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ORIGINAL PAPER

Mental health problems and their association to violence and maltreatment in a nationally representative sample of Tanzanian secondary school students

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Abstract

Purpose Little is known about the prevalence of mental health problems among adolescents in Sub-Saharan Africa. Research consistently determined violence and maltreatment to be important risk factors. In this study, we examined the prevalence of mental health problems among adolescents in Tanzania, as well as the association with exposure to violence and maltreatment.

Methods We administered a set of questionnaires (e.g., strength and difficulties questionnaire; conflict tactic scale) to a nationally representative sample of 700 Tanzanian secondary school children (52% girls; age 14.92 years, SD = 1.02) and 333 parents or primary caregivers (53% females; age 43.47 years, SD = 9.02).

Results 41% of the students reported an elevated level of mental health problems (emotional problems 40%, peer problems 63%, conduct problems 45%, hyperactivity 17%) in the past 6 months. Concordantly, 31% of parents reported observing an elevated level of mental health problems in their children (emotional problems 37%, peer problems 54%, conduct problems 35%, hyperactivity 17%). After controlling for other risk factors, we found significant associations between physical violence by parents and adolescent's mental health problems reported by students ($\beta = 0.15$) and their parents ($\beta = 0.33$).

Conclusions Our findings suggest a high prevalence of mental health problems using screening tools among secondary school students in Tanzania as well as an association between physical violence by parents and adolescents' mental health problems. Our findings emphasize the need to inform the population at large about the potentially adverse consequences associated with violence against children and adolescents.

Keywords Mental health · Violence · Maltreatment · Prevalence · Tanzania · Sub-Saharan Africa

Background

Mental health problems among children and adolescents in low-income countries

Mental health problems are the leading cause of behavioral adjustment difficulties among children worldwide [1, 2]. Mental health problems can result in a child being unable to successfully perform mental functions, possibly resulting in reduced productivity, reduced success in developing fulfilling relationships with others, and an inability to change or cope with adversity [3]. Approximately 10–20% of the world's children and adolescents experience mental health problems each year [4–7]. However, most of the findings on the prevalence have been reported for high-income countries [8, 9].

The few studies available indicate that mental health problems in children across low and middle-income countries are prevalent. For example, a study by Patel et al. [4] indicated that mental health problems were common in 27% of minors in Brazil, 18% in Ethiopia, and15% in South Africa. From Sub-Saharan Africa, a meta-analysis of ten studies with a sample of 9713 children from 5 countries indicated that one in seven children and adolescents reported

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significant mental health difficulties, with one in ten children having a specific psychiatric disorder [10].

In Tanzania, studies by Hermenau et al. [11, 12] reported depressive symptoms, posttraumatic stress symptoms, and aggressive behaviors in orphaned children. Moreover, Hecker et al. [13, 14] found internalizing and externalizing problems in a sample of primary school children. Studies from secondary school children [15, 16] also indicated prevalence of delinquent behavior, aggression and, conduct problems. However, these findings are based on at-risk or non-representative samples, and there is to date no nationally representative prevalance data of mental health problems of children available.

Risk factors for mental health problems of children and adolescents

Research findings worldwide have linked mental health problems in children and adolescents with different risk factors inside and outside the family [17, 18]. However, a large body of literature, mostly from high income countries, indicated maltreatment by parents or caregivers as one of the main predictors of mental health problems in children [19–21]. Studies emphasized that maltreatment and violence are associated with aggression, conduct disorder, anxiety disorders, and depression [21, 22]. For example, exposure to physical violence was highly associated with externalizing behavior outcomes both in toddlerhood and in later ages [19]. Furthermore, Weaver et al. [23] added that experiencing physical violence by age 10 predicted violent behavior and delinquency in adolescence ages.

In Sub-Saharan Africa, studies from Burkina Faso [24] and from Uganda [25] found a significant relation between mental health problems and parental violence in school-aged children. In Tanzania, studies by Hermenau et al. [12, 26] reported that physical and emotional violence in orphaned children was associated with mental ill-health and aggressive behavior problems. Moreover, Hecker et al. [13, 14] reported strong associations between harsh discipline, internalizing problems and externalizing problems in school children. However, all these findings are based on at-risk or non-representative samples.

