

An Evaluation of Adolescent Mental Health in a Secondary School in Beijing

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Abstract

According to the World Health Organization, there is a growing trend of mental health problems such as depression, anxiety and suicide amongst Mainland Chinese adolescents. Given a recent surge in mental health problems in China, further investigation is urgently called for. The current study was mainly aimed at obtaining severity estimates and prevalence of major mental health issues faced by adolescents. A total of 1,083 students (503 males and 580 females) from a high school in Beijing participated in the project. Descriptive statistical analyses, independent sample t-tests, and Pearson Product-moment correlations were conducted. 17.9% are screened positive for depression and are categorized as having moderate depression. A significant proportion of students are overweight (30.1%) and underweight (20.4 %). Such findings point to the need for screening and corresponding intervention at school level. School-based interventions are able to capture potentially clinical cases that otherwise go undetected, shortening the delay in treatment, which in turn improve prognosis and thus decrease the number of relapses. Follow-up actions should be implemented in order to further improve students' physical as well as psychological health.

Key words: Chinese policy, mental health, depression, screening, adolescents.

Introduction

Based on data collected from a Beijing school on student physical and mental health conditions, this study deploys quantitative methods to evaluate mental health of adolescent students. It undertakes assessments of the prevalence of depressive symptoms and related factors including anxiety, body dissatisfaction, Body Mass Index (BMI), self-efficacy, and mathematics anxiety, which are particularly relevant to adolescents. Findings of this study will shed light on the prevalence of depressive symptoms in Mainland Chinese adolescents. Possible correlations with anxiety, body dissatisfaction, Body Mass Index (BMI), self-efficacy, and mathematics anxiety and self-efficacy will also be established. Recommendations for follow-up actions will be made.

Background

According to the WHO (World Health Organization, 2010), there is a growing trend of mental health problems such as depression, anxiety and suicide amongst Mainland Chinese adolescents. Alarmingly, more than 30 million individuals under the age of 17 years had mental health problems, of which 50-70% failed to seek medical assistance. As early detection facilitates and improves prognosis, it is therefore of utmost importance to identify such cases at an early stage. In the twentieth century, the Chinese Government had begun to implement measures to address adolescent mental health problems with rigour. In 2002, Professor Zhang Houcan, a leading psychologist reported that schools with good resources had been able to design courses on mental health in the curriculum. Counselling centres in support of students who needed help have also been established. Nevertheless, she pointed out that there was great need for resources to enhance the quality of mental health education amongst teachers in all schools. To her, that was the only way to achieve quality education beyond the theoretical stage (Zhang, 2004). Adolescents who did not have sense of security, lacked communication skills and experienced failures in their learning process were more vulnerable to developing mental problems (World Health Organization, 2012). On the contrary, adolescents who were physically and mentally sound would be able to withstand pressure, solve problems and communicate well with others. In terms of guidance for teachers, educationists identify the varying needs for counselling support in the different schooling phases. The special needs for students in the 11-15 age range have been well specified. (Curriculum Materials Research Institute, 2013). Students in this age range become more independent and like to make their own decisions. Teachers are advised to respect their views but at the same time positively steer them in the right direction.

In step with the need to address mental problems identified by the WHO in 2010 and by educationists and psychologists, The Chinese Ministry of Education promulgated "Essential Instructions on Mental Health Education to Middle and Primary Schools" in 2012. It proposed that "schools should establish well-organized service system for mental health education in order to enhance mental health quality for all students" (Ministry of Education, 2012). The "Essential Instructions" contain policy deliberations in order to ensure that schools are able to design the contents and appropriate measures to implement mental health education. For junior primary schools, the contents should help students to get accustomed to the new environment and exercise self-control. For senior primary schools, the contents should help students express emotion. For junior secondary schools, the contents should enable students to understand their physical and mental health condition during puberty. For senior secondary schools, the contents should foster positive interpersonal communication and self-confidence in life. Appropriate measures include holding thematic seminars, develop individual and group counselling services which are able to make referrals when handling serious mental health cases. There should not be any attempt for these services to introduce clinical components. The "Essential Instructions" also deliberate

on the need for The Ministry to provide leadership and management support, which includes inspection and evaluation, teacher training and funding for research. The present study responds to the Ministry's decision to address mental health problems amongst adolescents, and initiated school-based mental health screenings. Schools are in a position to reach out to adolescents who may be otherwise difficult to identify in the usual medical settings. Our investigation follows guidelines provided by the National Education Science Project on "Student Health Quality Assessment Indicators System". The Project was launched in 2014 in support of the deliberations of the "Essential Instructions". Mental health education was one of the core components of the Project (Fu, 2014).

