health Systems Assessment Software (MHSAS). The software produced a report with a total of the raw scores per test subscale as well as the corresponding total T-scores. Using the CDI test scoring guide, the total T-scores of the test subscales were used to classify the subscales accordingly into the following categories: average, high average, elevated and very elevated. The outputs of the MHSAS were captured onto a Microsoft Excel sheet and the classifications were coded, preparing for data analysis. The test results produced by the MHSAS with a total T-score of 64 and lower produced a report stating "no problems identified". A total T-score of 65 or higher indicates that the child is experiencing an elevated number of depression symptoms and/or that the child is observed by teachers and parents as showing definite depression symptoms [20]. Subsequently, total T-scores of 64 and lower (the high average, average and lower range) indicate the absence of depression symptoms, according to the test interpretation guide [20]. Total T-scores of 64 and lower were coded zero, indicating the absence of depression symptoms. In addition, total T-scores of 65 and higher (the elevated and very elevated range) were coded one, indicating the presence of depression symptoms. In this study, we dichotomised the total T-scores to 64 and below (high average, average and lower range) and 65 and above (the elevated and very elevated range). Univariate statistical analyses were performed using the STATA 10 version to determine the frequencies and percentages of the socio-demographic variables and the depression variables.

2.5. Reliability and Validity

The CDI is a standardised tool that has been used internationally, including in a developing country such as Tanzania [9, 23 - 25]. The constructs of the CDI have high internal consistency, meaning that the tool produces stable and consistent results [26]. The researcher, therefore, ensured reliability by adhering to the standard procedures of administering the test. The CDI has excellent psychometric properties, and it measures depression in children and adolescents accurately and reliably when used properly [27].

English is a medium of instruction in the study context. As a result, the self-report test was piloted in English, and it was found that the participants could understand the test language. Only two items of the test were not understood by the majority of the participants during the pilot phase. The researcher explained the two items to all participants before the self-administration of the test to ensure that it produced reliable results.

Table **1** shows that the alpha estimate for the CDI was 0.754. While this is slightly lower than the average estimate of reliability found by the instrument's author (0.80), it still falls within an acceptable range when employing a community-based sample [28]. Internal consistency reliability estimates for the four subscales of the CDI ranged from 0.672-0.738, comparable to those for the original English CDI (ranging from 0.59 to 0.68) [20, 29]. The test subscales in this study have shown to be reliable indicators. A summary of the Cronbach alpha coefficients for the total CDI and subscales is provided in Table **1**.

Table 1. Cronbach's alpha coefficients.

Scale	Cronbach's Alpha
CDI total	0.754
Subscale 1: Negative Mood	0.738
Subscale 5: Negative Self-Esteem	0.689
Subscale 3: Ineffectiveness	0.672
Subscale 2: Interpersonal Problems	0.684

Note: CDI: Children's Depression Inventory.

Table **2** illustrates the correlation coefficients between the subscales of the CDI and all correlations were statistically significant (p>0.00). Negative mood had the highest correlation with the total scale, with a correlation coefficient of 1.000, followed by ineffectiveness at 0.488, interpersonal problems at 0.458, and negative self-esteem at 0.395.

Table 2. The correlation coefficients between the subscales of the CDI.

Subscale Total	R=CDI	*p*
Subscale 1: negative Mood	1.000	ref
Subscale 2: Negative Self-Esteem	0.395	0.000
Subscale 3: Ineffectiveness	0.488	0.000
Subscale 4: Interpersonal Problems	0.458	0.000

2.6. Ethical Considerations

Ethical approval of the study was obtained from the Sefako Makgatho Health Sciences University Research Ethics Committee (SMUREC/H/241/2017: PG). Permission to conduct the study at the schools was obtained from the Gauteng Department of Education and from the relevant school principals. Assent was obtained from the participants and written informed consent was obtained from the guardians. Even though the tool was administered in English, the informed consent was administered in a language that the participants and the guardians preferred as a way of creating rapport with the participants. Confidentiality and privacy were ensured during recruitment and data collection by conducting the process in a private room. Participants who were identified as being suicidal according to their CDI-2 test form or as experiencing significant symptoms of depression were referred to the school health psychologist in writing. The participants were provided with lunch and cash for transport as a token of appreciation for staying behind after school and for participating in the study.