There is also no doubt that also other factors contribute to the development of mental health problems in children, including biological, familial or social factors. For example, peer violence has strong associations with different mental health problems in minors [27]. Moreover, children's age and gender seem also to contribute to the degree of mental health problems in minors [28]. Additionally, parental age and gender are reported in different studies to be associated with behavior problems in children [29]. Furthermore, other studies reported strong associations between parental stress, household income, and other familial factors to mental health problems of children [17, 30].

Objectives

In this study, we assessed Tanzanian secondary school students and their parents in a nationally representative sample. Our first aim was to examine the prevalence of mental health problems of secondary school students in Tanzania. We expected a high prevalance of mental health problems (i.e., conduct problems, hyperactivity, emotional symptoms, and peer problems) among Tanzanian secondary school students.

Our second aim was to investigate the association between violence and maltreatment by parents and mental health problems of adolescents. We hypothesized that violence by parents would be associated with adolescents' mental health problems. We controlled for other potential influential factors, including personal and family factors, and violence outside of the family.

Methods

Design and sampling

The study included 6 (of 25) regions in Tanzania. Five regions were selected randomly. Additionally, the largest city of the country, Dar es Salaam, was intentionally selected. In each region one mixed-day secondary school from the regional capital was randomly selected. Similarly, one rural district was randomly selected from which a single mixed-day secondary school was also randomly selected. In Dar es Salaam, one of the cities' municipals was randomly chosen, from which one mixed-day secondary school was selected at random. Within each selected school, 120 students in the 8th and 9th year of formal schooling were stratified by gender and then randomly selected.

Procedure

The study has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. The University of Dar es Salaam on behalf of Tanzanian Commission for Science and Technology and the Ethical Review Board of the University of Konstanz approved the study. Only parents who gave their informed consent in written form and adolescents with written parental informed consent and who freely provided assent themselves were included in this study. Prior to data collection, a letter explaining the study's aims and procedures was sent together with an informed consent form to the parents or caregivers to seek parental consent. In total, 63% of the forms were returned. Students filled out questionnaires

in groups of 3–5 on the school grounds under supervision of a research assistant. The completion of questionnaires took an average of 45 min.

The parents were contacted through letters and phone calls. Of the 700 parents contacted in all schools, 333 (48%) parents were willing and able to participate. Parents were invited to come to the respective schools. They were asked to sign an informed consent document and each parent filled out the questionnaire in a one-on-one interview setting within an average completion time of 30 min. A compensation of approximately three USD was given to each attending parent.

Participants

A total sample of 700 students participated in the study (see Table 1). In total, 54% ($n=376$) of the students lived with both parents, 28% ($n=197$) with one parent, 18% ($n=124$) with other relatives and/or in other facilities. The 333 participating parents or primary caregivers had a mean of 7.69 years (SD = 2.66) of formal education. Parent or caregiver types of employment ranged from formal 13% ($n=42$), non-formal but reliable 33% ($n=110$), non-formal and unreliable 44% ($n=146$) to no employment 10% ($n=35$). The majority of parents reported a low monthly household income pursuant to the government analysis of monthly household income for Tanzanian families which was around 25 USD as per year 2001 to 2007 [31].

Measures

Following established international guidelines [32] all instruments were translated into Swahili and back translated to English in a blind written form. The first part of the questionnaire gathered demographic information, such as age, gender, and living conditions of students and parents, respectively.

Exposure to violence

Students' experiences of violent punishment both at home and at school in the year preceding the investigation were assessed with items from the parent–child version of the Conflict Tactics Scale (CTSPC) [33] which were filled out by both students and parents. For the purpose of the present study, participating students completed this questionnaire twice: first referring to violence and neglect they experienced from their parents or caregivers and second referring to the violence by teachers. Parents filled out in respect to violence they apply to their participating child. The items of the scales are rated on seven answer categories from "never" (0) to "more than 20 times" (25) and are then summed up to one score per subscale. The CTSPC comes with low to moderate psychometric properties for the two subscales of interest, indicating Cronbach's alpha coefficients of $\alpha=0.55$ for physical violence and $\alpha=0.60$ for emotional violence. The mangling alpha reliability can be explained by the fact that the items of the scale measure rather rare events, and that the correlation between items, which is the basis of alpha, are low due to extreme skewness [33]. Nonetheless, CTSPC has been used worldwide and its validity has been underscored by numerous studies [34].

