

# MEDIATORS OF UNIVERSITY STUDENTS 'SELF-RATED HEALTH STATUS: A STUDY IN JAHANGIRNAGAR UNIVERSITY

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**Abstract:** Self-rated health status (SRHS) is a reliable and valid measure for assessing the subjective health of individuals. University students' physical health's are important and comprise many variables. This study assessed perceived health status of 303 students from Jahangirnagar University, Dhaka, Bangladesh. Of 303 students, about 65% students rated their health as healthy while 35% rated as unhealthy. Majority of the student's (about 70%) bears a standard body mass index ( $kg/m^2$ ) where as 30% are not standard (19.5% are under weight and 9.5% are over-weight). About 42% student mentioned their mental health condition as strong and 58% as weak. Logistic regression analyses revealed that age, female status, low level of Mother's education, weak mental health and under/over-weight were associated with lower self-rated health. The results suggest that SRHS can be reasonably used to compare students' health across countries.

**Keywords:** Self-rated health, physical health, psychological indicators and health awareness.

## 1. Background

Assessments of physical health are traditionally measured by health care professionals in ways that are different from individuals' self-ratings. In the biomedical model, physical health is explained in terms of a body-machine framework; structure and function of tissues and organs. For the health care professional, physical health is a body as machine problem; for the individual, it is a soma-psyche interaction through one's thoughts, feelings and behaviors in relation to physical experiences. One of the most commonly used measures of perceived physical health status consists of a single

Likert-type scale item, querying about respondents' overall health. Various studies have shown this measure to be one of the best predictors of health care utilization.

Asking for a Self-rated health (SRH) is a legitimate technique for assessing the health of individuals [1]. While self-rating of health is a good measure of objective and subjective health [2], it is also a feasible way to measure health in large-scale surveys [3,4]. Self-rating of health has been shown to have high reliability, validity and predictive power for a variety of illnesses and conditions [5]. Self rated health has been extensively studied in older adult population groups, where a range of factors associated with self-rated health has been identified [6-8]. Much less is known about the self-rated health of younger populations. An exception is the international "Health Behavior in School-Aged Children" study which contributed to the understanding of factors associated with self-rated health in school-aged children [9,10]. However, for young adults (e.g. university students) the available information remains limited in scope. University students represent the future of families, communities, and countries. They also face the stresses of achieving success in their academic goals. University is a period of increased responsibility for choices and healthy practices. On the one hand, university students have concerns, burdens and worries which are different from other population groups. On the other hand, these students face the dual stress of having academic challenges and achievements often within the face of financial limitations [11,12]. Hence

unsurprisingly, in Sweden students were found to have lower perceived quality of life when compared with their working peers [13], and similar observations have been reported in the UK [14]. The published literature also suggests that young people preferentially employ psychological or behavioral factors as a rating frame for their health [3,15,16]. In contrast, for older people, physical well-being plays a more crucial role in assessing their health [3,8]. Given the observation that young adults differ from older people in their perception of health, a better understanding and a separate analysis of the factors associated with self-rated health status (SRHS) is needed for this younger age group. This is particularly true for university students, who represent an important and broad subpopulation of young adults.

It is far more difficult for adults to change unhealthy habits adopted in their youth. If health professionals are to enhance health-promoting behaviors and well-being in the community, then health promoting efforts should be targeted at young people. Many of the factors that contribute to health risks in older adults are preventable if identified and changed at an early stage. Early interventions can alter behavior patterns that would place young people at health risk in later life [17, 18]. Promotion of healthy behaviors among young people is therefore essential.

Numerous studies have been conducted in the West to explore the determinants of health status and health-promoting behaviors among different population groups, including young mothers [19], adults [20], and the elderly women [21]. This study seeks to examine the health behaviors and psychosocial well-being of Chinese young adults in Hong Kong. The associations of educational satisfaction, health, health behaviors, health complaints and financial parameters with the outcomes of educational achievement did not differ between male and female students [22].

The present study is an attempt in the direction of health status of the university student with the objectives are to discover the health status and related socio-economic characteristics of the student, to determine

the significance of different factors of health among the students and to develop a model based on different variables for estimating the parameter using logistic regression model.

First section in this study discussed the background information on the status of health among student. It also argued for an increased focus on the issue and outlined the two research questions that guide this master's research project. Section two describes the methodology of the study. Next section includes an analysis of the research and its findings while last section summarizes and presents conclusions on the current status of health among students as well as implication for action and additional research.

