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Mental health profile and its relation with parental alcohol use problems and/or the experience of abuse in a sample of Moroccan high school students: an explorative study

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Abstract

Background: Studies on mental health are scarce from Arab countries, especially studies focusing on adolescents. In addition to the neurobiological and physiological changes that occur during adolescent development, psychological, societal and cultural influences have strong effects on adolescents' behavior and on their somatic and mental health. The present study aimed (1) to describe the mental health profile, operationalized as psychological distress, of a sample of Moroccan adolescents, and (2) to investigate how specific psychosocial factors (parental alcohol use problems and the experience of physical and/or psychological abuse) may affect adolescents' mental health.

Methods: The sample included 375 adolescents from conveniently selected classes of four high schools in the city of Tetouan in Morocco. The participants responded to an anonymous survey containing, beside other inventories, the Brief Symptom Inventory (BSI) and identified those reporting parental alcohol use problems and/or the previous experience of abuse. The sample characteristics were defined using descriptive statistics. The effects of the defined psychosocial factors were identified using the Kruskal–Wallis test, followed by the post hoc Fisher's least significant difference test.

Results: The most common problems found in high school students from an urban region of Morocco were memory problems, concentration difficulties, restlessness, fear, nervousity and feelings of inadequacy during interpersonal interactions. The female students reported significantly higher psychological distress levels when compared to the male students ($p < 0.001$). The adolescents reporting parental alcohol use problems and the experience of physical/psychological abuse showed significantly higher levels of psychological distress ($p = 0.02$), especially symptoms of somatization ($p < 0.001$), hostility ($p = 0.005$) and anxiety ($p = 0.01$), than those not reporting any of these psychosocial factors.

Conclusion: The mental health profile of female adolescents from an urban area of Morocco is worse than that of their male fellow students. Adolescents reporting parental alcohol use problems and/or the experience of physical/psychological abuse need synchronized support from social- and healthcare services.

Keywords: Adolescents, Brief Symptom Inventory, Experience of abuse, Mental health, Morocco, Parental alcohol use problems

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Introduction

Adolescence is a period of life with specific health and developmental needs. It is one of the most rapid phases of human development, during which adolescents form their identity, learn how to control their emotions and relationships, and acquire various abilities and attributes, such as self-reliance, work orientation, social commitment, openness to sociopolitical change, and tolerance of individual and cultural differences [1], as well as skills that can be important for their well-being [2]. In the adolescent brain there is a heightened responsiveness to stimuli (positive and negative) and to socioemotional contexts, while impulse control is still relatively immature [3]. Therefore, this period of life is characterized by various vulnerabilities for the adolescent. The vulnerabilities include both risky behaviors, such as drug abuse or violence, and vulnerability to psychiatric problems [4, 5]. In Morocco, 8.9% of the population, almost three million individuals, are aged between 15 and 19 years [6]. According to a report by the Moroccan Ministry of Health [7], almost every second adolescent (48.9%) has a problem with insomnia, anxiety and/or depression. One in five children and adolescents in Morocco suffers from a mental disorder; in half of these cases the age of onset was 14. These figures can explain why mental health recently emerged as one of Morocco's main health objectives [7, 8].

The lifestyle of an adolescent's parents has a significant effect on his or her well-being [9]. Adolescents whose parents have alcohol use problems are exposed to an increased risk of developing alcohol or drug use problems themselves, as well as an increased risk of encountering serious psychological problems [10]. Indeed, these adolescents report higher levels of depression, anxiety and/or stress than do adolescents whose parents do not have alcohol use problems [11, 12].

Furthermore, the experience of physical and/or psychological abuse during adolescence may be associated with general psychological distress, conduct problems, and aggression [13–17], as well as with increased risk of severe substance abuse problems [13, 18]. Such abuse is often combined in adolescents with lower self-esteem and higher levels of major depression, anxiety disorder and self-harm behavior [13, 19, 20]. In addition, adolescents with a combined history of physical and sexual abuse show higher scores on dissociation and somatization problems than do adolescents without any history of such abuse [21, 22].

The present study describes the psychological distress level in a sample of adolescents from an urban area in Morocco (the city of Tetouan), and investigates the relation between negative psychosocial factors (parental

alcohol use problems and/or the experience of physical/psychological abuse) and the adolescents' mental health.