3. RESULTS

A sample of 301 non-institutionalised adolescents in high school in the Tshwane North District participated in this study. Of the 301 participants, 125 (41.5%) were males and 176 (58.4%) were females. They were aged between 13 and 17 years old. The average age of the participants was 16.1 years. More than half (61%; n = 184) of the study sample were double orphans and 39% (n = 117) were maternal orphans. In addition, 160 (53.1%) reported that their caregivers were unemployed, while 141 reported that their caregivers were employed. Of the 160 caregivers that were reported to be unemployed, the majority (62.66%; n = 99) depended on old age social grants as their source of income, while 19.62% (n =31) depended on the child support grant, and 17.72% (n = 28) depended on assistance from their family members. Furthermore 23.9% (n = 33) caregivers were formally employed, while 76.1% (n = 108) were in informal employment. Caregiver employment was classified into two categories, which were formal and informal employment. Formal employment included permanent professional employment such as police officer, nurse, teacher, etc. Informal employment included part-time unregistered employment such as domestic worker, waiter and waitress, retail worker, hawker, skilled manual labourer, etc. The prevalence of depression symptoms in this study was 21%. Of the 301 participants, only 21% (n = 64) had depression symptoms (Table **3**).

3.1. Estimates of Reliability

Table **4** below shows that the minimum total T-score of all the 301 participants was 38 and the maximum was 89. The mean total T-score was 56.166 at a standard deviation of 10.791. This shows that most study participants had no depression symptoms, with their total T-scores ranging between the average and lower range according to the CDI 2 classification.

Furthermore, Table **4** shows that of the 301 participants, 20.9% (n = 63) had elevated emotional problems while the majority 79.1% (n =238), were within the average-to-low level, which shows that they had no emotional problems. Similarly, most of the study participants 74.4% (n = 224) had no functional problems while 25.5% (n = 77) had elevated functional problems.

Table 3. Socio-demographic data of orphaned adolescents in high school.

Characteristics	*n* (%)
Gender	-
Male Female	125 (41.5) 176 (58.4)
Age Mean(SD);Range	16.15 (1.07)13-17
Orphan Type *(n=301)*	-
Double orphan Maternal orphan	184 (61) 117 (39)
Social grant status (*n=301)*	-
Not on social grant Receiving social grant	119 (39.5) 182 (60.5)
Type of Social Grant	-
Child support grant Foster care grant	59 (31.2) 130 (68.8)
School Grade (*n=301)*	-
Junior secondary Senior secondary	64 (21.3) 237 (78.7)
Primary Caregiver (*n*=301)	-
Grandmother Aunt/uncle/cousin (extended family) Father, brother/sister, legal guardian Self Neighbor	139 (46) 76 (25.2) 84 (27.1) 1 (0.33) 1 (0.33)
Caregiver Employment Status (*n*=301)	-
No Yes	160 (53.2) 141 (46.8)
Type of Caregiver's Employment (*n*=141*)*	-
Informal employment Formal employment	108 (76.1) 33 (23.9)
If No, What is Your Caregiver's Source of Income (*n* =158)	-
Old age social grant Child support grant Assistance from family member	99 (62.7) 31 (19.6) 28 (17.7)

Table 4. Counts and percentages of participants in category levels of emotional and functional symptoms of depression (*n=301)*.

Variable	*n (%)*
Total-T scores[a]	**56.17 (10.79)**
Emotional Symptoms of Depression	-
Elevated to very elevated level High average to low level (no symptoms)	63 (20.9) 238 (79.1) **Mean (SD); range** 55.54 (11.16);33-99
Functional Symptoms of Depression	-
Elevated to very elevated High average to low level (no symptoms)	77 (25.6) 224 (74.4) **Mean (SD); range** 55.70 (12.00); 7-90

*High average to low category determined by combining the counts of subtest T-scores that were 64 and below (shows no depression symptom according to the test interpretation guide). Elevated to the very elevated category determined by combining the counts of subtest T-scores that were 65 and above (shows significant depression symptoms according to the test interpretation guide).

