

# Comparative Analysis of Health Behaviors and Protective Factors in Students Attending International Schools and Government Schools across India

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**Abstract** The World Health Organization (WHO) conducted a self-administered global school-based student health survey (GSHS) in 2007 to students attending schools under the Indian Central Board of Secondary Education (CBSE). The survey collected data on various health behaviors; however, this sample of data was missing a large proportion of Indian children attending government schools (GS). The objective of this study is to compare health behaviors and protective factors between CBSE and GS students in India. Children attending nine randomly selected GS in Bangalore, India were orally surveyed using questions from the GSHS. While dietary and hygiene factors are compromised for students in GS, they appear to engage in healthy social relationships more often than CBSE students. These dissimilarities between GS and CBSE schools imply that the gap in health factors between the two school systems remain a complex problem and that school-type specific solutions are required to address these issues.

**Keywords:** world health organization, central board of secondary education, interpersonal relations, malnutrition, hand hygiene

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## 1. Introduction

The education system in India is comprised of two distinct types of schools. The Central Board of Secondary Education (CBSE) in India largely funds and regulates most of India's public and private schools. Nevertheless, a large portion of Indian schools are not funded through the CBSE. These schools, called government schools (GS), are mostly state funded. While CBSE schools are similar to American schools in the quality of education provided, government schools lack the resources to provide an adequate education for their students [1]. These GS are usually instituted in underdeveloped areas of India that are often underrepresented by the government in published educational statistics [2].

The World Health Organization (WHO) conducted a global school-based student health survey (GSHS) in 2007. As a part of their study, the WHO collaborated with the CBSE to compare certain lifestyle factors between 8,130 male and female Indian students ages 13 to 15 attending CBSE schools [3]. The purpose of this investigation was to determine the physical and emotional wellbeing of students in India, with the end goal to improve the lifestyle of school children in India. Specifically, the WHO investigated among CBSE students dietary

behaviors, drug use, hygiene, mental health, physical activity, protective factors, sexual behavior, alcohol use, tobacco use, and violence and unintentional injury.

However, because the WHO studied only schools under the CBSE, it is possible that the data does not reflect the majority of Indian school children. In fact, study censuses have determined that between 41% and 86% of schools in certain Indian cities are considered unrecognized GS [4,5]. Consequently, the objective of this study was to conduct a similar study to the WHO GSHS with GS students to examine differences in the health behaviors and protective factors between CBSE and GS students.

Specifically, the study presented in this paper examines various factors associated with hygiene, diet, and social health risks and compares the results obtained from government schools with those the WHO observed in CBSE schools. Ultimately, with this knowledge in hand, a more accurate depiction of the health status of all children in India can be developed.

## 2. Methods

A modified version of the WHO GSHS was used. The GSHS is a validated questionnaire that has been used in many published studies to measure important health behaviors and protective factors among students [6,7]. The

survey was modified suitably to fit the context and population of the study. Socio-demographic variables such as age, gender, and occupation of the students' parents and categorical variables on student knowledge, attitudes, and various health behaviors were collected. The categorical variables were five point Likert scale items with the responses of: never, rarely, sometimes, most likely and always (Appendix 1).

A survey was conducted in nine rural schools in Southern India. The schools were randomly selected from a list of one-hundred GS adopted by the Doctors for Seva program in Bangalore, India. Fifteen students, ranging from ages eleven to sixteen, from each school were randomly selected to participate in the survey. Surveys were presented orally to consenting students by the principal investigator and trained research assistants who were conversant in the local dialect. Data collection took place over a two-month period between June and July of 2012. Data from paper surveys were entered into statistical software for analysis.

Data analysis included descriptive statistics and t-tests to examine gender differences in various health behaviors and attitudes. Chi-square tests of association were run to examine associations of social support. In addition, linear correlations were used to examine correlation among the social support variables. All tests of significance were two-sided ( $p < 0.05$ ). All statistical tests were conducted using SPSS v.21 (IBM, Inc.).

Approval for this study was obtained from the ethics committee of the local non-governmental organization Doctors of Seva, which regularly conducts health camps for rural children studying in these schools.

### 3. Results

Ages of the students ranged from 11 to 16 years old. The mean age for students was  $13.448 \pm 1.239$  years old. From a sample size of 96 students, 35.4% of the students were female and 64.6% were males. The majority of the GS students' mothers were un-skilled workers, and the majority of fathers were skilled workers. Almost none of the parents held semi-professional or professional occupations (Table 1).