Methods

Study population

This study was carried out within the framework of the "Mental and Somatic Health without borders" (MeSHe) project. MeSHe is an international project focusing on culture-specific patterns of mental health profiles coupled to substance abuse and aggressive antisocial behavior in adolescents [23]. The study population included students ($N=375$; 170 males and 205 females) from conveniently selected tenth-, eleventh- and twelfth-grade classes at four high schools in the city of Tetouan, Morocco. With the authorization of the four school directors, data collection was done in the course of the 2014/15 school year. In total, the four high schools had 97 classes. Two classes from each grade and from each school were selected to participate in the study. In the 24 conveniently selected classes there were 876 students enrolled, of which 375 (43%) participated and completed the survey, representing 2.42% of the entire high school student population in the city of Tetouan ($N=15,506$ students spread across 17 high schools). The age range in the study population was 15 to 18 years old and the mean age was 16.56 ($SD=1.04$) years.

Measures

MeSHe background inventory

The MeSHe survey includes, beside a list of validated measures of drug and alcohol abuse, antisocial aggressive behavior, and psychological distress, a detailed background questionnaire assessing the respondent's age, gender, and presence of clinically diagnosed physical health problems. The background section of the questionnaire also contains items about environmental, psychosocial factors. Two of these items are stated as follows: "Have you ever been physically and/or psychologically abused?" and "Do you have a parent who has problems with alcohol?". Based on their answers to these two questions, the responding adolescents in this study were classified into either of four groups: Adolescents not reporting having parental alcohol use problems nor the experience of being abused (comparison group: CG) ($n=250$); adolescents reporting parental alcohol use problems (PAP) ($n=33$); adolescents reporting the experience of physical and/or psychological abuse (PPA) ($n=55$); and adolescents reporting both parental alcohol use problems and the experience of physical and/or psychological abuse (PAP + PPA) ($n=19$). Of the 375 students participating in this study, 18 did not answer one or both of these questions, and were consequently excluded from the comparison between groups.

Brief Symptom Inventory

The MeSHe survey includes the Brief Symptom Inventory (BSI), which is a brief form of the Symptom Checklist Revised (SCL-90-R) [24, 25], a self-reporting inventory developed to measure an individual's level of psychological distress [26]. The BSI has been translated into over 24 languages, including Arabic [27]. In this study, the responding adolescents were asked to rate the general influence of each item on their well-being over the past year.

The BSI contains 53 items, each of which is rated on a five-point Likert scale ranging from 0 ("not at all") to 4 ("extremely"). Nine primary symptom dimensions of psychological distress are assessed within the BSI, namely somatization (SOM), obsessive compulsiveness (OBS), interpersonal sensitivity (INS), depression (DEP), anxiety (ANX), hostility (HOS), phobic anxiety (PHOB), paranoid ideation (PAR), and psychoticism (PSY). In addition to the nine symptom dimensions, the Global Severity Index (GSI), an indicator of the current overall level of distress, can be calculated [28].

The BSI can also be used in non-psychiatric adult populations [29, 30] and adolescents [31]. The BSI's acceptable or good validity and its reliability measures have been established [32, 33]. In this study, the internal reliability of the primary symptom dimensions and the GSI was tested using internal consistency (Cronbach's α); it was found to be acceptable for all dimensions and ranged from 0.71 (PSY) to 0.85 (DEP).

Ethical considerations

The MeSHe survey was designed in accordance with the Helsinki Declaration [34] and its completion is voluntary and anonymous. The use of the survey was approved by the parent associations at each of the four high schools included in the study, by the Regional Directorate of the Ministry of National Education in Tetouan (with the registration number 85), responsible for managing and directing all matters concerning students from primary to high school education at Tetouan province, and by the Faculty of Science, University Abdelmalek Essaadi. Completion of the survey was considered as consent to participate.

All potential participants received a short written and oral presentation of the MeSHe project and its aims, and were given opportunity to discuss the project and their eventual participation with a responsible researcher; they were also offered the opportunity to leave the classroom if they did not want to participate in the study. The students were assured that their decision whether or not to participate would have no effect on their school record.

The data from the responding students were collected on anonymous survey sheets.