Depression and its related factors

Depression is the leading cause of disability in the world (World Health Organization, 2010). It has also been predicted to become the second leading burden of disease worldwide, by the year 2020 (Murray & Lopez, 1996). It is the most common mental disorder, with a lifetime prevalence of 10-15% (Lépine & Briley, 2011). Depression is associated with poor psychosocial and occupational functioning, suicide, high relapse rates and often poor clinical outcomes (Stoep et al., 2003). Two-thirds of individuals who ended their lives by suicide were depressed (Henriksson et al., 1993). Depression is in fact a major risk factor contributing to suicide attempts. In other words, prevention of depression is conducive to decreasing the lifetime prevalence of suicide attempts (Bernal et al., 2007). A striking 65% of adolescents reported experiencing depressive symptoms (Lewinsohn et al., 1993). It has been reported that around 1.3% of Hong Kong Chinese adolescents had depression (Leung et al., 2008). Promising results have been reported in relation to school-based interventions on depression (Garber et al., 2009) Intervention programmes significantly decreased depressive symptoms, incidence of depression and relapse rates (Shochet, 2001). Since early intervention of depression in adolescents is associated with reduced risk of recurrence in adulthood (Harrington et al., 1998), screenings should be conducted in order to decrease disability and burden of disease. One added complication of depression is its high comorbidity, making the condition even more difficult to treat.

Individuals with depression have been reported to have other mental health concerns such as anxiety (Cummings, Caporino, & Kendall, 2014), body dissatisfaction (Goldfield et al., 2010) low self-efficacy (Muris, 2002) and academic problems (Coelho, Martins, & Barros, 2002). Such problems are particularly relevant to adolescents and thus will be the focus of the current study.

Body dissatisfaction is commonly experienced in adolescents, particularly in girls undergoing puberty. Adolescents are under the constant bombardment of thinness ideal messages from the media, peers and family. Research findings indicated that such socio-cultural pressures to be thin are associated with dieting behaviors and body image distortions (Blowers et al., 2003), which may ultimately damage physical as well as mental health. A gender difference has consistently been found in the literature

regarding body dissatisfaction and eating disorders, with a higher prevalence in females than in males (Striegel-moore et al., 2009). Children as young as 7 to 9 years of age have been reported to be experiencing body dissatisfaction and engaging in dieting behaviors. Such experience and dieting may negatively affect mental well-being and stunt growth (Maloney et al., 1989). Compared to females of other ages, adolescent girls are most prone to body dissatisfaction and eating disorders as they go through puberty. This is the time when adolescent girls experience an increase in adipose tissues (Ferreiroa, Seoaneb & Senraa, 2014). A bi-directional relationship between body dissatisfaction and depression has been found (Presnell et al., 2009), suggesting an intricate underlying mechanism.

Anxiety is another psychological correlate that is highly comorbid with depression. Anxiety disorders are ranked closely behind depression in terms of cause of disability. Among the top utilizers in primary care settings, 24% and 22% were diagnosed with depression and anxiety disorder respectively (Katon et al., 1990). Around 50% of depression patients have been diagnosed with anxiety disorder at the same time (Hirschfeld, 2001). Such comorbidity is problematic, as it worsens prognosis, slows recovery, and increases the number of relapses. In school settings, anxiety may be brought about by pressures to achieve or perform. In particular, anxiety towards mathematics has been commonly observed. Some students would use all means to avoid performing mathematical calculations (Ashcraft, 2002). However, avoidance will only lead to less practice and consequently poorer performance. In higher education, students with mathematics anxiety feel more negatively towards mathematics courses and hence avoid such courses. Avoidance may limit competence in mathematics and career choices. Mathematics anxiety has been found to be associated with low self-efficacy (Wei, 1996), which is cognitive in nature, i.e. it is a perceived inability to achieve, irrespective of actual performance. Studies have reported a statistically insignificant gender difference in students' mathematical performance. However, females and males differed in their level of self-efficacy on mathematics, leading to an underrepresentation of females in mathematics-related disciplines. Thus, self-efficacy, i.e. a student's confidence or perceived ability in reaching goals or coping with difficulties is of paramount importance to academic performance (Bandura, 1977; Bandura, 1997; Hackett and Betz, 1989). Interventions should therefore adjust maladaptive or inaccurate cognitive thoughts, leading to corresponding changes in behavior.