In addition, we assessed peer violence using three items of the Maltreatment and Abuse Chronology of Exposure [35]. The items in this sections were: *Has any peer in your whole life ever …* (1) "*called you names or said hurtful things more than a few times a year?*", …(2) "*said things behind your back, posted derogatory messages about you, or*

Table 1 Descriptive statistics

	Students' self-report ($N=700$)		Report of parents ($N=333$)	
	M or *n*	SD or %	*M* or *n*	SD or %
Age	14.92	1.02	43.47	9.02
Gender (Male)	335	48	155	47
Both parents alive	556	79	–	–
Peer violence (at least once in lifetime)	449	64	–	–
Emotional violence by teachers	20.46	21.16	–	–
Physical violence by teachers	31.24	30.82	–	–
Emotional violence by parents	21.71	21.20	26.59	20.30
Physical violence by parents	23.10	30.39	18.89	20.79
Neglect by parents	11.48	15.05	10.72	14.29
Parental stress	–	–	9.23	4.43
Household income per month (< 100 US $)	–	–	215	65

M mean, SD standard deviation, *N* total number of respondents, % percentage, *n* number of responses in a particular category

spread rumors about you?", …(3) "*hit you so hard or intentionally harmed you in such a way that you were injured?*" These items were answered in two categories which are Yes (1) or No (0).

Adolescents' mental health

Adolescents' mental health problems were assessed using the Strengths and Difficulties Questionnaire (SDQ) [36] for parents and the SDQ self-report version for children. The SDQ consists of five subscales of five items each, which are answered in three categories from "not true" (0), "somehow true" (1) to "certainly true" (2). The sum of all items except the ones from the prosocial behavior subscale represents a total difficulty score (SDQ score; range 0–40). Values of 17 or higher on the SDQ score indicate severely elevated levels of mental health problems [37]. Cut-off values for the four subscales of interest can be found in Table 2. The SDQ comes with good psychometric properties (SDQ score: $\alpha = 0.83$) and has been repeatedly used in different countries [37], including Tanzania [12, 26].

Data analysis

To test the hypothesis that violence and neglect by parents are associated with mental health problems among adolescents, hierarchical multiple regression analysis was carried out. Preliminary analyses confirmed the tenability of all assumptions for linear regression models. Missing values made up 0.07% ($n = 26$) of the children's data and 0.01% ($n = 2$) of the parents' data, and were deleted listwise. The assumption of normal distribution of the residuals of the dependent variable following West, Finch, and Curran [38] could be uphold in both samples. Multicollinearity between predictor variables could be ruled out. No outliers were detected. Linearity, homoscedasticity, and independence of residuals were tenable. Effect sizes were calculated using Cohen's f^2, with $f^2 \geq 0.02$ indicating a small effect, $f^2 \geq 0.15$ a medium effect, and $f^2 \geq 0.35$ a large effect. Analyses were performed with IBM SPSS Statistics Version 23. Level of significance was set to an alpha of 0.05 and analyses were calculated one-tailed in case of directional hypotheses.

Table 2 Prevalence of students' mental health problems (SDQ) reported by students and parents

Score or subscale	Cut-off[a]	Students' self-report[b] (%)	Report of parents[b] (%)
SDQ total difficulties score	≥17	40.8	31.2
Conduct problems	≥4	45.0	34.5
Hyperactivity	≥6	16.7	16.5
Emotional symptoms	≥6	39.6	36.6
Peer problems	≥3	63.0	53.8

Total number of students reported (N) = 676; total number of parents reported (N) = 333; *SDQ* strengths and difficulties questionnaire, *M* mean, *SD* standard deviation

[a]Cut-off value for clinically relevant mental health problems according to Goodman [37]

[b]Percentages of students (reported by students themselves and parents, respectively) with values above the cut-off point

Results

Descriptive results

Table 1 displays children's and parents' descriptive statistics as indicated in their self-report. Table 2 displays the prevalence of mental health problems of both students' self-report and the reports of their parents. 41% of children reported elevated levels of mental health problems in the past 6 months. Moreover, 31% of parents reported elevated levels of mental health problems of their children.

