ORIGINAL RESEARCH PAPER

Volume-8 | Issue-7 | July - 2019 | PRINT ISSN No. 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ASSESSING THE EFFECT OF PARENT'S PSYCHIATRIC HEALTH AND ENVIRONMENT ON ADOLESCENT STUDENTS USING GHQ -12

Statistics

K. E. Sadanandan Unni — Santosh Medical College Hospital, Department of Clinical Psychology , Ghaziabad

Rani Srivastava — Santosh Medical College Hospital, Department of Clinical Psychology , Ghaziabad

Alka Sabharwal* — Department of Statistics, Kirori Mal College, University of Delhi, Delhi- 110007 *Corresponding Author

Babita Goyal — Department of Statistics, Ramjas College, University of Delhi,Delhi- 110007

ABSTRACT

BACKGROUND- Parental psychiatric disorder affects several aspects of children's development, including their physical, cognitive, social, emotional, and behavioral development. School going children have been found to be affected by one or the other form of stress, anxiety and resultant depression.

OBJECTIVE- To determine effect of Parent's Psychiatric health and Environment on Adolescent Students.

METHODS- This cross-sectional study was conducted during February 2019 on adolescents' students of classes IX and XI in New Delhi, India. A total number of 256 respondents between the age-group 15-18 years were selected.

RESULTS- The effect of parent's psychiatric health is observed with total scores of GHQ (collected using bimodal) found to be significantly different as the *p*- value < 0.05 with permutation test performed on case and control groups. The effect of environment is assessed with total scores of GHQ (collected using Likert scale) are significantly different as the *p*- value< 0 .001 with permutation test and Wilcoxon test performed on private and government school students.

CONCLUSIONS- General Health Questionnaire (GHQ)-12 based on Likert scale is more sensitive to measure common and minor psychiatric disturbances than GHQ-12 based on bimodal scale, as the mean and standard deviation of each question can be computed and compared.

KEYWORDS

Adolescent, Cronbach α*,* General Health Questionnaire, Permutation *test, Wilcoxon test*

1. INTRODUCTION

Psychological disorders are common but have been recognized as serious and have long term aftereffects [1]. Under changing social scenario, every stratum of the society may be affected by one or another type of psychological disorders. Youngsters and even school going children have been found to be affected by one or the other form of stress, anxiety and resultant depression and alarmingly this number is increasing. However, the awareness about the mental issues in the society is not able to match the prevalence of these problems. In addition to the health and social costs, those suffering from mental illnesses are also victims of human rights violations, stigma and discrimination, both inside and outside psychiatric institutions. As such it is more desirable to tackle these problems in the budding stage itself and to look for them before they become chronic. The General Health Questionnaire (GHQ) devised by Goldberg (1972) is a widely used screening tool to identify common and minor psychiatric disturbances [2]. Presently there are multiple versions viz. GHQ-12, GHQ-20, GHQ-28 and GHQ-30. The original version of GHQ consisted of 60 items. The GHQ-12 is adopted as a screening tool by World Health Organization (WHO) to study psychological disorders in primary health care [3]. Nunnally and Bernstein (1998), McIver and Carmines (1981), and Spector (1992) discussed the reasons for using multi-item measures instead of a single item for measuring psychological attributes [4,5,6]. GHQ-12 is a self-administered screening questionnaire which focuses on two major areas, viz. inability to carry out normal functions and the appearance of new and distressing phenomena [7]. This tool is used for all ages starting from adolescence.

The customary type of scores used are a bi-modal scale (0-0-1- 1) and a 4-point Likert-type scale (0-1-2-3) for assessing the severity of a mental problem over the past few weeks. In bi-modal scale, the scoring method (0-0-1-1) is used to sum up the points to a total score ranging between 0 and 12. In Likert scale, each item is rated with 4 point with total score ranging from 0 to 36.The possible responses are "less than usual," "no more than usual," "rather more than usual," or "much more than usual". The 12 items questionnaire has negative and positive items (1, 3, 4, 7, and 12). The positive items are corrected from 0/0 (always) to 1/3 (never) and the negative ones from 1/3 (always) to 0/0 (never). High scores indicate bad health. To compare levels of psychiatric impairment within and between samples, this scale has been recommended by previous studies.

