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Research Article
Assessment of Psychological Well-being of Waste-pickers of Mumbai, India

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Abstract

Background and Objective: Waste-pickers work informally and earn hand to mouth by collecting and selling recyclable items out of municipal solid waste. Along with the opportunity for survival, waste picking also poses health hazards. The primary objective of the study was to assess the psychological health of waste-pickers of Mumbai using general health questionnaire (GHQ-12). Additionally, the study was carried out to determine the reliability and factor structure of the GHQ-12. **Materials and Methods:** Sample comprised 200 waste-pickers who were selected randomly from the communities near Deonar dumping site. **Results:** Results showed that around 70% of the respondents scored low on the GHQ-12 and a sizable proportion (32%) of them scored high, indicating an unhealthy psychological state. Reliability analyses suggest satisfactory results, with a Cronbach's alpha of 0.70. Meanwhile, factor analysis revealed that GHQ-12 was a measure of psychological distress, with a three-factor structure (psychological distress, social-emotional dysfunction and cognitive disorder), which jointly accounted for 54% of the variance. **Conclusion:** The findings of the study, therefore, affirmed that the GHQ-12 is a suitable measure of assessing the overall psychological well-being of waste-pickers.

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Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

In the developing countries, a rough estimate of waste-pickers is 15 million, of which around 1.5 million belonged to India[1]. The reasons for engaging in the occupation of waste-picking could range from high unemployment to a proliferating amount of solid waste and a growing global market for recycled materials. Along with the opportunity for survival, waste picking also poses health hazards. Characterized by 3Ds-dangerous, drudgery and demanding-waste-picking leads to fatal and non-fatal morbidities and it is widely reported[2-5]. The common morbidities found among waste-pickers were mostly, injuries/accident, respiratory illness and stomach problem, eye irritation and skin infection and musculoskeletal disorders. In addition to the occupational health risks, their deplorable living conditions, poor hygiene practices and substance use further inflate their health vulnerabilities. Waste-pickers work informally and earn hand to mouth by collecting and selling recyclable items out of municipal solid waste. Several studies highlighted that socio-economic deprivation resulting from unemployment is associated with various psychological disorders[6,7]. As the occupation of waste picking related to filth and dirt, it is important to assess the psychological morbidities and need to highlight the reasons, thereof. The psychological morbidities related to various occupation are widely assessed[8-10] but to date, there are hardly studies assessing psychological morbidity among waste-pickers. While assessing psychological morbidities, GHQ-12 has been used. General health questionnaire (GHQ-12) has been widely used for measuring psychological disorders. Though, it is used in many settings and languages but the Hindi version of GHQ-12 has not been assessed so far for its reliability and factor structure. The objectives of the present study are (i) Assess psychological health of the waste-pickers and (ii) To determine the reliability and factor structure while employing general health questionnaire (GHQ-12) for the waste-pickers.

MATERIALS AND METHODS

For the purpose, the GHQ-12 was chosen as a screening tool for psychological problems faced by the waste-pickers in the past 2 weeks. The GHQ was originally developed by Goldberg and has been widely used in various cultural settings as a screening tool to assess whether an individual was at a risk of developing a psychiatric disorder[11]. Psychological distress was measured by using the Hindi version of the 12-item general health questionnaire (GHQ-12). This study used an average GHQ scores as the cutoff points as recommended[12].

Sampling and sample characteristics: A cross-sectional study was conducted upon waste-pickers working at the Deonar dumping site-one of the oldest dumping sites in Asia, located in Mumbai. Waste-pickers engaged in waste-picking at the dumping site at least for a year and aged 18 years and above were considered for the study.

Sampling design: Three communities were selected, using probability proportional to size (PPS) sampling method as there were many slums on the edge of the Deonar dumping site. Many of the waste-pickers stay in these communities. In order to ensure the effective representation of waste-pickers, the selected communities were divided into a number of clusters based on natural divisions of the communities. Among the total clusters, approximately 10% were selected using the PPS sampling procedure. In the next stage, mapping and listing operation was carried out in the sampled clusters, where a screener (that is age, occupation and years of working) was canvassed to find targeted participants. Based on the sampling frame, the required number of households were selected by using systematic random sampling.