Unlike physical or behavioural disorders with observable signs or symptoms which are more easily detected by teachers, parents or carers, the symptoms of mental disorders are often more subtle and cognitive in nature. Self-report screenings are able to overcome these drawbacks and minimize social desirability issues pertinent to face-to-face interviews (Malone et al., 1995). The attractiveness of mental health screenings lies in its ability to identify sub-clinical cases. The sooner such cases receive professional assistance and treatment, the better the clinical outcome will be, leading to corresponding decreases in burden of disease, morbidity and mortality.

Since around 50% of high school drop-out cases are due to mental disturbances (Stoep et al., 2003), school-based screenings and interventions are strongly justified. However, despite various efforts to design and implement school-based mental health interventions in the West, there is a paucity of research on mental health screenings and follow-up programmes in Mainland China. Given a recent surge in mental health problems in China, further investigation is urgently called for. The current study was mainly aimed at obtaining severity estimates and prevalence of major mental health issues faced by adolescents. Recommendations for corresponding follow-up actions for screening and intervention will be made.

Objectives

The aims of this study are:

- To evaluate student health and fitness with a view to assessing how many adolescents are underweight, overweight and obese;
- To obtain prevalence rates and severity estimates of mental health measures;
- To provide findings and make recommendations in support of The Ministry of Education's strategic plan to promote physical and mental health education in schools.

Method

Participants

Convenience sampling was employed. A total of 1,083 students (503 males and 580 females) from a high school in Beijing participated in the project. Participants were from Forms 1, 2, 4 and 5, equivalent to Grades 7, 8, 10 and 11 in the West.

Data from school

Academic records (mathematics) were provided by the school. Physiological and anthropometric data including height, weight, blood pressure, pulse rate, pulse oximetry, vital capacity, visual acuity, and fitness (grip test) were collected. Body Mass Index (BMI) was calculated by dividing weight in kilograms by height in meters squared.

Survey

Procedures

The survey took place during the period of March 1-14, 2015. Parental and student informed consent were obtained. The questionnaire was administered to students by researchers during class time. Standardized instructions were read aloud to students, assuring them that their data would be kept strictly confidential and anonymous, and that data obtained would be analyzed collectively, i.e. individual students would not be

identified. Students were asked to answer all questions, but they were allowed to withdraw participation whenever they felt any discomfort or distress, which was not anticipated. The survey took around 45 minutes to complete. Questionnaires were collected by the researchers, put into opaque envelopes, sealed and signed in front of students. The response rate was 81%.

Measures

This study focused on the two main public health concerns for adolescents, which are depression and anxiety. Both are common psychiatric illnesses and are major public health problems in many countries, damaging the affected individual's health, well-being, and quality of life. In addition, relevant correlates important to adolescents were investigated, including body dissatisfaction, self-efficacy and mathematics anxiety.

Demographics

Background information including gender, date of birth, age, height, weight and waist circumference was collected. Date of birth, grade and class were used to generate a unique serial number in order to link up survey data with physiological data, including measured anthropometric data. Self-report height and weight data were used as a backup.

Depression

Depressive symptoms were measured using the Patient Health Questionnaire-9 (PHQ-9), which is a valid and reliable scale designed to screen for Major Depressive Disorder (Richardson et al., 2010). It also possesses high specificity and sensitivity (Kroenke et al., 2001). PHQ-9's brevity and close mapping with the Diagnostic and Statistical Manual of Depressive Disorders (DSM-IV) have contributed to its popularity. The scale consists of 9 items on the frequency of depressive symptoms experienced, on a 4-point scale, with scores ranging from 0 (not at all) to 3 (nearly every day).

Anxiety

Trait-anxiety was measured using the trait subscale of Spielberger State-Trait Anxiety Inventory (STAI-T; Spielberger, Gorsuch, & Lushene, 1970). It is a widely adopted scale containing 20 general anxiety items on a 4-point scale, with scores ranging from 1 (almost never) to 4 (almost always.). Norm data suggested an average score of 34.89.

Body Dissatisfaction

Body dissatisfaction was assessed using the Figure Rating Scale (FRS; Stunkard, Sorensen, & Schulsinger, 1983). It features 9 body silhouettes with a corresponding ordinal scale, with ratings ranging from 1 to 7. Subjects were asked to choose the silhouette that corresponds to their current and ideal body shapes respectively. The difference between the two ratings indicates the level of body dissatisfaction.