Association between exposure to violence and mental health problems

Students' self-reports

The first step of the regression analysis showed that children's demographic variables age, gender, and whether their parents were still alive or not (step 1) were significantly related to students' self-reported mental health. Adding peer violence (step 2) improved the model further. Additionally, adding physical and emotional violence by teachers (step 3) improved the model significantly. By adding physical and emotional violence, and neglect by parents (step 4), the model was further improved. The full model explained 22% of the variability of students' mental health problems. As indicated in Table 3, students' gender, exposure to peer violence, to emotional violence by teachers, and to physical violence by parents were positively related to students' self-reported mental health problems.

Report of parents

Parents' demographic factors age, gender, and household income (step 1) were not significantly associated with students' mental health problems. Adding parental stress (step 2) improved the model significantly. Adding the emotional and physical violence applied by parents (step 3) improved the model further. The full regression model of reports of parents explained 20% of the variance of students' mental health problems. As indicated in Table 4, parents' stress and

Table 3 Regression analysis predicting self-reported mental health problems of students

Predictor variables	Mental health problems (SDQ score)			
	B	SE of *B*	*β*	*T*
Step 1[a]				
Age	0.28	0.21	0.05	1.36
Gender	−2.58	0.42	−0.24	−6.21***
Student's parents alive	0.55	0.41	0.05	1.34
Step 2[b]				
Age	0.27	0.20	0.05	1.32
Gender	−2.47	0.41	−0.23	−6.12***
Student's parents alive	0.45	0.40	0.04	1.12
Peer violence	1.27	0.20	0.23	6.22***
Step 3[c]				
Age	0.19	0.19	0.04	0.98
Gender	−2.52	0.38	0.23	−6.58***
Student's parents alive	0.38	0.38	0.04	1.01
Peer violence	0.95	0.20	0.17	4.84***
Emotional violence by teachers	0.06	0.01	0.22	5.31***
Physical violence by teachers	0.02	0.01	0.13	3.08**
Step 4[d]				
Age	0.32	0.19	0.06	1.66
Gender	−2.46	0.38	−0.23	−6.45***
Student's parents alive	0.32	0.38	0.03	0.85
Peer violence	0.90	0.20	0.16	4.56***
Emotional violence by teachers	0.05	0.01	0.20	4.37***
Physical violence by teachers	0.01	0.01	0.07	1.62
Emotional violence by parents	0.01	0.01	0.04	0.80
Physical violence by parents	0.03	0.01	0.15	3.24***
Neglect by parents	−0.02	0.01	−0.04	−1.09

$N = 659$. *B* unstandardized regression weight, *SE* standard error, β standardized regression weight, *T* *t* test statistics; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[a]Test statistics: adj. $R^2 = 0.05$, $F(3, 656) = 13.38$, $p < 0.001$, $f^2 = 0.06$

[b]Test statistics: $\Delta R^2 = 0.06$, $F(1, 655) = 20.30$, $p < 0.001$, $f^2 = 0.06$

[c]Test statistics: $\Delta R^2 = 0.10$, $F(2, 653) = 28.06$, $p < 0.001$, $f^2 = 0.10$

[d]Test statistics: $\Delta R^2 = 0.02$, $F(3, 650) = 21.04$, $p < 0.001$, $f^2 = 0.02$

physical violence by parents were strongly related to adolescents's mental health problems.