## 2. Methods

### *Study Design and sample*

The target population of the study is the university level students in Bangladesh. The Data were collected from Jahangirnagar University, Savar, Dhaka, Bangladesh. The sites were chosen on the basis of research interests. During August 2011 and December 2011, data were collected through self-administered questionnaires. The primary data were collected by using Simple Random Sampling design. From a pilot survey, it was found that around 70% of the students ( $p = 0.70$ ) rated their health as healthy, considering 5% alpha level ( $z_{0.025} = 1.96$ ) and 5% acceptable error margin ( $d = 0.05$ ), the desired sample size had been estimated by Cochran's formula ( $n = z^2 p(1-p)/d^2$ ) as 322. We interviewed 322 students but 19 questionnaires were found incomplete after editing so we deducted those from analysis. So our final sample remained 303.

### *Questionnaire*

The study was a general student health survey. It included socio-demographic information, self-reported health data, as well as questions on health awareness, and university study related questions. A self-administered questionnaire was utilized for data collection. It was constructed by the researcher after a robust review of literature.

### *Statistical Analysis*

Descriptive statistics were performed using tabulations on various aspects. We investigated bivariate relationships between SRHS and its potential predictive variables using  $\chi^2$  analyses. More in-depth analyses were also performed to further investigate the many complex processes and relationships that affect an individual's SRHS using logistic regression. Initially, all variables significantly associated with SRHS in the bivariate analysis were included in the main effects model. This model was then reduced in a stepwise process using likelihood ratio test criterion using the 5.0% level of significance.

Logistic regression has been used extensively in epidemiological modeling. Logistic regression provides a way of modeling the response error distribution that may not be normally distributed and allow for a relationship between the binary occurrence and factors to be formulated in an understandable and easily interpretable manner. Logistic regression models are statistical models in which an evaluation is made of the relationship between a dependent qualitative, dichotomy variable (binary or binomial logistic regression) or variable with more than two values (multinomial logistic regression) and one or more independent explanatory variables, or co-variables, whether qualitative or quantitative.

There are three methods of performing a logistic regression: (1) all possible selection, (2) forward stepwise selection and (3) backward elimination, however, the forward stepwise selection was used in this study because it has been found to be useful in explanatory model building. Logistic regression uses the log likelihood (LL) to specify the probability that the observed dependent values may be predicted from the observed independent values. It is also called goodness of fit, deviance chi-square, scaled deviance, deviation chi-square or L-square. The LL ratio (-2LL) has approximately a chi-square distribution, thus, it can be used to assess the significance of logistic regression

model. The likelihood ratio is not used directly in significance testing, but it is the basis upon which the test of the difference between the null and the tested likelihood ratios (two -2LL's) is assessed. The degrees of freedom (df) in this test equal the number of terms in the model minus 1 (for the constant). To assess the significance of the model, the difference between -2LL for the full model and -2LL for initial chi-square in the null model is used. If the difference is below the critical value in the chi-square table, then the model is not significant. If the computed chi-square is equal or greater than the critical value of chi-square in a chi-square table for the given df, then the model is significant.

The objective was to model the conditional probability of a 'good' health status as compared to the conditional probability of a 'poor' health status for individuals in the population given their specific demographic and anthropometric characteristics. The objective of the model building process was to obtain a 'good fit' for the data, with the least number of predictive variables. To find the most parsimonious model, forward stepwise methods (using a P-value of 0.15 as a criterion for variable removal and 0.10 as a criterion for variable entry) were employed. The computed P-values were based on the likelihood-ratio test. After the most parsimonious main effects model was selected, the  $\chi^2$  goodness-of-fit statistic was computed to assess the fit of the model.

### **3. Results**

#### *Description of the Sample*

Altogether, 303 participants were rendered for the final Analyses of whom 70% are male students and 30% are female. The average age of the students is 22.02 years. About 53.5% of the student's average monthly family income is less than 25000 taka was as 46.5% have monthly income above 25000 taka. About 40% students spend less than 3000 taka to meet all the needs and 60% have monthly expenditure above 3000 taka. The survey data shows that 92.7% of the subjects had both parents living with them, and rest of

the students are with single parent or orphan. The analysis shows that 38.9% students have maximum two siblings and 61.1% have more than two. From 303 students, about 65% students rated their health as healthy while 35% rated as unhealthy. Of the students, about 80% are non smoker and only 20% are categorized as smoker. About 58% students do some sort of physical exercise daily and 42% students do not do any type of exercise

or sometime s negligible exercise. 85.5% student does not check their health regularly only 14.5% check their health. A very good number of student's (about 70%) body mass index ( $\text{kg}/\text{m}^2$ ) is standard where as 19.5% are under weight and 9.5% are over-weight. About 41.9% student mentioned their mental health condition as good, 38.3% as weak and 19.8 are depressed (Table 1).

