



Hygiene and mental health among middle school students in India and 11 other countries



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Abstract The Global School-based Student Health Survey (GSHS) collects data from early adolescents who are approximately 13–15 years old and enrolled in middle schools (also known as junior secondary schools). We used logistic regression models to examine the associations between self-reported hygiene practices and mental health status as assessed by the 2007 India GSHS. Then, we used meta-analysis to compare the results from India with those from 11 other GSHS-participating countries in Asia and Africa (Djibouti, Indonesia, Jordan, Kenya, Lebanon, Myanmar, the Philippines, Tanzania, Thailand, Uganda, and the United Arab Emirates). Among 7904 middle school students in India, 25.5% reported symptoms of depression, 8.6% reported loneliness, and 7.8% reported anxiety-related insomnia. Both males and females who reported symptoms of depression had an increased likelihood of poor hand and oral hygiene, including washing their hands rarely or never and brushing their teeth less than daily. The meta-analysis for this association yielded statistically significant pooled odds ratios for both boys and girls. In girls, loneliness was also associated with poor hand and oral hygiene. Reduced mental health status in adolescents may lead to worse hygiene behaviors and an increased risk of infections. Teachers, parents, healthcare workers, and other adults who observe suboptimal hygiene status in an adolescent should consider whether this indicates a mental health issue that requires clinical services.

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Introduction

Clean hands, faces, bodies, and teeth can significantly improve health status and reduce the risk of infection [1]. Hand-washing is an effective primary prevention method for reducing the incidence of diarrhea and respiratory infections, including influenza [1,2]. An estimated one million annual infectious disease deaths worldwide could be averted by improved hand hygiene practices [3]. Personal body and facial hygiene also reduce the risk of skin infections and trachoma, a bacterial infection that can cause incurable blindness [1]. Dental hygiene reduces the risk of dental caries and periodontal disease, which are associated with oral and cardiovascular health as well as overall well-being [4,5]. Oral hygiene may also reduce the risk of respiratory tract infections [6]. Hygiene behaviors may also be linked to mental health status, as previous studies have found that psychological distress, low self-esteem, and unhappiness are associated with poor personal hygiene [7–10].

The World Health Organization defines health as “a state of complete physical, mental, and social wellbeing, and not merely the absence of disease or infirmity” [11], and any condition that impairs physical, mental, or social health reduces both individual well-being and the well-being of communities. Previous studies have highlighted the connections between hygiene and physical health and between hygiene and social health. The link between hygiene and psychological health has been less frequently studied. The aim of this analysis was to examine the associations between mental health and hygiene behaviors among middle school (sometimes called junior secondary or intermediate school) students who participated in the Global School-based Student Health Survey (GSHS). Reduced mental health status in adolescents may lead to unfavorable hygiene behaviors and an increased risk of infections.

Methods

The GSHS is conducted by low- and middle-income countries (LMICs) in collaboration with the U.S. Centers for Disease Control and Prevention (CDC) and World Health Organization. All of the countries that participate in the GSHS follow a standard protocol for ethics approval, sampling, surveying, and data management, and all of these countries select survey items from the same validated questionnaire bank. A two-stage cluster sampling design is used. In the first stage of the 2007 India GSHS, 75 Central Board of Secondary Education (CBSE) schools

with students in grades that typically include 13- to 15-year-olds—those in classes (grades) 8, 9, and 10—were randomly sampled from across the country. The CBSE is an examining board that oversees student assessment at most public (government-run) and private secondary schools. In the second stage, classrooms from classes 8, 9, and 10 that were within the sampled schools were randomly sampled, and all students in these classrooms were invited to volunteer to complete an anonymous self-report survey during school hours. In total, 74 of the 75 sampled schools participated (99%), and 8130 (85%) of the students from the sampled classrooms responded to the survey. To ensure the confidentiality of shared information and the privacy of the participants, no information about the participating schools (such as the state in which the school is located, whether it is in a rural or urban setting, the total number of enrolled students, or whether the school is public or private) was included in the public dataset.

This analysis focuses on the association between hygiene and mental health. The questions ‘During the past 30 days, how often did you wash your hands after using the toilet or latrine?’ and ‘During the past 30 days, how many times per day did you usually clean or brush your teeth?’ were used to assess hygiene behaviors. The hand washing question had a 5-point frequency response scale. Students who reported washing their hands ‘rarely’ or ‘never’ (rather than ‘sometimes’, ‘most of the time’, or ‘all of the time’) after using the toilet were considered to be engaging in high-risk hygiene behaviors due to not engaging in adequate hand washing practices. The tooth brushing question had possible responses of ‘I did not clean or brush my teeth during the past 30 days’, ‘less than 1 time per day’, ‘1 time per day’, ‘2 times per day’, ‘3 times per day’, and ‘4 or more times per day’. Students who reported brushing their teeth less than 1 time daily during the past month—those never brushing or cleaning their teeth during the past month and those who reported brushing less frequently than daily—were categorized as having high-risk hygiene behavior due to poor oral hygiene.

Three questions about the symptoms of depression, anxiety, and loneliness were indicators of mental health status. ‘During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing your usual activities?’ was an indicator of symptoms of depression and had possible responses of ‘yes’ and ‘no’. ‘During the past 12 months, how often have you been so worried about something that you could not sleep at night?’ was an indicator of anxiety, and ‘During the past 12 months,

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