**Table 1. Distribution of occupations of parents of GS students (n = 96)**

Occupation	Mothers (Percent %)	Fathers (Percent %)
Un-skilled	61.9	11.5
Semi-skilled	15.2	27.6
Skilled	19.6	57.5
Semi-professional	3.3	2.3
Professional	0.0	1.1

**Table 2. Distribution of fruit consumption by GS students (n = 96)**

Fruit consumption (per day)	Percent (%)
Three (3)	5.2
Twice (2)	9.4
Once (1)	35.4
Less than once (<1)	37.5
Do not eat fruit	12.5

**Table 3. Distribution of hand-washing and soap-using habits of GS students (n = 96)**

Frequency	Washed hands (%)	Used soap (%)
Always	88.5	12.5
Mostly	2.1	3.1
Sometimes	5.3	56.3
Rarely	1.0	17.7
Never	3.1	10.4

Many GS students ate fruit less than once a day as shown in Table 2. As shown in Table 3, the majority of the GS students reported that they always washed their hands but only sometimes used soap. There was a significant association between female students and washing hands before meals ( $p = 0.01$ ) (Table 4).

Students whose parents consumed alcohol were more likely to miss one or more classes on purpose in the past 30 days ( $p = 0.01$ ), though there was a non-significant association between parental tobacco consumption and missing class ( $p = 0.13$ ).

18% of GS students said they had at least one close friend and more than 50% of GS students said they had three or more close friends. There was no association between bullying and gender ( $p = 0.966$ ) within the GS students.

**Table 4. Comparison of health factors between genders of students attending GS (n = 96).**

	Male	Female
<b>Personal hygiene</b>		
Wash hands before meals in the past 30 days	4.71 (0.81)	4.97 (0.17)
Wash hands after using the toilet in the past 30 days	4.63 (0.98)	4.88 (0.54)
Wash hands with soap after using toilet in the past 30 days	2.92 (1.18)	2.85 (0.79)
<b>Social and family support</b>		
Classmates kind and helpful in the past 30 days	4.05 (1.18)	4.55 (0.86)
Parents understood problems and worries in the past 30 days	3.66 (1.57)	4.42 (1.11)
Felt lonely in the past 12 months	1.68 (1.01)	2.15 (1.25)
Lost sleep due to excessive worrying in the past 12 months	2.02 (1.22)	2.12 (1.16)
<b>Parental involvement</b>		
Parents checked homework in the past 30 days	3.43 (1.81)	3.18 (1.91)
Parents aware of free time activities in the past 30 days	3.87 (1.53)	4.22 (1.40)

**Table 5. Comparison of health factors between GS and CBSE schools (n = 96). Source for CBSE data: 2007 India (CBSE) GSHS Results<sup>8</sup>**

Survey Topic	International School (%)	Government School (%)
Percentage of students who ate fruit less than once (<1) per day	22.10	37.50
Percentage of students who have not had vegetables in the past fifty (50) days	2.00	12.63
Percentage of students who always wash their hands after toileting	43.30	12.00
Percentage of students who have never felt lonely	34.80	59.38
Percentage of students whose fathers use tobacco	15.60	51.04
Percentage of students who have missed more than ten (10) days of school without permission in the last month	1.20	7.28
Percentage of students who feel their peers are nice and helpful	20.90	57.28
Percentage of students whose parents always understood their problems	32.90	57.89

Parents of GS students who were responsive to their children's problems were more likely to check if their children completed their homework on time ( $r = 0.25$ ,  $p = 0.01$ ) (Table 4). GS parents who supervised their children's free time were also more likely to check if their homework was done on time ( $r = 0.22$ ,  $p = 0.03$ ). There was also a small positive correlation in GS students between feeling lonely in the past 12 months and having to lose sleep due to excessive worry in the past 12 months ( $r = 0.22$ ,  $p = 0.02$ ).

#### 4. Discussion

The data collected from the students in GS was compared to the data from the 2007 WHO study on CBSE schools. Similar questions from both studies were compared and summarized in Table 5.

Students in GS appear to fare worse than those in CBSE schools with regard to nutrition and hygiene. Students who attend GS consume fruits and vegetables less frequently than CBSE students. Furthermore, more students in CBSE schools always wash their hands after toileting as compared to those in GS. Ultimately, the WHO's GSHS largely overestimated the physical health state of all schoolchildren in India by solely focusing on CBSE schools.