**Table 1** Socio-economic variables

Variable	Category	Frequency	Percentage
Gender of the student	Female	91	30.0
	Male	212	70.0
SRHS	Healthy	107	35.3
	Unhealthy	196	64.7
Age	Below or equal 21 years	117	38.6
	Above 21 Years	186	61.4
Body Mass Index	Under or over weight	88	29.0
	Standard	215	71.0
Check Health Regularly	No	259	85.5
	Yes	44	14.5
Category of Smoking	Smoker	62	20.5
	Non-smoker	241	79.5
Sufficient Sleeping	No	87	28.7
	Yes	216	71.3
Exercise Level	Almost No exercise	127	41.9
	Some sort of exercise	176	58.1
Survival Status of Parents	Both Alive	281	92.7
	Only Father	10	3.3
	Only Mother	10	3.3
	Both Passed Away	2	.7

*Association between the variables under investigation and self rated health status in bivariate Analysis*

We have investigated health related variables with categorical response scales showed associations with gender. For instance, body mass index for male students are relatively better than females. Male students also do

more physical exercise than female students. There were also differences by mental health condition, male students are mentally strong. Table 2 demonstrates that all of the investigated variables with categorical response scales showed associations with. For instance, male students rated their health better than females. There were also differences by age, with the better health

rating by older student. Students who reported their mothers' education level higher rated their health higher than those students with lower educated or illiterate mother. Students with less number of siblings rated their health status better than students with more siblings. Physical exercise was another good indicator for self rated health status with the better health rating by the student who does some sort of physical exercise daily. Mental health condition was highly associated with self rated health status; students who were mentally strong or normal rated their health better than the students who

were mentally weak. Regular smokers rated their health lower than non smokers. Student's monthly expenditure was not associated with health. Health checking behavior was associated with better health. Body mass index was an important indicator of self rated health status of the students. Student with standard body mass index rated their health very much higher than the students with under or over weight. Daily Sufficient sleeping time was another significant indicator of self rated health status.

**Table 2** Associations between SRHS and variables scored on categorical response scales

		SRHS		Chi-Square	df	P-Value
		Poor	Good			
Gender of the student	female	75	16	17.901	1	.000
	male	121	91			
Age	Below or equal 21 years	90	27	12.493	1	.000
	Above 21 Years	106	80			
mother's education	illiterate	8	20	22.762	3	.000
	below SSC	55	31			
	SSC-HSC	105	36			
	Above	28	20			
Siblings	2 or less	64	54	9.238	1	.002
	Above 2	132	53			
Exercise status	Almost No exercise	90	37	3.655	1	.056
	Some sort of exercise	106	70			
Mental health condition	Depressed	54	6	39.970	2	.000
	Weak	84	32			
	Good	58	69			
sleeping hours is sufficient	Yes	131	85	5.371	1	.020
	No	65	22			
category of smoking	Non-smoker	162	79	3.309	1	.069
	Smoker	34	28			
check health regularly	Yes	22	22	4.860	1	.027
	No	174	85			
Student's Monthly expenditure	Less or equal 3000	82	37	1.529	1	.216
	Above 3000	114	70			
body mass index	Under weight	54	5	23.106	2	.000
	Standard	125	90			
	Over Weight	17	12			

SRHS-Self Rated Health Status

*Variables associated independently with self rated health status in multivariate Analysis*

The Parameter Estimates table (table 3), shows the logistic coefficient (B) for each

predictor variable for each alternative category of the outcome variable. The logistic coefficient is the expected amount of change in the logit for each one unit change in the predictor. The logit is what is being predicted; it is the odds of membership in the category of the outcome variable which has been specified. The closer a logistic coefficient is to zero, the less influence the predictor has in predicting the logit. The table also displays Wald statistic, *df*, Sig. (*p*-value)

and the Exp(B). The Wald test (and associated *p*-value) is used to evaluate whether or not the logistic coefficient is different than zero. The Exp(B) is the odds ratio associated with each predictor. We expect predictors which increase the logit to display Exp(B) greater than 1.0, those predictors which do not have an effect on the logit will display an Exp(B) of 1.0 and predictors which decrease the logit will have Exp(B) values less than 1.0.

**Table 3** Binary logistic regression models on self rated health status poor vs Good

	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
							Lower	Upper
Age	-.327	.100	10.560	1	.001	.721	.592	.878
Gender (Male vs Female)	.774	.377	4.224	1	.040	2.169	1.037	4.540
Mother's Education	2.244	.588	14.555	1	.000	9.434	2.978	29.885
Father's Education	-.261	.199	1.723	1	.189	.770	.521	1.138
Number of Sibling	.284	.120	5.612	1	.018	1.328	1.050	1.679
Body Mass Index	-.817	.349	5.467	1	.019	.442	.223	.876
Smoking (Smoker vs Non-Smoker)	-.108	.352	.094	1	.759	.898	.450	1.790
Daily Average Sleeping Hours	-.299	.351	.723	1	.395	.742	.373	1.477
Mental health (weak vs strong)	1.109	.298	13.849	1	.000	3.030	1.690	5.434
Weekly Average Exercise Hours	-.066	.318	.043	1	.835	.936	.502	1.746
Constant	25.876	2842	.000	1	.999	172911		

From Table 3 it is found that age of the student, gender of the student, Mother's Education Level, number of family member and Body Mass Index are the very important factors for the student health status. While Father's Education Level, Smoking Tendency of the Student, Daily Average Sleeping Hours and Weekly Average Exercise Hours do not contribute to health status of the student.