Statistical analysis

The sample characteristics were defined through descriptive statistics using SPSS version 21.0 (IBM). Because the scores of the BSI dimensions were not normally distributed in the study population, non-parametric statistical analyses were used. The Mann–Whitney U test was used to compare the scores of male and female students. The Kruskal–Wallis test was applied to compare the means ranks between the adolescents not reporting parental alcohol use problem nor the experience of abuse, the adolescents reporting parental alcohol use problems, the adolescents with experience of physical and/or psychological abuse, and the adolescents reporting both problems.

Post hoc (Fisher's least significant difference) tests were applied for multiple testing regarding the differential interactions between the student groups. All the analyses were two-tailed and the significance level was defined at $p < 0.05$.

Results

Mental health of Moroccan adolescents from an urban area

Table 1 summarizes the mean values for each of the nine primary symptom dimensions of the Brief Symptom Inventory (BSI) and for the General Severity Index (GSI) in the Moroccan student sample. Generally, the responding Moroccan female students reported higher psychological distress when compared to their responding male fellow students. The female students scored significantly higher on all but one of the primary symptom dimensions; the exception being the "hostility" dimension where no significant difference could be measured between the genders. The generally higher psychological distress level in the female students is reflected also in their significantly higher GSI score.

Mental health of Moroccan adolescents reporting parental alcohol use problems or the experience of abuse

The majority of the responding high school students did not report the experience of physical nor psychological abuse (80.5%) and had no parent with alcohol use problems (86.4%). Nevertheless, a substantial number of adolescents reported the experience of physical and/or psychological abuse (14.7%) or the presence of at least one parent with problematic use of alcohol (8.8%). Of the students, 5.1% ($n = 19$) reported that they had experienced both physical and/or psychological abuse and a parent with alcohol use problems. There were significantly more male than female students reporting parental alcohol use problems (males: 11%; females: 7.8%;

Table 1 Self-reported psychiatric problems in the general population of Moroccan adolescents (N = 375)

| BSI subscales | Moroccan adolescents M (SD) | Male (n = 144–169) ^a M (SD) | Female (n = 163–199) ^a M (SD) | p |
|---------------------------|--------------------------------|---|---|--------|
| Somatization | 1.25 (0.83) | 0.99 (0.78) | 1.47 (0.81) | <0.001 |
| Obsessive compulsiveness | 1.73 (0.83) | 1.53 (0.82) | 1.90 (0.81) | <0.001 |
| Psychoticism | 1.39 (0.87) | 1.26 (0.81) | 1.50 (0.9) | 0.02 |
| Depression | 1.22 (0.89) | 1.07 (0.81) | 1.34 (0.94) | 0.01 |
| Interpersonal sensitivity | 1.52 (0.94) | 1.17 (0.83) | 1.81 (0.92) | <0.001 |
| Hostility | 1.29 (0.82) | 1.19 (0.76) | 1.38 (0.86) | 0.06 |
| Phobic anxiety | 1.16 (0.82) | 0.96 (0.78) | 1.34 (0.82) | <0.001 |
| Anxiety | 1.58 (0.87) | 1.24 (0.74) | 1.84 (0.88) | <0.001 |
| Paranoid ideation | 1.48 (0.83) | 1.36 (0.81) | 1.59 (0.83) | 0.02 |
| GSI | 1.38 (0.68) | 1.20 (0.67) | 1.54 (0.65) | <0.001 |

^a The number of responses varies for the different subscales of the BSI

$p=0.002$), or reporting both parental alcohol use problems and the experience of abuse (males: 9.8%; females: 1.6%; $p=0.03$), whereas there were more female than male students reporting the experience of physical and/or psychological abuse, although this difference did not reach the significance level (females: 17.1%; males: 13.4%; $p=0.36$). Because of the differences in the gender distribution in the responses to these questions, the level of psychological distress was analyzed separately.

In the PAP group (in both male and female students reporting parental alcohol use problems) none of the nine primary symptom dimension scores differed from the scores of the comparison group (CG).