Contrastingly, GS students seem to have better relationships with their peers and family. GS students feel lonely less often than CBSE students. Additionally, GS students feel more comfortable with their peers and consider them nice and helpful more often than CBSE students. GS students also maintain more understanding relationships and arguably closer connections with their parents. Interestingly, it was noted that fathers of GS students use tobacco more frequently than fathers of CBSE students, suggesting that parent relationships may also hold detriments to the health of GS schoolchildren.

While dietary and hygiene factors are compromised for students in GS, they appear to engage in healthy social relationships more often than CBSE students. These dissimilarities between GS and CBSE imply that the gap in health factors between the two school systems remain a complex problem. Although the results obtained from the WHO can provide some basis for solutions to health issues in schools under the CBSE, they may not necessarily apply to GS. Ultimately, the WHO should expand their GSHS to GS as well as CBSE schools to

fully understand the health conditions affecting all students. As shown in this study, specific school-type-directed approaches should be taken to improve the physical and social health of students in India.

#### 5. Conclusion

The existence of two different educational systems in India reveals unique circumstances for Indian school children. A better understanding of these circumstances can be achieved with a more inclusive survey targeting students within both systems. However, since Indian children attending CBSE schools and GS have such varied experiences in health education and social relationships, steps should be taken to individually address the health gaps faced by these students. Additional studies can be conducted focusing on effective solutions and best methods to apply those solutions within both school systems. In conclusion, developing a more accurate picture of the health status of Indian students will lead to improvements in their overall well-being.

#### References

- [1] Lall, M. The challenges for India's education system. London, United Kingdom. Chatham House: Asia Programme. 2005. Available at: <http://www.chathamhouse.org/sites/default/files/public/Research/Asia/bpindiaeducation.pdf>.
- [2] Kingdon, GG. Private schooling in India: size, nature, and equity effects. *Economic and Political Weekly*. 1996; 31 (51): 3306-14.
- [3] Parashar, S. 2007 India (CBSE) global school-based health survey. New Delhi, India. World Health Organization. Available at: [http://www.who.int/chp/gshs/2007\\_India\\_CBSE\\_fact\\_sheet.pdf](http://www.who.int/chp/gshs/2007_India_CBSE_fact_sheet.pdf).
- [4] Aggarwal, Y. Public and private partnership in primary education in India: a study of unrecognized schools in Haryana. New Delhi, India. National Institute for Educational Planning and Administration. 2000. As quoted in: [http://www.dise.in/Downloads/Use%20of%20Dise%20Data/Geeta%20Gandhi%20Kingdon\\_1.pdf](http://www.dise.in/Downloads/Use%20of%20Dise%20Data/Geeta%20Gandhi%20Kingdon_1.pdf).
- [5] Mehta, AC. Elementary education in unrecognized schools in India: a study of Punjab based on 2005 DISE data. New Delhi, India. National Institute for Educational Planning and Administration. 2005. Available at: <http://www.dise.in/Downloads/Reports&Studies/HYPERLINK> <http://www.dise.in/Downloads/Reports&Studies/UnRecPunjab05.pdf> & [HYPERLINK "http://www.dise.in/Downloads/Reports&Studies/UnRecPunjab05.pdf"](http://www.dise.in/Downloads/Reports&Studies/UnRecPunjab05.pdf)Studies/UnRecPunjab05.pdf.

- [6] Global school-based student health survey. New Delhi, India. Center for Disease Control. 2011. Available at: <http://www.cdc.gov/gshs/pdf/GSHSOVerView.pdf>. 2006 India Central Board of Secondary Education (CBSE) GSHS questionnaire. New Delhi, India. Center for Disease Control. 2006. Available at: [http://www.who.int/chp/gshs/2006\\_India\\_GSHS\\_Questionnaire\\_English.pdf](http://www.who.int/chp/gshs/2006_India_GSHS_Questionnaire_English.pdf).
- [7] 2007 Global school-based student health survey results: public use codebook. New Delhi: Center for Disease Control. 2007. Available at: [http://www.who.int/chp/gshs/IIH2007\\_public\\_use\\_codebook.pdf](http://www.who.int/chp/gshs/IIH2007_public_use_codebook.pdf).