Sample size: The total sample size for this study was determined based on the proportion of waste-pickers in the selected communities. Field observations and discussions suggested that around 30% of the households in the study area had at least one person engaged in waste-picking. The estimated sample size was 426 households with a p-value 0.30, a response rate of 0.90 with design effect of 1.20. The present study primarily intends to investigate occupational health risks among waste-pickers along with psychological health status with a comparison group and hence, the estimated sample size was divided in 2 parts. Finally, a sample of 200 waste-pickers were interviewed (94% response rate). The data was collected during March-July, 2014.

Reliability: Meanwhile, the reliability of the measurement used in the present research was dependent on whether its components are consistent with one another and can be reproduced using a similar methodology and yield similar outcomes[13]. The internal consistency of the 12-item GHQ in

the present study was tested using the Cronbach's alpha. A coefficient value between 0.70 and 0.90 is typically reliable[14].

Factor analysis: A factor analysis was conducted to identify the underlying variables that would eventually help to explain the correlation patterns within the variables of GHQ-12. In addition, the factor analysis was done to identify a small number of factors in a larger number of manifest variables. In order to determine the reliability of factor analysis, the GHQ was tested using the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of Sphericity to determine its factorability. In particular, the KMO determines the suitability of using factor analysis on data, while the Bartlett's Test of Sphericity has been employed to determine the appropriateness of the sample size for conducting the analysis.

Subsequently, the factor structure of the GHQ was obtained by performing a principle component analysis with varimax rotation. The number of factors was determined by the eigen value greater than 1.00. According to Howitt and Cramer[15], the factors that contributed to the variable have a higher absolute value of loading. Any values of loading, greater than 0.30, has been considered as potentially meaningful. The present study suppressed all the value loading to less than 0.30 by changing the value to 0.00. The principle component analysis with varimax rotation yielded results on the factor loading values and variance percentage. The variables were grouped according to the loading size and they were arranged from high to low value.

Statistical analysis: A descriptive analysis was performed to determine the distributional characteristics of all the items of GHQ-12 to understand the level of psychological health of the waste-pickers.

RESULTS

Characteristics of the sample: Data in Table 1 presented the respondents' background information. A larger proportion of the respondents were found to be males (57%) and half of them were below 35 years of age with a mean of 34.0 (SD =10.2). Further, majority of them were not having any formal education (70%) and a minor proportion of them having 6 or more years of education. Similarly, nearly two-thirds of workers engaged in occupation for 10 or more years (SD =11.2).

Respondent's psychological health status: The Table 2 attempted to show the item specific assessment of

Table 1: Profile of waste-pickers (n = 200)

Characteristics	%
Age of workers	
<35 years	53.0
≥35 years	47.0
Mean±SD	34.0±10.2
Sex	
Male	57.5
Female	42.5
Education	
Illiterate	69.5
<6 years of education	19.5
≥ 6 years of education	11.0
Working years	
<10 years	41.5
≥10 years	58.5
Mean±SD	11.2±6.7

Table 2: Item specific assessment of mental health situation among the waste-pickers using general health questionnaire-12

GHQ-12 items	Yes	No
Able to concentrate	60.5	39.5
Loss of sleep over worry	40.0	60.0
Playing a useful part	78.0	22.0
Capable of making decisions	86.0	14.0
Felt constantly under strain	24.5	75.5
Couldn't overcome difficulties	19.0	81.0
Able to enjoy day-to-day activities	66.0	34.0
Able to face problems	73.5	26.5
Losing confidence	31.5	68.5
Feeling unhappy and depressed	39.5	60.5
Thinking of self as worthless	15.5	84.5
Feeling reasonably happy	71.5	28.5
Internal consistency of the GHQ-12	Alpha: 0.79	

psychological health situation of the waste-pickers using general health questionnaire-12. Analysis from the table suggested that one-third of the respondents reported of loss confidence and around two-fifths of the respondents loss sleep over worry and same proportion of respondents were feeling unhappy and depressed. Around one-fourth of the respondents felt constantly under strain and 16% of the respondents think themselves as worthless and almost equal proportions of the respondents were reported that they could not overcome difficulties. In all, 72% of the respondents reported to be reasonably happy in their life.