Mathematics Anxiety

The level of mathematics anxiety was assessed using Mathematics Anxiety Scale for Children (MASC; Chiu & Henry, 1990), on a 4-point scale, with scores ranging from 1 (no anxiety) to 4 (high anxious). It is a valid and reliable scale suitable to be administered to youngsters.

Self-efficacy

Self-efficacy was measured using the General Self-efficacy Scale (GSES; Schwarzer & Jerusalem, 1995; Zhang & Schwarzer, 1995). It is a 10-item scale on perceived self-efficacy, rated on a 5-point scale, with scores ranging from 1 (not at all true) to 4 (exactly true). Total scores range from 10 to 40. It has been shown to possess high validity and reliability.

Statistical Analysis

Statistical Package for the Social Sciences (SPSS) software was used for statistical analyses. Descriptive statistical analyses, independent sample t-tests, and Pearson Product-moment correlations were conducted.

Results

BMI (Body Mass Index)

Table 1: BMI classification for Asians (World Health Organization, 2000)

BMI Classification					
Classification	Underweight	Normal range	Overweight		
			Pre-obese	Obese I	Obese II
BMI (kg/m ²)	Below 18.5	18.5 - 22.9	23 - 24.9	25 - 29.9	30 or above

Figure 1: Distribution of BMI groupings

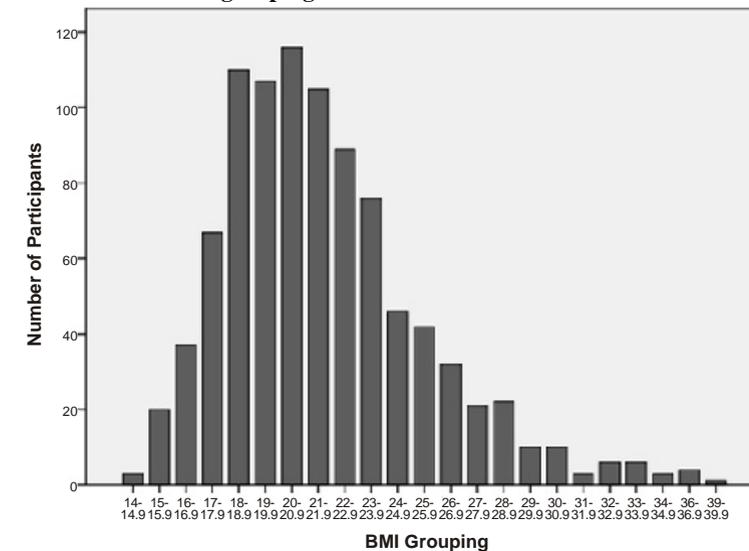


Figure 2: BMI classifications by gender

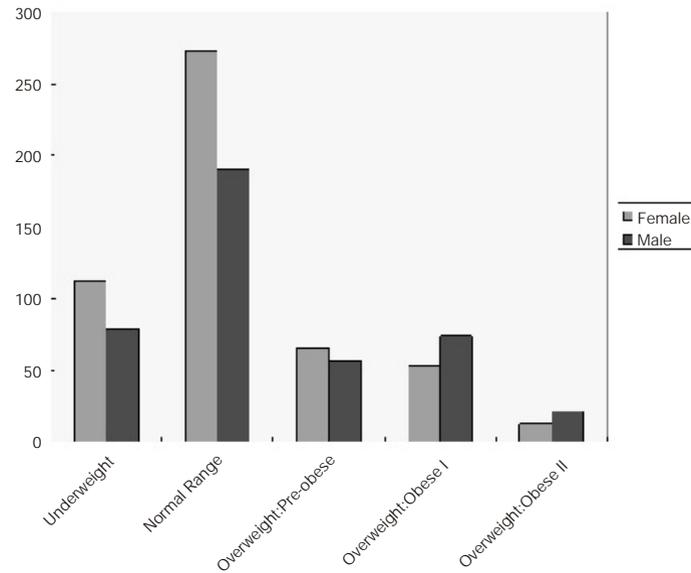
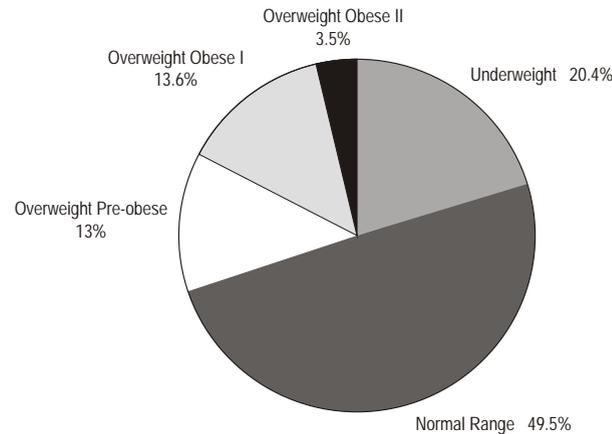


Figure 3: BMI classifications in percentages



The above pie chart indicates that 30.1% and 20.4 % of students are overweight and underweight respectively.