Our study shows that aged students are relatively unhealthy. We see that male student is healthier compare to their

counterpart. If a mother is educated then it is more likely that the student will be healthy, that our analysis has exposed whereas Father's education do not play any significant role. Students with greater number of siblings are expected to be more healthy compare to the student with fewer siblings. Interestingly we have found that students who do some sort of physical exercise are equally likely to be healthy over unhealthy than who do not do any such exercise. We have found same results for student daily average sleeping hour and smoking behavior.

#### 4. Discussion

The results of this study clearly show an association between socio-demographic factors and self-evaluation of good health in the university students. As found in the present study, females, in general, evaluate their own state of health lower than males do. The principal explanation given for this worse perception of health state is the role played by females in society, whereby they acknowledge pain and discomfort more easily than males do. Age is also shown to be a relevant factor. Given that the majority of illnesses are more prevalent among the elderly, self-evaluation of health usually worsens with advance of age. In the United States, results of the National Health Survey, realized in the year 2000 [33], show that 12.0% of North Americans perceive their health as "bad" or "very bad" and 64.0% evaluate their own health as "good" or "very good." The percentage of people who self-evaluate negatively is a bit larger than that obtained for the students at Jahangirnagar University, Bangladesh. The percentage of positive self-evaluation in the United States was 11 percentage points greater than that in Bangladesh. In the United States, the percentage of good self-rated health is lower for females (62.0%) than for males (66.0%), decreasing with age and socioeconomic level.

In the present analysis, the Mother's education status was, markedly, a big factor contributing to the perception of satisfactory health, as much among females as among males. In relation to the other demographic determinants of self-evaluation of good health, important differences were encountered for number of siblings. Just as the utility of self-rated health measurement is grounded in its subjective character, paradoxically, so are its limitations: hypochondriacs or people who worry a lot about health tend to self-evaluate worse than is justified by their actual states of health; aspects of individual personality, such as optimism or pessimism. The results of these

analyses indicate that students' perceptions of health are framed not only by their physical health status but also by personal, socio-environmental and behavioral factors. Not surprisingly, mental health status was the strongest predictor of self-rated health. Yet, student appraisals of their physical health status appear to be quite complex, involving several components.

The results support previous research that certain personal and socio-environmental factors increase the vulnerability of students by influencing their lifestyles and psychological distress. Moreover, these factors influence physical health ratings. Personal factors of age and sex were found to be predictive of self-rated health. Controlling for lifestyle and psychological distress increases in age became significantly associated with increases in self-rated health. At the same time, lifestyle and distress increase with age and are risk factors for self-rated health. Congruent with other research, females consistently rated their health lower than males, although the sex effect was reduced somewhat with the inclusion of lifestyle and psychological distress variables. Socio-environmental factors also have direct effects on self-rated health. Consistent with previous research, income is an important predictor of self-rated health. Yet, the effect of income was partially mediated by lifestyle behaviors and psychological distress. It is interesting to note that single-parent family structure becomes a significant predictor, with higher self rated health. Similarly, youth living alone becomes a significant predictor of self-rated health. These are intriguing findings and hard to explain. It may be that a certain resiliency exists for youth living in single parent families or alone, but this finding clearly needs more research to investigate this effect. Behavioral factors, namely smoking, physical activity and body mass weight, also influence student self-rated health. As expected, students who smoke and have higher weight rated their health lower.

However, a counterintuitive effect was found for the highest physical activity on self-rated health, whereby highly active students rated their health more poorly. Other studies focus on exercise, body image and dietary practices. However, whether or not body perceptions affect perceptions of self-rated health are unknown and a topic for further exploration. In conclusion, these findings support contention that student self-assessment of health is an active process involving general cognitive and emotional strategies for understanding the self. Self-assessments of health are based on physical health status and on non-physical determinants.

### 5. Conclusions

The study on student health has been undertaken based on primary data analysis. This study is an attempt to get some idea about the background characteristics and self-rated physical health of the students of Jahangirnagar University.

Our findings suggest that sex, daily physical exercise time, father's education, mother's education, regular health checking behavior, daily sufficient sleep and body mass index all have direct effects on self-rated physical health among the student. Interestingly, smoking tendency was not found to be a predictor of health status. It also indicated that monthly expenditure, parental survival, any vaccination taken ever did not seem to be associated with self-reported health status. Thus, these findings should be viewed as hypotheses for future research which should use a longitudinal research design in order to assess adequately the direction of causality among the factors.

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