The descriptive analysis suggested that the mean GHQ score for the sample was 3.34 (SD = 2.90). Using the cut-off point of 5, the study revealed that 137 (69%) of the respondents scored 4 and below on the GHQ-12, while 63 (31.5%) obtained scores 5 and higher. These findings indicate that the proportion nearly one-third of the waste-pickers were vulnerable to develop and experience psychological problems. Further, the scores below 5 were categorized in two parts i.e., good (0-1) and intermediate (2-4). The analysis suggested that 67 (34%) of the respondents

Table 3: Varimax rotated factor structures on the GHQ-12

GHQ-12 Items	Factor 1	Factor 2	Factor 3
Feeling reasonably happy	0.85		
Losing confidence	-0.79		
Able to enjoy day-to-day activities	0.68		
Feeling unhappy and depressed	-0.54		
Able to face problems	0.39		
Thinking of self as worthless		0.91	
Felt constantly under strain		0.88	
Couldn't overcome difficulties		-0.43	0.40
Playing a useful part			0.70
Capable of making decisions			0.68
Loss of sleep over worry			-0.62
Able to concentrate			0.58
Eigen value	3.73	1.63	1.17
Variance (%)	19.80	17.90	16.60

Three factor structure of the GHQ-12 obtained from the principal component analysis varimax rotation, Blanks represents absent loading <0.3

scored 0-1 and graded as good psychological status, whereas, a little more than one-third of the respondents scored between 2 to 4, 70 (35%) and graded as moderate psychological status.

Internal consistency/reliability: This study employed the Cronbach alpha to test the internal consistency of the GHQ-12 questionnaire and the reliability of scale in context of the waste-pickers. Alpha value of 0.79 was found for the entire sample, indicating satisfactory internal consistency. Similarly, while analyzing item specific alpha value, each item in the scale showed more or less same internal consistency and the alpha value varies from 0.77- 0.79.

Factor structure: The results gathered for the factorability of the GHQ using the Bartlett's test of Sphericity and Kaiser-Meyer-Olkin (KMO) test were presented. The analysis showed that the Bartlett's test of Sphericity was significant at alpha 0.01 level, while the KMO value was 0.72. Therefore, it could be concluded that all the variables in the analysis had a factorability value.

The principal component analysis with the varimax rotation was performed on the GHQ-12. The results were shown in Table 3. The GHQ-12 was found to contain three underlying factors. These factors were identified as psychological distress, social and emotional dysfunction and cognitive disorder, which altogether accounted for 54.3% of variance. The first factor, i.e. psychological distress, was aimed to represent the psychological problems faced by individuals. This factor contained 5 items which include (1) Losing confidence (2) Feeling unhappy, (3) Thinking of self as worthless (4) Feeling unhappy and depressed and (5) Unable to overcome difficulties. The second factor, i.e., the social and emotional dysfunction, is a combination of the variables representing the inability of an individual to perform normal social and emotional functions in life. This factor included five items, namely: (1) Enjoy normal activities (2) Able to concentrate (3) Play useful parts in things (4) Able to make decision and (5) Face up to problems. The third factor, i.e., cognitive disorder, was pooled to represent the inability of an individual to have a normal cognitive judgment regarding things that happen in life. The cognitive disorder factor comprised two items: (1) Lost much sleep over worry and (2) Felt constantly under strain.

While analyzing of psychological health of the waste-pickers using the 12-items general health questionnaire (GHQ-12) and determining the reliability and factor structure of the GHQ-12, findings indicated that although more than the half of the waste-pickers (61%) scored below the cut-off point of 5, a considerable proportion (32%) scored above this cut-off point. This seems to suggest that a substantial portion of the waste-pickers have a potential to develop and experience psychological problems. Meanwhile, the information on the internal consistency of the GHQ-12 indicated that the scale is reliable to be used for measuring the psychological health of the waste-pickers. Any future research on the waste-pickers, which would be conducted in a similar methodology using the GHQ-12 would yield similar results. The factor analysis revealed that the GHQ possessed good structural characteristics and it comprised three factors known as psychological distress, social and emotional dysfunction and cognitive disorder. These findings are consistent with the results of some previously reported studies[16-18]. The GHQ-12 can be concluded as a multi-dimensional scale that assesses several distinct aspects of distress, rather than merely a general construct[19].