Sánchez-López, Maríadel Pilar, and Virginia Dreschhe(2008) study with Cronbach's alpha of 0.76 (Standardized Alpha: 0.78) showed that GHQ-12 is adequate reliability and validity tool in the Spanish population [8]. Their study concluded that GHQ-12 can be used to assess people's overall psychological well-being and to detect non-psychotic psychiatric problems. Also, their results with sample of1001 subjects, ages between 25 to 65 years, suggested that the GHQ-12 can be considered as a multidimensional scale that assesses several distinct aspects of distress, rather than just a unitary screening measure. Muhamad Saiful Bahri Yusoff (2010) used the Malay version of GHQ-30 and GHQ-12 in detecting distressed medical students. The findings of the study concluded that both GHQs are reliable instruments to detect distressed students. The analysis also found that the short version to be as reliable as the longer version[7]. Mansor, M. et al. (2016) study showed GHQ-12 is reliable and valid to assess the general health among women with abnormal Pap smear. Their study also detected stress and depression among women with abnormal Pap smear. The GHQ-12 is an appropriate instrument for research and health intervention [9].

In this study the threshold for no psychiatric disturbances' symptom criteria is assumed to be a total score of GHQ-12 less than mean score of the respondents. The data consisted of three categories of adolescents: (1) 'Group 1', the parents of adolescents, had no history of psychiatric health problems (ii) 'Group 2', one or both of the parents were suffering from psychological or addiction problems and at least once been hospitalized for treatment of psychiatric illness , and (iii) 'Group 3' , the parents' psychiatric health was unknown. Group 3 is further divided into two groups, namely, government school students and private school students' having 67 and 73 numbers of respondents respectively. Cronbach's alpha reliability (Cronbach, 1951) test is used as a measure of reliability in the test items for 'Group 3' respondents. The GHQ -12 score totals which were based on Likert scale (0-3) are scaled down to 12 for 'Group 3' for the purpose of comparing the bi-modal scale with four-point Likert scale. The main objective of this paper is hypothesis testing, in which the null hypothesis specifies no difference between groups based on mental health of the parents. The significant difference between the groups may emphasize the need of early medical interventions. We applied two non-parametric tests viz., Wilcoxon sum rank test and the permutation test for the same population. Firstly, Wilcoxon and permutation tests are applied to compare GHQ-12 score totals of (i) Group 1 and Group 2; (ii) Group 1 and Group 3 (government school students); (iii) Group 1 and Group 3 (private school students); (iv) Group 2 and Group 3 (government

school students); (v) Group 2 and Group 3 (private school students); and (vi) government school students and private school students of 'Group3'. Secondly, we applied linear regression to estimate the totals of negative items with total of positive items in case of Group 3 students. Besides introduction, the paper consists of three more sections. Materials and methods are presented in section 2, results in section 3 and paper is concluded in section 4 with discussion.

2. MATERIALAND METHODS

2.1 Material

This study is aimed at common and minor psychiatric disturbances associated with adolescents using GHQ-12. The respondent adolescents were students of classes IX and XI in a government school and a private school, both in New Delhi, India. A total number of respondents was 256 between the age-group 15-18 years, which were divided into three groups of size 58, 58 and140. The division was made based on the information available regarding whether either or both of their parents had some psychiatric problems and had consulted a doctor in that regard. In 'Control' or 'Group 1' the parents had no history of psychiatric health problems. In 'Case' or 'Group 2', one or both parents were suffering from psychological or addiction problems and had at least once been hospitalized for treatment of psychiatric illness. In 'Group 3', the parents' psychiatric health was unknown. The respondents generally belonged to lower or lower medium socio-economic strata as per Kuppuswamy scale [10].

Study under 'Group 1' was conducted with due consent from the school administration and respondents. On an appointed day and time students were made to assemble in a room and stay put at calm. GHQ-12 with bi-modal scale was administered under the supervision of experts. Students' queries / difficulties in understanding the questions were answered by the experts. Students were given 10 minutes time to fill GHQ-12 and duly filled forms were collected back at the same time. Same procedure was adopted for 'Group 3' using Likert scale (0-3). Study under 'Group 2' was conducted with due consent from the healthy parent and respondents. Respondents with psychiatric family history were asked to assemble in the psychiatry department of a hospital on a fixed date and time. Same procedure was adopted for filling GHQ-12 with bi-modal as explained above.