Table **5** shows that 9.9% (n = 30) had very low self-esteem while most of the participants (90%; n = 271) had no self-esteem problem. In addition, 20.6% (n = 26) had elevated negative mood problems and 79.4% (n = 239) had no mood problems. Most of the participants in the study (85.3%; n = 257) were effective in performing their daily tasks, while 14.6% (n = 44) had an elevated level of ineffectiveness in performing daily tasks. In addition, 32.5% (n = 98) had elevated interpersonal problems and 203 (67.4%) had no interpersonal problems.

Table 5. Results of subtests of emotional and functional scales (*n*=301)

Variable	*n (%)*
Emotional Symptoms	-
Negative Self-esteem Elevated to very elevated (very low self-esteem) High average to low level (no symptoms)	30 (10.0) 271 (90.0)
Negative Mood Elevated to very elevated High average to low level (no symptoms)	62 (20.6) 239 (79.4) **Mean(SD);range** 55.54 (11.16);33-99
Functional Symptoms Ineffectiveness	-
Elevated to very elevated High average to low level (no symptoms)	44 (14.6) 257 (85.4)
Interpersonal Problems Elevated to very elevated High average to low level (no symptoms)	98 (32.6) 203 (67.4) **Mean (SD); range** 55.70 (12.00); 7-90

4. DISCUSSION

This study was conducted among a sample of 301 maternal and double orphaned adolescents who were not institutionalised and of ages between 13 and 17 years. The sample was drawn from learners in selected secondary schools in the Tshwane North District of Gauteng Province.

The prevalence of depression symptoms (21%) in this study is within the range of prevalence among maternal orphans in other studies, where the rates ranged between 21% and 24.1% [9]. The literature also shows that the prevalence of depression symptoms in our study is low in comparison with the prevalence rates reported in studies among the same population in Nairobi (50.4%) and Ethiopia (36.4%) [13, 30]. The lesser prevalence rate in this study, as compared to the prevalence rate in a study conducted in Nairobi, could be a result of the fact that the participants in this study were raised in families, while most participants in the Nairobi study had a history of having experienced abuse and had been institutionalised for longer periods [30].

In addition, the reason for the lesser prevalence of depression symptoms in this study than in the study in Ethiopia could be that the participants in our study had better social support than the participants in the study conducted in Ethiopia. More than half (60.47%; n = 182) of the participants in this study were receiving social grants and living in families in their communities, and close to half (46.84%; n = 141) of them had caregivers who were employed. The participants in the study conducted in Ethiopia had experienced a high level of community discrimination and a low level of social support and had been institutionalised from younger ages [13].

On the other hand, the prevalence of depression symptoms among the participants in this study was higher than the prevalence rate in similar studies which were conducted in Canada at 11%, Bangladesh at 15%, and the United States of America (USA) at 5.7% [15, 31, 32]. The differences in the societal and cultural contexts of South African children and those in the countries referred to above could be the reason for yielding different results when administering standardised tools in these settings [13]. In addition, Canada and the United States of America (USA) being developed countries, the orphaned adolescent population in this context is most probably surrounded by adequate support networks and resource availability for their needs, and hence the lower depression prevalence there than in our study.

In this study, depression symptoms were screened using the CDI 2 test, which has functional and emotional constructs. The study revealed that of the 301 participants, 63 (20.93%) had elevated emotional problems, particularly negative mood problems. The percentage of study participants that had emotional problems in this study is lower than those in other studies conducted among orphans, which were 49%, 56% and 40.35% respectively [33 - 35]. The lower percentage of emotional problems in this study could be explained, as said before, by the fact that the orphans who participated in this study were raised in a family context and had better social support than the participants in the other three studies, who were institutionalised and deprived of a secure family environment [36, 37]. There is a dearth of literature that quantifies the levels of emotional and functional problems among non-institutionalised orphans in Africa, so we are unable effectively to discuss these results in relation to the results of similar studies among similar study populations in the African context.