DISCUSSION

The present study intends to determine the psychological health of the waste-pickers. The study also aimed to determine the reliability and factor structure while employing general health questionnaire (GHQ-12) for the waste-pickers. While analyzing of psychological health of the waste-pickers using the 12-items general health questionnaire (GHQ-12) and determining the reliability and factor structure of the GHQ-12, findings indicated that although more than half of the waste-pickers (61%) scored below the cut-off point of 5, a considerable proportion (32%) scored above this cut-off point. Results seem to suggest that a sizeable portion of the waste-pickers have the potential to develop and experience

psychological problems. Field insights suggested that there could be various reasons for developing psychological problems experienced by waste-pickers. It could be due to the following reasons. Insecure housing was found to be major issue of worry among waste-pickers. It was noticed at the time of mapping and house-listing that many of them were ensuring that their house should get listed and numbered so that they can ascertain their citizenship markers. The people here were constantly afraid of the threat of eviction as Municipal Corporation of Mumbai runs a de-encroachment drive for illegal settlements near to dumping site particularly before monsoon season. Their lives take on a repetitive pattern of construction and breakdown-first families reclaimed the land from the marsh, lay the ground, build the walls and raise the tin roof. Then, a bulldozer accompanied by the police mows these houses down. Being a homeless is a major worry in the city like Mumbai. Second, waste-pickers were always in fear of loss of job from rag-picking as they hear repeated news of closing of Deonar dumping site in next few months. Third, there was hegemony of certain group/individuals who tried to show their reservation on waste. The daily struggle for survival, the uncertainty about the future, the lack of prospects for a better life, low wages and uncertainty of income all can have negative impacts on their mental health. Finding from a study highlighted that socio-economic factors that condition the life of these poor people were likely to have a close connection to minor psychiatric disorders. A study on Brazilian waste-pickers suggested that minor psychiatric disorders were the most important morbidity that waste-pickers face[20]. A past study on waste-pickers suggest a high prevalence of anxiety[21]. It is observed that informal workers particularly waste-pickers have low status than formal workers, lack security of employment and have less control over their working conditions[22]. Another study highlighted that the work stress may be due to inherent dangers of their work site, the risk of traffic accidents, irregular hour of work including night, social isolation and discrimination by society and considerable financial insecurity[20].

The work of waste-pickers involves frequent static postures[20] and this has been previously linked with musculoskeletal pain[23-25]. These, in turn, may lead to depression and anxiety[26]. Further monotonous work has been associated with psychological distress[27]. An another study also attest the evidence of mental disorder such as mild depression and mild anxiety among waste-pickers[28]. Meanwhile, the information on the internal consistency of the GHQ-12 indicated that the scale was reliable to be used for measuring the psychological health of waste-pickers. The factor analysis revealed that the GHQ possessed good structural characteristics and it comprised three factors knows as psychological distress, social and emotional dysfunction and cognitive disorder. In the similar vein, a study suggest that the GHQ-12 is a reliable and valid tool for measuring psychological distress among male tannery workers from India and the factors associated with it[29,30].

CONCLUSION

The present study determined the psychological health of the waste-pickers. The study also aimed to determine the reliability and factor structure while employing general health questionnaire (GHQ-12) for the waste-pickers. By using12-items general health questionnaire (GHQ-12), findings suggested that considerable proportion of the waste-pickers have the potential to develop and experience psychological problems.

SIGNIFICANCE STATEMENT

The findings of the study highlighted that considerable proportion of the waste-pickers may develop and experience psychological problems. The present study can be beneficial for the workers not only to waste-pickers but other type of conservancy workers. This study will help the researcher to uncover the critical areas of waste picking occupation and other occupations related to garbage handling work and its multidimensional health issues that many researchers were not able to explore yet.

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