Discussion

Prevalence of mental health problems among Tanzanian adolescents

Based on our nationally representative sample of secondary school students, we found a prevalence rate of

Table 4 Regression analysis predicting students' mental health problems reported by parents

Predictor variables	Mental health problems (SDQ score)			
	B	SE of *B*	*β*	*T*
Step 1[a]				
Age	0.04	0.04	0.07	1.18
Gender	−0.17	0.62	−0.02	−0.28
Household income per month	−1.17	0.52	−0.13	−2.26
Step 2[b]				
Age	0.02	0.03	0.03	0.59
Gender	0.33	0.61	0.03	0.55
Household income per month	−0.84	0.50	−0.09	−1.68
Parental stress	0.36	0.07	0.29	5.24***
Step 3[c]				
Age	0.02	0.03	0.03	0.60
Gender	1.00	0.58	0.09	1.74
Household income per month	−0.89	0.47	−0.09	−1.88
Parental stress	0.32	0.07	0.25	4.77***
Emotional violence by parents	0.02	0.02	0.06	1.03
Physical violence by parents	0.09	0.01	0.33	6.03***
Neglect by parents	−0.03	0.02	−0.07	−1.39

Note. $N = 325$, *B* unstandardized regression weight, *SE* standard error, *β* standardized regression weight, *T* *t* test statistics. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[a]Test statistics: adj. $R^2 = 0.01$, $F(3, 322) = 2.18$, $p = 0.09$, $f^2 = 0.01$

[b]Test statistics: $\Delta R^2 = 0.08$, $F(1, 321) = 8.64$, $p < 0.001$, $f^2 = 0.09$

[c]Test statistics: $\Delta R^2 = 0.12$, $F(3, 318) = 12.61$, $p < 0.001$, $f^2 = 0.14$

self-reported mental health problems of 41% in the past 6 months. The report of their parents found a prevalence rate of 31%. With 65% (self-report) or 54% (report of others) peer problems were most prevalent, whereas with 17% (self-report and report of others) the prevalence of hyperactivity was least prevalent. Generally, the self-report of the students and the report of their parents were broadly consistent. Moreover, the current findings indicate that students' self-report scores were generally higher than parents' report scores. This is in concordance with previous studies [39, 40] that indicate that reports about experiences of violence and maltreatment as well as about mental health problems differ from low to moderate levels of agreement between adolescents and their parents due to divergent and different perspectives. One explanation in our sample could be that parents may not have been aware of their children's mental health problems as adolescents rather share their problems with their peers than with their parents. However, we also cannot rule out the possibility that some adolescents may have overemphasized their mental health problems to receive support from the research team.

Generally, our findings are in line with our hypothesis and previous studies in Sub-Saharan Africa [10, 25]. Furthermore, our findings extend previous findings from Tanzania [12–14], as these were based on at-risk groups or specific non-representative samples. In contrast, our study is the first to examine the prevalence of mental health problems in Tanzanian adolescents using a nationally representative sample. Our findings imply that mental health problems are a matter of concern among secondary school students in Tanzania.

Though a previous study from Tanzania reported lower clinically relevant levels of peer problems (8%) and emotional problems (9%) in a sample of primary school children [13], these findings may be explained by two main reasons: first, data were assessed via structured interviews and prevalence rates using structured interviews are generally lower than prevalence rates based on self-administered questionnaires. Second, the sample was assessed in the very specific context of a private primary school that may not be representative for Tanzanian primary schools in general. Nonetheless, it is important to consider that the SDQ was selected as a screening tool to determine the prevalence of mental health problems. Per definition, screening tools have a high sensitivity, but a lower specificity. Future studies using structured clinical interviews are needed to replicate our findings. Notwithstanding, the high rate of mental health problems among secondary students in Tanzania as reported in this study calls—at least—for further attention for research and child protection programs in future.