## Appendix 1

Note: numbers listed next to each answer refers to the answer represented during statistical analysis of categorical variables

GSHS Core Questionnaire Dietary Behaviors Module

**During the past 30 days, how often did you go hungry because there was not enough food in your home?**

Never-1

Rarely-2

Sometimes-3

Most of the time-4

Always-5

**During the past 30 days, how many times per day do you usually eat fruit, such as [insert COUNTRY SPECIFIC EXAMPLES of fruit]?**

I did not eat fruit during the past 30 days-1

Less than one time per day-2

1 time per day-3

2 times per day-4

3 times per day-5

4 times per day-6

5 or more times per day-7

**During the past 30 days, how many times per day do you usually eat vegetables, such as [insert name of COUNTRY SPECIFIC EXAMPLES of vegetables]?**

I did not eat vegetables during the past 30 days-1

Less than one time per day-2

1 time per day-3

2 times per day-4

3 times per day-5

4 times per day-6

5 or more times per day-7

**During the past 30 days, how many times per day do you drink carbonated soft drinks such as [insert name of locally available carbonated soft drink]?**

I did not drink carbonated soft drinks during the past 30 days-1

Less than 1 time per day-2

1 time per day-3

2 times per day-4

3 times per day-5

4 times per day-6

5 or more times per day-7

GSHS Core Questionnaire Hygiene Module

**During the past 30 days, how many times per day do you usually clean or brush your teeth?**

I did not clean or brush my teeth during the past 30 days-1

Less than 1 time per day-2

1 time per day-3

2 times per day-4

3 times per day-5

4 or more times per day-6

**During the past 30 days, how often did you wash your hands before eating?**

Never-1

Rarely-2

Sometimes-3

Most of the time-4

Always-5

**Where do you go to use the toilet ?**

Do you have an indoor toilet in your home?-1

An outdoor toilet?-2

Do you urinate outdoors in a field?-3

**During the past 30 days, how often do you usually wash your hands after using the toilet or latrine?**

Never-1

Rarely-2

Sometimes-3

Most of the time-4

Always-5

**During the past 30 days, how often do you usually use soap when washing your hands?**

Never-1

Rarely-2

Sometimes-3

Most of the time-4

Always-5

GSHS Core Questionnaire Protective Factors Module

**During the past 30 days, on how many days did you miss classes or school without permission?**

0 days-1

1 or 2 days-2

3 to 5 days-3

6 to 9 days-4

10 or more days-5

**During the past 30 days, how often were most of the students in your school kind and helpful?**

Never-1

Rarely-2

Sometimes-3

Most of the time-4

Always-5

**During the past 30 days, how often did your parents or guardians check to see if your homework was done?**

Never-1

Rarely-2

Sometimes-3

Most of the time-4

Always-5

**During the past 30 days, how often did your parents or guardians understand your problems and worries?**

Never-1

Rarely-2

Sometimes-3

Most of the time-4

Always-5

**During the past 30 days, how often did your parents or guardians really know what you were doing with your free time?**

Never-1

Rarely-2

Sometimes-3

Most of the time-4

Always-5

GSHS Core Questionnaire Mental Health Module

**During the past 12 months, how often have you felt lonely?**

Never-1

Rarely-2

Sometimes-3

Most of the time-4

Always-5

**During the past 12 months, how often have you been so worried about something that you could not sleep at night?**

Never-1

Rarely-2

Sometimes-3

Most of the time-4

Always-5

**How many close friends do you have?**

- 0-1
- 1-2
- 2-3
- 3 or more-4

GSHS Optional Core Module for Countries That Cannot Ask Sexual Behaviour Questions

**1. Have you ever heard of HIV infection or the disease called AIDS?**

- Yes-1
- No-2

**2. During this school year, were you taught in any of your classes about HIV infection or AIDS?**

- Yes-1
- No-2
- I do not know-3

**3. During this school year, were you taught in any of your classes how to avoid HIV infection or AIDS?**

- Yes-1
- No-2
- I do not know-3

**4. Have you ever talked about HIV infection or AIDS with your parents or guardians?**

- Yes-1
- No-2

GSHS Core Questionnaire Alcohol Use Module

**How old were you when you had your first drink of alcohol other than a few sips?**

- I have never had a drink of alcohol other than a few sips-1
- 7 years old or younger-2
- 8 or 9 years old-3
- 10 or 11 years old-4
- 12 or 13 years old-5
- 14 or 15 years old-6
- 16 years old or older-7