The male students who reported both parental alcohol use problems and the experience of physical and/or

psychological abuse (the PAP + PPA group) scored significantly higher than the male students not reporting any of these problems (CG) in the somatization ($p<0.001$), the hostility ($p=0.005$) and the anxiety ($p=0.01$) primary symptom dimensions, as well as in the GSI ($p=0.01$) (Table 2). The female students from the PPA group scored significantly higher in the somatization ($p<0.001$), the obsessive-compulsiveness ($p=0.01$), the psychoticism ($p=0.003$), and the anxiety ($p=0.04$) primary symptom dimensions compared to the female students in the CG; they also indicated significantly higher psychological distress levels in the depression ($p=0.01$) and the hostility ($p=0.03$) primary symptom dimensions, as well as in the GSI ($p=0.005$), compared to the female students in both the CG and PAP groups (Table 3).

Table 2 Self-reported psychological distress in adolescent Moroccan males by psychosocial variable groups

| | CG (n = 108) M (SD) | PAP (n = 18) M (SD) | PPA (n = 22) M (SD) | PAP + PPA (n = 16) M (SD) | Difference between groups | | |
|---------------------------|------------------------|------------------------|------------------------|------------------------------|---------------------------|---------|---|
| | | | | | Test-stat (H) | p value | Post hoc |
| Somatization | 0.90 (0.71) | 0.94 (0.94) | 1.07 (0.72) | 1.63 (0.87) | 10.42 | 0.02 | CG < PAP + PPA* PAP < PAP + PPA* PPA < PAP + PPA* |
| Obsessive compulsiveness | 1.47 (0.80) | 1.65 (1.08) | 1.53 (0.92) | 1.75 (0.50) | 1.73 | 0.63 | NS |
| Psychoticism | 1.17 (0.80) | 1.3 (1.00) | 1.46 (0.77) | 1.55 (0.75) | 4.85 | 0.18 | NS |
| Depression | 1.01 (0.82) | 1.17 (1.00) | 1.07 (0.83) | 1.27 (0.49) | 2.85 | 0.41 | NS |
| Interpersonal sensitivity | 1.13 (0.83) | 1.15 (0.89) | 1.00 (0.77) | 1.55 (0.89) | 3.93 | 0.27 | PPA < PAP + PPA* |
| Hostility | 1.10 (0.72) | 1.21 (0.93) | 1.18 (0.69) | 1.67 (0.79) | 7.26 | 0.06 | CG < PAP + PPA* PPA < PAP + PPA* |
| Phobic anxiety | 0.89 (0.74) | 0.91 (0.83) | 1.04 (0.81) | 1.25 (0.90) | 2.49 | 0.48 | NS |
| Anxiety | 1.16 (0.70) | 1.22 (0.82) | 1.25 (0.75) | 1.69 (0.79) | 5.93 | 0.11 | CG < PAP + PPA* |
| Paranoid ideation | 1.26 (0.73) | 1.35 (0.89) | 1.60 (1.00) | 1.61 (0.86) | 3.85 | 0.28 | NS |
| GSI | 1.12 (0.66) | 1.28 (0.8) | 1.19 (0.7) | 1.56 (0.54) | 6.28 | 0.10 | CG < PAP + PPA* |

CG comparison group, PAP adolescents reporting parental alcohol use problems, PPA adolescents reporting the experience of physical and/or psychological abuse, PAP + PPA adolescents reporting both parental alcohol use problems and the experience of physical and/or psychological abuse

* $p<0.05$

Table 3 Self-reported psychological distress in adolescent Moroccan females by psychosocial variable groups