Association between exposure to violence and mental health problems

The second aim of this study was to investigate the association between exposure to violence and maltreatment, and mental health problems. After controlling for the potential influences of students' age, gender, whether their parents are alive or not, peer violence and violence by teachers, we found an incremental influence of physical violence by parents or primary caregivers on the self-reported mental health problems of adolescents. Yet, emotional violence by parents was not significantly associated with students' mental health problems. In addition, peer violence and emotional violence by teachers were found to be associated with mental health problems of adolescents. In second step, we aimed to replicate these findings using the report of the students' parents or primary caregivers. After controlling for the influence of parents' age, gender, household income, and parental stress, we found a strong association between physical violence by parents and mental health problems of adolescents reported by their parents. In addition, there was a significant association between parental stress and adolescents' mental health problems. Our findings indicate an agreement between the reports of students and their parents regarding the effects of physical violence applied by parents on adolescents' mental state, underlining the strong association between physical violence by parents or caregivers with mental health problems among adolescents.

The findings of this study are partly consistent with previous studies, which found associations between physical, emotional, and peer violence, as well as parental stress and mental health problems in children in different countries [18, 25, 41, 42]. However, in contrast to previous findings we only found a positive association between physical but not emotional violence by parents and adolescents' mental health problems. One explanation could be that physical violence by parents is often accompanied by emotional violence and students may remember and report physical violence rather than emotional violence when they occur together. As a consequence, parts of the effect of physical violence may be also attributed to emotional violence. However, our findings need to be replicated and the hypothesis pointed out here need to be tested further.

Moreover, we found a positive association between emotional—but not physical—violence by teachers and adolescents' self- reported mental health problems. At first glance this finding is surprising. However, the high prevalence of physical violence by teachers and the fact that almost every student is frequently exposed to physical violence [43] may lead to the problem that adolescents may feel more humiliated and ashamed when experiencing emotional violence in front of their peers. As the self-esteem of adolescents is very much depending on their belonging to a peer-group, the threat of losing one's status in the peer-group as a consequence of the humiliation in front of the peers may explain our findings. However, this hypothesis needs to be further investigated in future studies.

Considering the previous findings in Tanzania [12, 14, 26], the current study points in a similar direction, but is based on a nationally representative sample of adolescents' self-reports and the reports of their parents. Previous findings supported the notion that many parents in Tanzania consider harsh discipline as effective in children's behavioral management [14, 44]. As a consequence, parents continue to use violence when raising their children under the assumption that they are not harming their children—an assumption that does not hold when considering the findings of our study as well as previous findings from other settings [19, 20].

Implications and future research

When people and institutions would become aware of the possible consequences of violence and maltreatment, high costs for the health care system could potentially be avoided [45]. A first step will be to inform parents, social workers, institutions, governmental organizations, and the population

at large about the potentially consequences of violence in education. In line with the United Nation's Sustainable Development Goal Nr. 16.2 [46], there is a strong need to design and implement interventions that prevent children from violence by parents. Parents' awareness about effective non-violent discipline strategies may be a starting point for interventions. While this study provides first empirical evidence from a nationwide representative sample on the prevalence of mental health problems and the association between violence and mental health problems in Tanzanian adolescents, future studies that replicate our findings are important. Furthermore, longitudinal and prospective studies will be helpful in understanding the causal relations between violence and mental health problems across the lifespan.

Strengths and limitations

There are some limitations that should be noted: first, the cross-sectional study design does not allow for the establishment of causality, however, the consistency with previous findings on the link between exposure to violence and mental health problems suggests that mental health problems can be the consequence of violence in families and elsewhere. Cultural bias might have influenced our findings, for example, due to the fact that some of the items may not always reflect typical life realities of a Tanzanian child. However, we kept this potential bias to a minimum as Tanzanian researchers played a key role in design and implementation of the study. The applicability of the instruments is further supported by the fact that the results were consistent with previous findings in Tanzania and Sub-Saharan Africa. Although information from both children and parents or primary caregivers was targeted, only just over half of the parents or primary caregivers of the attending students were able to participate.

Conclusions

The present study suggests that mental health problems are prevalent among secondary school students in Tanzania and that there is a strong association between physical violence by parents and mental health problems in children. Our findings emphasize the need to inform the population at large about the potentially adverse consequences associated with violence against children and adolescents. There is a need to design and implement interventions that protect children from violence in the family. Educating parents about effective non-violent discipline strategies might be a starting point. Due to the fact that child violence among society members in Tanzania is normed, societal awareness need to be emphasized.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interests.

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