2.2 METHODS

The collected data was entered and analyzed by using R code 3.5 for windows. Reliability of the data is tested using Cronbach's alpha reliability (Cronbach, 1951) as is one of the most widely used measures of reliability in the social and organizational sciences. The non-parametric tests viz. permutation test and Wilcoxon test, are applied to compare the two populations. Linear regression is applied to estimate the negative score totals with positive score totals by applying.

3. RESULTS

This study is aimed to identify common and minor psychiatric disturbances using GHQ-12, screening tool with the adolescents. In 'Group 1'a total of 39 students out of 58 are having the score 5 or less and the maximum frequency is 25 which turned out to be for score 3. This is 67.25% of the total sample size, where the GHQ score is less than the cut off score of 6. In 'Group 2', a total of 50 students out of 58 had the score 5 or less and the maximum frequency is 33 corresponding to score 3. This is 86.21% of the total sample size, where the GHQ score was less than the cut off score of 6. There are 16 and 8 respondents of 'Group 1' and 'Group 2' whose score are found to be 6 or more. The frequency of each value of the score (0 to 12) based on bi-modal scoring criterion of GHQ-12 for 'Group 1' and 'Group 2' has been computed and displayed in figure 1.

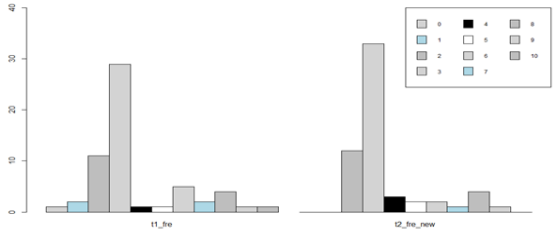

Figure 1: Frequency distribution of total scores of GHQ 'Group 1'and 'Group 2'

The 'Group 3' consisted of 140 respondents of class XI, whose family psychotic history is unknown. This 'Group 3' is further divided into two groups namely government school students and private school students having 67 and 73 number of respondents respectively. Likert scale was used for answering GHQ-12. The frequency of each value of the scale (0 to 3) for all items of GHQ-12 corresponding to government and private school has been computed and displayed in figure 2 and figure 3 respectively.

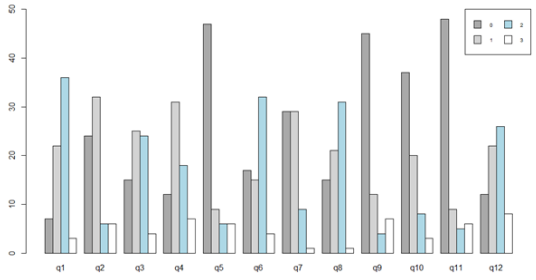

Figure 2: The frequency of each value of the scale (0 to 3) for all items of GHQ-12 corresponding to the government school

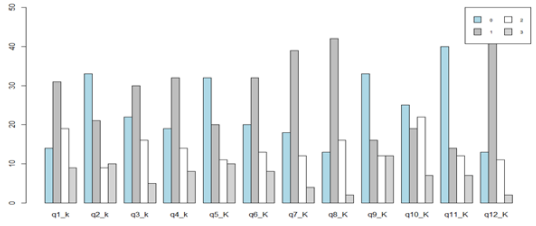

Figure 3: The frequency of each value of the scale (0 to 3) for all items of GHQ-12 corresponding to the private school

Table 1 shows item wise mean and standard deviation of students of both the schools. The means of item 1 corresponding to government and private school students are 1.52 and 1.32 respectively. The standard deviations of item 1 corresponding to private and government school students are 0.93 and 0.75 respectively. Similar descriptive statistics are computed for other items and are summarized in Table 1.

Table 1: Item wise mean and standard deviation of students of both the schools in Group 3. Total scores have been scaled down to 12.