**During the past 30 days, on how many days did you have at least one drink containing alcohol?**

- 0 days-1
- 1 or 2 days-2
- 3 to 5 days-3
- 6 to 9 days-4
- 10 to 19 days-5
- 20 to 29 days-6
- All 30 days-7

**During the past 30 days, how did you usually get the alcohol you drank? SELECT ONLY ONE RESPONSE.**

- I did not drink alcohol during the past 30 days-1
- I bought it in a store, shop, or from a street vendor-2
- I gave someone else money to buy it for me-3
- I got it from my friends-4
- I got it from my family-5
- I stole it or got it without permission-6
- I got it some other way-7

**During your life, how many times have you got into trouble with your family or friends, missed school, or got into fights, as a result of drinking alcohol?**

- 0 times-1
- 1 or 2 times-2
- 3 to 9 times-3
- 10 or more times-4

GSHS Core Questionnaire Drug Use Module

**How old were you when you first used drugs?**

- I have never used drugs-1
- 7 years old or younger-2
- 8 or 9 years old-3
- 10 or 11 years old-4
- 12 or 13 years old-5
- 14 or 15 years old-6
- 16 years old or older-7

**During your life, how many times have you used marijuana?**

- 0 times-1
- 1 or 2 times-2
- 3 to 9 times-3
- 10 to 19 times-4
- 20 or more times-5

## GSHS Core Questionnaire Tobacco Use Module

**How old were you when you first tried a cigarette?**

- I have never smoked cigarettes-1
- 7 years old or younger-2
- 8 or 9 years old-3
- 10 or 11 years old-4
- 12 or 13 years old-5
- 14 or 15 years old-6
- 16 years old or older-7

**During the past 30 days, on how many days did you smoke cigarettes?**

- 0 days-1
- 1 or 2 days-2
- 3 to 5 days-3
- 6 to 9 days-4
- 10 to 19 days-5
- 20 to 29 days-6
- All 30 days-7

**During the past 12 months, have you ever tried to stop smoking cigarettes?**

- I have never smoked cigarettes-1
- I did not smoke cigarettes during the past 12 months-2
- Yes-3
- No-4

**Which of your parents or guardians use any form of tobacco?**

- Neither-1
- My father or male guardian-2
- My mother or female guardian-3
- Both-4
- I do not know-5

## GSHS Core Questionnaire Violence and Unintentional Injury Module

**During the past 12 months, how many times were you physically attacked?**

- 0 times-1
- 1 time-2
- 2 or 3 times-3
- 4 or 5 times-4
- 6 or 7 times-5
- 8 or 9 times-6
- 10 or 11 times-7
- 12 or more times-8

**During the past 12 months, how many times were you seriously injured?**

- 0 times-1
- 1 time-2
- 2 or 3 times-3
- 4 or 5 times-4
- 6 or 7 times-5
- 8 or 9 times-6
- 10 or 11 times-7
- 12 or more times-8

**During the past 12 months, what was the most serious injury that happened to you?**

- I was not seriously injured during the past 12 months-1
- I had a broken bone or a dislocated joint-2
- I had a cut or stab wound-3
- I had a concussion or other head or neck injury, was knocked out, or could not breathe-4
- I had a gunshot wound-5
- I had a bad burn-6
- I was poisoned or took too much of a drug-7

Something else happened to me-8

**During the past 12 months, what was the major cause of the most serious injury that happened to you?**

I was not seriously injured during the past 12 months-1

I was in a motor vehicle accident or hit by a motor vehicle-2

I fell-3

Something fell on me or hit me-4

I was attacked or abused or was fighting with someone-5

I was in a fire or too near a flame or something hot-6

I inhaled or swallowed something bad for me-7

Something else caused my injury-8

I was raped-9

GSHS Core Questionnaire Violence and Unintentional Injury Module

**During the past 30 days, on how many days were you bullied?**

0 days-1

1 or 2 days-2

3 to 5 days-3

6 to 9 days-4

10 to 19 days-5

20 to 29 days-6

All 30 days-7

**During the past 30 days, how were you bullied most often?**

I was not bullied during the past 30 days-1

I was hit, kicked, pushed, shoved around, or locked indoors-2

I was made fun of because of my race, nationality, or color-3

I was made fun of because of my religion-4

I was made fun of with sexual jokes, comments, or gestures-5

I was left out of activities on purpose or completely ignored-6

I was made fun of because of how my body or face looks-7

I was bullied in some other way-8



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