| | CG (n = 142) | PAP (n = 15) | PPA (n = 33) | PAP + PPA (n = 3) | Difference between groups | | |
|---------------------------|--------------|--------------|--------------|-------------------|---------------------------|---------|--------------------------|
| | (Min–Max) | (Min–Max) | (Min–Max) | (Min–Max) | Test-stat (H) | p value | Post hoc |
| Somatization | 1.40 (0.83) | 1.41 (0.77) | 1.79 (0.81) | 1.76 (0.44) | 6.84 | 0.08 | CG < PPA* |
| Obsessive compulsiveness | 1.83 (0.81) | 1.56 (0.85) | 2.23 (0.74) | 2.11 (0.92) | 9.04 | 0.03 | CG < PPA* PAP < PPA* |
| Psychoticism | 1.40 (0.91) | 1.31 (0.52) | 1.92 (0.86) | 0.80 (0.69) | 12.23 | 0.01 | CG < PPA* PAP < PPA* |
| Depression | 1.22 (0.90) | 1.12 (0.62) | 1.87 (1.02) | 0.94 (0.35) | 12.37 | 0.01 | CG < PPA** PAP < PPA* |
| Interpersonal sensitivity | 1.73 (0.90) | 1.49 (0.61) | 2.03 (0.99) | 2.25 (0.66) | 6.13 | 0.10 | NS |
| Hostility | 1.27 (0.86) | 1.24 (0.60) | 1.83 (0.81) | 1.40 (0.92) | 12.39 | 0.01 | CG < PPA** PAP < PPA* |
| Phobic anxiety | 1.31 (0.83) | 1.23 (0.82) | 1.50 (0.84) | 0.80 (0.00) | 2.94 | 0.40 | NS |
| Anxiety | 1.77 (0.88) | 1.59 (0.61) | 2.12 (0.94) | 2.22 (0.36) | 4.99 | 0.17 | CG < PPA* |
| Paranoid ideation | 1.53 (0.84) | 1.38 (0.58) | 1.77 (0.87) | 1.27 (0.46) | 2.6 | 0.46 | NS |
| GSI | 1.45 (0.64) | 1.37 (0.49) | 1.92 (0.63) | 1.52 (0.16) | 13.13 | <0.01 | CG < PPA** PAP < PPA* |

CG comparison group, PAP adolescents reporting parental alcohol use problems, PPA adolescents reporting the experience of physical and/or psychological abuse, PAP + PPA adolescents reporting both parental alcohol use problems and the experience of physical and/or psychological abuse

* $p < 0.05$; ** $p < 0.001$

Discussion

Mental health of Moroccan adolescents from an urban region

To the best of our knowledge, this study is the first to investigate the self-reported mental health of Moroccan adolescents. To measure mental health and symptomatic behavior, the well-known clinical instrument known as the Brief Symptom Inventory (BSI) [24, 26] was used. Although this instrument is most often used in clinical populations to measure treatment effects by assessing the patient's feelings, it is also often used to measure mental health profiles in non-clinical populations as well. For instance, the BSI was used in a study assessing an adolescent sample of the general population in Israel [31]. Said study emphasized the need for culture-specific BSI norm-data in adolescent populations, as significant differences could be shown between American and Israeli adolescents' scores in somatization, hostility, phobic anxiety, paranoid ideation and psychoticism, and between the two group's overall distress score (GSI), with the American students reporting higher psychological distress levels [31, 35]. When we compare the levels of psychological distress reported in this study's sample of Moroccan adolescents with the levels found in American and Israeli adolescents, we note that the Moroccan scores are the highest. However, this comparison should be handled with caution as the data from studies performed so far apart in time. To be able to establish culture-specific differences in adolescents' psychological distress levels, we would need to compare our data with more recent

studies. In the absence of such data, our only conclusion can be that adolescents living in a Moroccan urban area in 2014–2015 reported more symptoms and higher levels of psychological distress than did adolescents in developed or developing countries 10–20 years ago.

In line with previous studies [36–41], the scores of the male and female students in the present study differed significantly, with female students reporting more symptoms on all the BSI subscales, with the exception of hostility. Other studies have suggested that being female is associated with a higher prevalence of auditory verbal hallucinations, earlier onset of psychotic illness, greater affiliative need, and greater sensitivity to both conflict and rejection within interpersonal relationships [42–45]. These gender differences in the mental health profile of adolescents may be explained by gender-specific genetic factors [46–48], hormones [49], brain structure, function, circuitry, and pharmacokinetics [50, 51], but also by gender-specific exposure levels to the specific psychosocial environmental risk factors [50, 52].

Mental health of Moroccan adolescents reporting parental alcohol use problems or reporting the experience of abuse

In the present study, we found that significantly more male than female students reported having parental alcohol use problems. These male students also reported high levels of psychological distress, manifested by their higher scores in the somatization, hostility, and anxiety dimensions of the BSI, when compared to their male classmates not reporting any of these problems

(comparison group). These results may be explained by the fact that children of parents with alcohol use disorder exhibit a large probability of an earlier onset of substance use [11], of suffering from neglect [53], and of having cognitive deficit, behavioral and emotional difficulties, and psychosocial adjustment problems [54–57], and of having mental disorders [58]. Consequently, the presence of traumatic experiences in addition to the presence of a parent with problematic alcohol use may increase the risk of neurodevelopmental impairment [59]. Previous research has shown that abused children and adolescents are at higher risk of exhibiting aggression [60–62] and deficits in their emotional regulation [63]. Generally, emotional dysregulation is positively correlated with hostility [64] and represents a risk factor for internalizing problems, such as anxiety and somatic complaints [65].