Body Dissatisfaction

The average body dissatisfaction for the overall sample is 0.56 (S.D. = 1.1). For male adolescents, the average body dissatisfaction score is 0.26 (S.D. = 1.1) while average body dissatisfaction score for females is 0.82 (S.D. = 1.24).

Independent samples t-test reveals that the average body dissatisfaction score in females is significantly higher than that in males ($t = -0.56, p < 0.01$).

Mathematics Anxiety

The average mathematics anxiety score for the overall sample is 36.01 (S.D. = 13.15), with a male average of 34.1 (S.D. = 13.19) and a female average of 37.64 (S.D. = 12.62).

Independent samples t-test reveals that average mathematics anxiety level for females is significantly higher than that for males ($t = -3.77, p < 0.01$).

Correlation analysis reveals that mathematics anxiety is negatively correlated ($r = -0.159, p < 0.01$) with mathematics performance in the overall sample.

Both male and female samples have similar correlation patterns between mathematics performance and anxiety, with a higher coefficient ($r = -0.23, p < 0.01$) in males compared to females ($r = -0.13, p < 0.01$).

Trait Anxiety

The average trait anxiety score for the overall sample is 42.49 (S.D. = 9.26), with a male average of 42.32 (S.D. = 9.82) and a female average of 42.47 (S.D. = 8.76).

Independent samples t-test reveals that there are no gender differences ($t = -0.02, p > 0.05$) in average trait anxiety score.

Depression

The average depression score for the overall sample is 6.12 (S.D. = 6.65), with a male average of 6.21 (S.D. = 6.02) and a female average of 6.01 (S.D. = 5.28). 154 students (17.9%; 20% in girls and 17.2% in boys) are screened positive for depression (PHQ-9 score of 10 or above; Manea, Gilbody & Mcmillan, 2012) and are categorized as having moderate depression.

Independent samples t-test reveals that there are no gender differences ($t = 0.47, p > 0.05$) in average depression score.

Self-efficacy

The average self-efficacy score for the overall sample is 26.82 (S.D. = 6.92), with a male average of 28.19 (S.D. = 7.49) and a female average of 25.82 (S.D. = 6.25).

Independent samples t-test reveals that average self-efficacy score for males is significantly higher than that for females ($t = 4.67, p < 0.01$).

Correlations among variables

Correlation analysis indicates that, in the overall sample, body dissatisfaction is positively correlated with BMI ($r = 0.62, p < 0.01$), depression ($r = 0.079, p < 0.05$), and trait anxiety ($r = 0.10, p < 0.01$).

In males, body dissatisfaction is positively correlated with BMI ($r = 0.66, p < 0.01$) only. In females, body dissatisfaction is positively correlated with BMI ($r = 0.70, p < 0.01$), depression ($r = 0.14, p < 0.01$) and trait anxiety ($r = 0.16, p < 0.01$).

Self-efficacy is negatively correlated with trait anxiety ($r = -0.38, p < 0.01$) and mathematics anxiety ($r = -0.18, p < 0.01$). No gender differences are found.

Discussion and Conclusion

Average trait anxiety and depressive symptom levels are mild. However, 17.9% are screened positive for depression (PHQ-9 score of 10 or above; Manea, Gilbody & Mcmillan, 2012). They are categorized as having moderate depression. A significant proportion of students are overweight (30.1%) and underweight (20.4 %). As expected, body dissatisfaction is significantly higher in female students compared to their male counterparts. In males, body dissatisfaction is positively correlated with Body Mass Index (BMI). On the other hand, in females, body dissatisfaction is also positively correlated with trait anxiety and depressive symptoms, in addition to BMI. Self-efficacy is of moderate level, with higher scores in boys relative to girls. It is positively correlated with body dissatisfaction, and negatively correlated with trait anxiety and mathematics anxiety.