School	Government (*N = 67*)		Private(*N = 73*)	
GHQ Item	**Mean**	**Std.dev**	**Mean**	**Std.dev.**
q1	1.52	0.75	1.32	0.93
q2	0.91	0.90	0.95	1.07
q3	1.25	0.88	1.05	0.90
q4	1.30	0.89	1.15	0.94
q5	0.58	0.99	0.60	1.07
q6	1.33	0.93	1.12	0.94
q7	0.73	0.75	0.83	0.80
q8	1.27	0.81	1.10	0.71
q9	0.61	1.00	1.04	1.14
q10	0.67	0.86	0.61	1.01
q11	0.55	0.97	0.81	1.04
q12	1.43	0.92	1.03	0.67

Table 2 below represents group wise descriptive statistics of 256 respondents giving minimum, mean, median, standard deviation and maximum value of the totals of GHQ-12 scores. Descriptive statistics are computed for all groups.

Table 2: Descriptive statistics for all the four groups

	Size	Minimum	Mean	Median	Std. dev.	Maximum
Group 1	58	0	4.24	3	2.5153	10
Group 2	58	2	3.53	3	1.7593	9
Group 3 (Government)	67	1	4.04	4	2.0869	9.67
Group 3 (Private)	73	1	4	4	1.3732	7.67

3.1 Data Reliability

The values of Cronbach's α, standardized alpha and Guttman's lambda 6, are computed for both the groups; government school students and private school class XI students and given in Table 3. The value of Cronbach's α for the private school 0.79 indicates the good internal consistency in the data. However, as Cronbach's α is 0.47 corresponding to government school students, but inter-item correlations is found to be more than 0.2 .which means that the items are still reliable to be used in the study.

Table 3: The Cronbach's α standardized α, and Guttman's lambda 6 for Government and private schools students in Group 3

School	raw_α	std.α	G6(smc)
Government	0.47	0.46	0.65
Private	0.79	0.79	0.83

3.2. Comparison of groups

The non-parametric tests viz. permutation test and Wilcoxon test, are applied to compare the two populations. Firstly, we have compared the two populations namely,' Group 1' and 'Group 2' populations with permutation test. There were 58 observations each under both the groups. Mean difference between the observations of 'Group 1' and 'Group 2 'were obtained. The value of test statistic using the mean differences of original sets of data and permuted sets of data under two groups is computed and the corresponding p value of the test is obtained. Secondly, we applied Wilcoxon sum rank test to compare 'Group 1' and 'Group 2' by combining the two groups and allotting ranks to the observations in the combined sample of 116 observations and computed the sum of ranks in each group. The test statistic is computed and corresponding p value of the test is obtained. Similarly, we compared (i) Group 1 and Group 3 (government school students); (ii) Group 1 and Group 3 (private school students);(iii)Group 2 and Group 3 (government school students) ; (iv) Group 2 and Group 3 (private school students) ; and (v)government school students and private school students of 'Group3' with permutation test and Wilcoxon rank sum test. The test statistic and p value of the test corresponding to each comparison are computed and displayed in Table 4.

Table 4. The Permutation test and Wilcoxon test Statistic and p-value to test

Test	Wilcoxon		Permutation	
Group	Statistic	p-value	Statistic	p -value
Group 1 and Group2	1.7383	0.08217	1.973	0.048
Govt. and Private	-9.3047	<.0001	-5.46617	<.0001
Govt. and Group1	-0.3892	0.3486	-0.4629	0.3217
Private and Group1	0.2720	0.6072	0.2177	0.5862
Govt. and Group2	-3.3376	0.0004	-3.3079	0.0005
Private and Group2	-2.2041	0.0138	-2.2383	0.0126

3.3 Estimating positive item total with negative item total

The overall Cronbach's α of size 0.79 for private school students indicated at the consistency of the data. The correlation test between the positive and negative scores of private school students had p-value < 0.001 which suggested that there exists significant linear relationship between the two. We estimated the negative score totals with positive score totals by applying linear regression. Results for correlation test and regression model are summarized in Table 5.

Table 5: Regression Analysis results and hypothesis testing for linear relationship between positive scores and negative scores in GHQ for private school students of Group 3.