Furthermore, of the 301 participants in the study, 77 (25.58%) had elevated functional problems. Poor functioning amongst vulnerable children has been associated with the caregiver's not being the biological parent [38, 39]. In this study, approximately 72% of the participants, which is the majority, were raised by grandmothers or other members of the extended family. The small number of participants that presented with elevated functional problems in this study is a possible indication of resilience among this group of adolescents. Other studies have confirmed that some orphaned adolescents are resilient to their circumstances [40 - 42]. It is, however, important to address those functional problems. An evidence-based whole-school approach that encourages interaction with peers through structured play activities might enhance the establishment of relationships, spending time with peers at school, and consequently reducing the social withdrawal and interpersonal symptoms of depression.

The majority (79%; n = 237) of the participants in this study were within the high average to low level class on all the subscales of the test, which means they had no depression symptoms according to the CDI 2 interpretation guide. Few

(21%; n = 64) were within the elevated to the very elevated range. These findings concur with the findings of a study that revealed that most orphaned adolescents had mild to no depression symptoms, while severe depression was prevalent (78.2%) among children below 14 years of age [17]. A number of studies have confirmed that older adolescents are more resilient than younger ones [43 - 46]. The functional symptom of interpersonal problems was the most prevalent at 32.5% (n = 98), followed by the emotional symptom, negative mood 20.6% (n = 62). Children who are depressed are more often withdrawn from others and so may acquire insufficient interpersonal skills [47]. Their disturbed emotions can strain relationships with their guardians, educators and fellow orphans who may not be aware that they are depressed [47]. There is a paucity of similar studies that have reported on the most prevalent depression symptoms among orphaned adolescents, so it is not possible to discuss these results in comparison with those of other studies. Orphaned adolescents need to be empowered with skills, knowledge and access to social support networks. Being empowered with skills while interacting with peers is most likely to benefit orphaned adolescents by improving their positive feelings of self-worth and reducing their emotional symptoms of depression. The evidence-based skills training could include self-awareness, human rights, HIV and AIDS, reproductive health, nutrition, planning for the future, saving money, accessing financial institutions, job readiness, and the basic principles of starting a business [47 - 50].

4.1. Limitations

The findings of this study must be interpreted, taking some limitations into consideration. The study investigated only orphaned adolescents and excluded the non-orphans. Hence, the characteristics and the symptoms of depression among orphans could not be compared with those of non-orphaned adolescents. Future studies should therefore have a reference population from which the non-orphan scores can be compared against scores of the orphaned population. A linear correlation of age and orphan type was not calculated. This is because the age gap of the study participants was narrow, with the study focussing only on high school learners and the test having a cut-off age of 17. Also, study participants were predominantly double orphans; as a result a linear correlation of maternal versus double orphans. The CDI 2 with its cut-off age of 17 does not cater for the screening of the majority of high school learners in the African context, who are predominantly above the age of 17 years, due to the limited support they receive and their consequent repeating of school grades. Depression test authors should consider making provision for the older age of some school-going vulnerable children when designing the tests.

CONCLUSION

Considering the functional and emotional impairment that can result from depression, as well as the possibility of the condition continuing into adulthood, the depression prevalence of 21% in this study is high. This finding suggests the need for school-based depression screening and relevant mental health promotion interventions through the current Department of Education's school-based support team.

IMPLICATION FOR MENTAL HEALTH IN SOUTH AFRICA

Screening for depression symptoms in schools would establish the incidence of mental ill-health among school-going children in South Africa and inform the necessary intervention programmes.

AUTHORS' CONTRIBUTION

Conceptualization, M.M.M; investigation T.V.K; Methodology, M.M.M; data validation, T.V.K; formal analysis, T.V.K; writing original draft preparation, T.V.K; writing review, M.M.M; Supervision; M.M.M; Project administration, T.V.K; Funding acquisition T.V.K.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval of the study was obtained from the Sefako Makgatho Health Sciences University Research Ethics Committee (SMUREC/H/241/2017: PG). Permission to conduct the study at the schools was obtained from the Gauteng Department of Education and from the relevant school principals.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

Assent was obtained from the participants and written informed consent was obtained from the guardians.

AVAILABILITY OF DATA AND MATERIALS

The data used to support the findings of this study are available from the corresponding author upon request.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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