Recommendations for Follow-up Actions

Such findings point to the need for screening and corresponding intervention at school level. School-based interventions are able to capture potentially clinical cases that otherwise go undetected. They shorten the delay in treatment, which in turn improve prognosis and decrease the number of relapses. Previous school-based mental health screenings have detected a significant proportion of adolescents screened positive for depression in particular. The current study findings on prevalence rate are comparable to those in the West. They do not conform to the notion that the Chinese population is traditionally conceptualized as having a tendency to somatize depressive symptoms (Kleinman, 2004). This discrepancy warrants further investigation.

Depression

As a significant proportion of suicidal individuals exhibits depressive symptoms, it is of utmost importance that such cases be subjected to diagnostic interviews by trained mental health professionals. A system should be in place to ensure that such individuals be linked up with medical and social services for continual follow-up.

Problems that are comorbid with depression

Another complication of depression lies in its comorbidity. It goes hand-in-hand with other mental disorders or symptoms such as anxiety and eating disorders. Again, the current findings support this phenomenon, that is, a significant proportion of students exhibited trait anxiety and body dissatisfaction. As a matter of fact, inter-

correlations are found among these variables. In particular, research findings have pointed to a bi-directional relationship between depression and body dissatisfaction (Presnell et al, 2009). The current findings also indicate a gender difference in the mechanism behind body dissatisfaction. For boys, body dissatisfaction may stem mainly from high BMI, which is a physical measure.

However, for girls, the main predictors of body dissatisfaction seem to be cognitively-based, giving rise to anxiety and depressed mood. Hence, gender-differential interventions must be implemented for optimal results. An integrated approach should be adopted for school-based screenings. It should target various mental health disorders that are prevalent and debilitating for adolescents. They are depression, anxiety, eating disorders and psychotic disorders. Physical health screenings should also be implemented in order to shed light on the student's overall well-being and corresponding support/intervention.

Self-efficacy

Another useful finding relates to students' academic performance and self-efficacy. Numerous studies have attested to the positive effect of interventions targeted to increase self-efficacy in students (Mann, Smith & Kristjansson, 2015; Sewell & St George, 2000). Increased self-efficacy has been found to be associated with several positive outcomes. They include increased academic performance, decreased mathematics anxiety, fewer behavioral problems and high-risk behaviours. As indicated in this study, increased self-efficacy may also contribute to a decrease in body dissatisfaction. Thus, the benefits of increasing self-efficacy are multifold. Self-efficacy interventions can be implemented at student or teacher level.

Student-level interventions involve teaching students ways to increase self-efficacy. Through teaching and indirectly through modeling and cooperative training, problem-solving skills and learning strategies can be enhanced (Margolis & McCabe, 2006). Student self-efficacy can also be increased indirectly through training teachers the relevant techniques and strategies to enhance self-efficacy in students (Siegle & McCoach, 2007). Minor changes to teachers' instructional style may lead to considerable increases in students' self-efficacy. Teachers can be trained through intensive workshops on pedagogies that give rise to increased self-efficacy. These pedagogies include (1) praising students on effort and progress, (2) giving frequent and specific feedback, (3) emphasizing recent successes, (4) empowering students through small successes/breaking down the task into small steps (5) decreasing feelings of inferiority and competition through jigsaw group work or buddy system, (6) encouraging adoption of learning-oriented as opposed to performance-oriented goals and (7) designing class activities that enables enactive learning.

Follow-up actions should be implemented in order to further improve students' physical as well as psychological health. Conclusions drawn will have public health implications and shed light on the need for early intervention as well as prevention

measures. Above all, in-depth findings based on nation-wide data will contribute to establishing a national Health Quality Assessment Indicators as stipulated by The Ministry of Education. Achieving the objectives set by The Ministry to foster physical and mental health education will be recognized as a milestone and best-practice model in public health management.

Limitations and Future Research

Owing to limitation in respect of scope of research and sample size, this study should be considered to be a pilot project. Results obtained did inform future directions on intervention. Since the data were obtained from a prestigious school, results may not be generalizable to the whole population or other Chinese communities. In the final analysis, comprehensive studies of the mental health of students should be supported by counselling, guidance and relevant services. As this study is cross-sectional in design, causality claims cannot be established. However, the main purpose of this study is to provide preliminary findings, specifically the prevalence of adolescent health problems in Mainland China. Other factors related to depression such as social support from parents, peers and family, may be further explored in future studies. Prevention is as equally important as intervention. However, it is beyond the scope of this investigation. For future research, the current study should be replicated in other schools in Beijing longitudinally, in order to lend support to the generalizability and robustness of findings. School-based interventions should be carefully designed and implemented. Randomized-controlled trials should be adopted in order to accurately assess intervention effectiveness.

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