Hypothesis	Test Statistic	Value	p-value	Result
$\rho=0$	6.6518	$\rho=0.6196$	<.0001	Correlated
$\beta_i=0$	0.710	$\beta_0=0.2482$	0.48	Model^ Neg_t = 0.2482+1.1496 *Pos_t
	6.635	$\beta_1=1.1496$	<.0001	

^ *Neg_t* -Negative scores total; *Pos_t* -Positive scores total

4. DISCUSSIONS

Parental psychiatric disorder affects several aspects of children's development, including their physical, cognitive, social, emotional, and behavioral development. The risks to children are greater when parental mental health problems exist alongside domestic abuse and parental substance misuse [11]. Still, the impact of parental psychiatric disorder on children is not included routinely in medical education, although it has been suggested to consider the context and background of patients' sickness to avoid misdiagnosis of childhood maladjustment and disorders[12].

To ensure the consistency and reliability of medical data where multiple-item measures of a concept are employed, Cronbach α is the most sophisticated and widely applied index of internal consistency. This examines the average inter-item correlation of the items in a questionnaire[13]. The value of Cronbach α is different for different data groups. For Groups 1 and 2, and Group 3 (government school) when this is not coming out to be very high, an alternative measure of inter-item correlation has been used to ensure the reliability of the data. However, for Group 3(private school), Cronbach α is coming out to be high (0.79) indicating high reliability and the fraction of a test score that is attributable to error is less.

The general environment also has a role to play in children development. This consists of family, friends, comfort of life, availability of education, family income, access to necessities etc. With a healthy environment around, children tend to live a healthy life. However, if a child has to struggle on one or more of these fronts, his or her general health, both physical and mental, might be affected.

In this paper it is found the total scores of GHQ of control and case group are significantly different with permutation test (p <.05). Psychopathology in the parent is producing psychological changes in the offspring, affecting their wellbeing[7,8,9]. Also, the significant difference in scores of government school students (generally belong to informal sector)and private school students (medium income group) suggests that the general atmosphere impacts the well being of adolescents. However, these are not amounting to any psychiatric disorder, but we have attempted to explain these changes based on cross- sectional data recorded in these adolescents.

REFERENCES:

1. American Psychiatric Association. Mental illness (an overview). 1994. Retrieved January 11, 2003, from http://www.psych.org/public_info/overview.cfm.
2. Goldberg, D. P., & Blackwell, B. (1970). Psychiatric illness in general practice: a detailed study using a new method of case identification. Br med J, 2(5707), 439-443.
3. Montazeri, A., Harirchi, A. M., Shariati, M., Garmaroudi, G., Ebadi, M., & Fateh, A. (2003). The 12-item General Health Questionnaire (GHQ-12): translation and validation study of the Iranian version. Health and quality of life outcomes, 1(1), 66.
4. Nunnally, J. C., & Bernstein, I. H. (1998). Psychometric Theory (McGraw-Hil).
5. McIver, J., & Carmines, E. G. (1981). Unidimensional scaling(No. 24). Sage.
6. Spector, P. E. (1992). Summated rating scale construction: An introduction (No. 82). Sage
7. Zulkefly, N. S., & Baharudin, R. (2010). Using the 12-item General Health Questionnaire (GHQ-12) to assess the psychological health of Malaysian college students. Global Journal of Health Science, 2(1), 73.
8. Sánchez-López, M. D. P., & Dresch, V. (2008). The 12-Item General Health Questionnaire (GHQ-12): reliability, external validity and factor structure in the Spanish population. Psicothema, 20(4).
9. Mansor, M., Haque, M., Sheikh, S. A., Choon, L. C., & Zin, A. M. (2016). Reliability and factor analysis of general health questionnaire 12 in malay version among women with abnormal pap smear results. Australasian Medical Journal (Online), 9(9), 357.
10. Sharma, A., Gur, R., & Bhalla, P. (2012). Kuppuswamy's socioeconomic scale: updating income ranges for the year 2012. Indian J Public Health, 56(1), 103-104.
11. Cleaver, H., & Unell, I. (2011). Children's needs-parenting capacity: child abuse, parental mental illness, learning disability, substance misuse, and domestic violence. The Stationery Office.
12. Taylor, D. C. (1985). The sick child's predicament. Australian and New Zealand Journal of Psychiatry, 19(2), 150-157.