Our results also show that the female students who reported the experience of physical/psychological abuse also reported higher levels of psychological distress, captured by significantly higher scores in the somatization, obsessive compulsiveness, psychoticism, anxiety, depression and hostility dimensions of the BSI, than did their female classmates in the comparison group. Previous research has found similar results, suggesting that the experience of abuse by female adolescents is significantly associated with anxiety, depression, dissociative disorder, and aggressive behavior [66–68]. Furthermore, previous research has shown that abuse of female adolescents may be associated with dysregulation of their emotional patterns [69], post-traumatic stress disorders [70], and low self-esteem [71], which are strongly linked to internalizing and externalizing behaviors, and negative affect such as depression, anxiety, hostility, somatization and psychoticism [72–74]. In our study population there were significantly more male than female students reporting both parental alcohol use problems and the experience of abuse. This may be an effect of the Islamic culture and education, which dissuades Arab female adolescents from reporting being physically or psychologically abused within their family, which may increase their feelings of solitude and isolation, which in turn are strongly associated with various psychiatric disorders [75–77].

Conclusion

The present study provides the first insights into the self-reported mental health profiles of Moroccan adolescents and underlines the need for new assessments in order to make international comparisons.

The study provides evidence that female high school students report higher psychological distress levels compared to their male classmates. Furthermore, the study confirms the serious and diverse negative relation between parental alcohol use problems and/or of

the experience of physical/psychological abuse and the mental health of adolescents. Interventions and support for these adolescents from both social- and healthcare organizations are warranted.

Limitations

The study had a cross-sectional design not allowing any causality analyses. Despite including data from almost 400 adolescents, the study's generalizability is limited; the study population represented only a fraction of all adolescents in Morocco and was selected from schools in only one city. The study's use of self-reporting entails well-known limitations, namely that self-report questionnaires depend on the respondent's ability and willingness to remember and answer truthfully; responses may be distorted by social desirability and recall biases [78].

The assessment of the physical and/or psychological abuse did not include the degree or frequency of abuse, any associated disability, or information on the specific type of abuse experienced by the adolescent. It is noteworthy that, based on this limitation and other recognized limitations of the assessed data, an improved version of the survey has been developed for future use in the MeSHe project.

Abbreviations

ANX: anxiety; BSI: Brief Symptom Inventory; CG: comparison group; DEP: depression; GSI: global severity index; HOS: hostility; INS: interpersonal sensitivity; MeSHe project: Mental and Somatic Health without borders project; OBS: obsessive compulsiveness; PAP: adolescents reporting having parents with alcohol problems; PAP + PPA: adolescents reporting both parental alcohol use problems and the experience of physical and/or psychological abuse; PAR: paranoid ideation; PHOB: phobic anxiety; PPA: adolescents reporting the experience of physical and/or psychological abuse; PSY: psychoticism; SOM: somatization.

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Authors' contributions

BZ: data collection, data analysis, drafting and revision of the manuscript. AS: statistical assistance, drafting of the manuscript. BHA: intellectual feedback and revision of the manuscript. MS: supervision of data collection, critically important intellectual feedback on the interpretation of the results, revision of the manuscript. NK: design and direction of the "Mental and Somatic Health without borders (MeSHe)" project, study design, data interpretation, monitoring of manuscript progress and revisions. All authors read and approved the final manuscript.

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Availability of data and materials

The data sets used and/or analyzed in the course of this study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

All procedures involving human participants were performed in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. With reference to Morocco, there is no national

ethical committee, but the parent associations of the participating schools, the Regional Directorate of the Ministry of National Education in Tetouan and the Faculty of Science, University Abdelmalek approved the study. Completion of the survey was considered as consent to participate.

Consent for publication

Formal consent for publication is not required for this type of study; participation was voluntary and anonymous. The survey's cover page informed the participants about the questionnaire's content and aim, and stressed that participation in the anonymous data collection was entirely voluntary.

Competing interests

The authors declare that they have no competing interests.

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