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Advances in Applied Science Research, 2014, 5(4):131-135



Dimensions of health risks, health problems and livelihood conditions of municipality cleaning workers of Kumbakonam town: A perceptual study

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ABSTRACT

Solid waste management encompasses a wide range of activities including, Collecting garbage; collection, sorting recyclable materials; collection and processing of commercial and industrial. Risks occur at every step in the process, from the point of collection at homes, during transportation and at the sites of recycling or disposal. This paper discusses the occupational health risks of Municipality cleaning workers of Kumbakonam town. The information collected through the questionnaire has been transformed into SPSS (Statistical Package for Social Sciences) for the application of statistical technique to find out the relationships between the variables. Factor analysis was employed for the present data structure and accordingly a matrix of 300 X 60 was subjected to dimension reduction process. The present study revealed the health risks, health problems and livelihood conditions of municipality cleaning workers of kumbakonam town.

Key words: Health Risks, Factor Analysis, SPSS

INTRODUCTION

The collection of municipal waste is the greatest and most diverse set of all occupational hazards from waste management aspects [1]. The health of recyclers is at risk because of unsafe working conditions, socio-economic exclusion, and stigmatization [2]. Waste collection is a necessary activity all around the world and the removal of municipal solid waste is a job associated with a variety of biological, chemical, mechanical, physical, and psychosocial hazards [3]. In developing countries, the waste discharged for collection is seldom stored in closed containers and is dumped on the ground directly, requiring that it be shoveled by hand, or left in an open carton or basket to be picked up by hand [4]. Waste work is overridden by the social, economic, and environmental deprivations and also involves gender issues. Throwing waste bags resulted in high shear forces on the spine and carrying loads resulted in excessive torque to the shoulder resulting in increased incidence of musculoskeletal problem [5]. The joints affected in the order of predilection are knee, back; shoulder, elbow, ankle and neck. Higher joint problem were also reported from Indian cities Bombay, Calcutta and Bangalore [6]. The musculoskeletal problems are worsened by in appropriate ergonomics, the non-availability of worker friendly and women friendly tools and equipments [7]. In developing countries due to poor working conditions and lack of protection gear accident rates among solid waste workers are generally high [8] and a major health effect associated with the job has been shown to be injuries caused by work related accidents [9]. Majorities have given history of falls and injury 82 per cent of waste workers reported wounds in Katmandu, Nepal [10].

Study Area

Kumbakonam Town is situated on the old delta of river Cauvery, one of the important religious town in South India and second biggest town in Thanjavur District well known for its agricultural activities. Kumbakonam town extends from 10°51' North to 11°4' North latitude and from 79°17' East to 79°31' East longitudinally. It is a deltaic plain with smooth rolling surface towards to east coast. Kumbakonam city is bounded by two rivers, namely Cauvery on the North and the Arasalar in the south. At present, the city covers an area of 12.58 square kilometer. It has been divided into 45 electoral wards with a population of 1, 67,098 in 2011.

Importance of the Present Study

Standards of waste handling practice in industrialized countries have reduced occupational health problems and environmental impacts significantly. Contrary to that, the situation of developing countries is completely different than those of developed ones. The covered landfill site was more than three decades old method of waste disposal in industrial country. Since the last two decades, developed countries established sanitary landfills and started to use sophisticated machineries while handling waste to reduce health problems and environmental risk. Nevertheless, survival economies still cannot dump waste in controlled landfills and most of handling practices are labor intensive. In the whole cycle of solid waste management, from waste generation to collection-transport-dump to recycling or composting workers are suffering from varieties of health risk in Kumbakonam town.

Aim and Objectives

The present study is attempt to analyze the health risks, health problems and livelihood conditions of municipality cleaning workers of Kumbakonam town with a view to simplify the socio-economic, demographic and environmental background of Municipality cleaning workers of Kumbakonam town. To explore the personal hygiene, health status, health problems and health care of cleaning workers in relation to their occupation and to identify the statistical relationships and significance between the selected variables of the health status of the workers.

MATERIALS AND METHODS

The information collected through the questionnaire has been transformed into SPSS (Statistical Package for Social Sciences) for the application of statistical technique to find out the relationships between the variables. These variables are assumed to be the most important factor in determining the livelihood conditions of Municipality Cleaning Workers. Factor analysis was employed for the present data structure and accordingly a matrix of 300 X 60 was subjected to dimension reduction process. 12 out of 60 variables were extracted for the interpretation purpose of the present study. So the data were reduced to 12 X 12 inter-correlation matrixes to facilitate for easy interpretation and analysis. In addition to the above the factor loading matrix was used to explain the strength of relationship and the variance of each variable with all other variables.

RESULTS AND DISCUSSION

The application of factor analysis for the present study is very constructive in sorting out the major dimensions of livelihood conditions of Municipality Cleaning Workers. Four dimensions were extracted and contributing a total variance of 67.452 percent. An Eigen value of 1.0 is taken as a cut-off point to establish the number of dimensions to be extracted. Correlation matrix revealed the presence of many co-efficient of 0.4 and above. The Kaiser-Meyer-Oklin (KMO) value was 0.662, exceeding the recommended value of 0.6 and the Bartlett's Test of Sphericity arrived at statistical significance (0.000), supporting the factorability of the correlation matrix. Principal Component Analysis (PCA) revealed the presence of four components with Eigen values exceeding 1.0.

Factor I: Healthcare and Health Risks

The foremost factor "Healthcare and Health risks" has been emerged as a single most important factor with an Eigen value of 3.155 and the total variance of 26.290 percent. Six out of twelve variables are loaded on this factor. The variable that has the highest positive loading on this dimension is 'recent visit to the hospital' (loading: 0.888; individual variance: 80.0 per cent) and followed closely by 'reasons for recent visit to the hospital' (0.822; 68.9 per cent). These two variables are highly loading on the factor do show that the municipality cleaning workers (labourers) were confronting by the health risks followed by healthcare. These two variables that give meaning to the label for the factor dimension under discussion. Rest of the four variables loading significantly on the factor are

the additional support for emphasis on the meaning of the two variables above that is the healthcare and health risks due to the impact of occupation i.e. municipality cleaning works.

Table 1 - Factor Loadings

Factor	Name of the factor	Variable Number	Name of the variable	Factor Loadings
I	Healthcare and risks	11	Recent visit to the hospital	0.888
		12	Reasons for recent visit to the hospital	0.822
		8	Living in substandard area	0.679
		2	Health risks	0.635
		10	Association with family members	-0.627
II	Behavioural pattern	6	Types of dwelling	0.573
		1	Habits of Alcoholism	0.957
III	Physiological and psychological burden	9	Alcoholism due to the profession	0.915
		5	Health problems	0.901
IV	Livelihood environment	4	Psychological Problems	0.888
		3	Social exclusion	0.785
		10	Association with family members	-0.627
		7	Dissatisfied about living area	0.622

These workers were ‘living in substandard’ (0.679; 0.463) area particularly near the sewage and cesspool, turn in to conducive environment for breeding of mosquito which leads to infectious disease (malaria, filarial, dengue, Japanese encephalitis etc.), apart from their occupational ‘health risks’ (0.635; 0.82.8) like irritation of eye, injuries, awkward smell, accident are also responsible for their physical health. In addition to that most of these workers ‘type dwelling’ (0.573; 39.3) are huts and thatched house without ventilation and basic amenities. The respondents were informed and believing that the serious health problems are due to their nature of jobs and 51.7 percent of the workers were revealed that they are regretting to do this kind of risky works; 35.7 and 64.3 per cent of the respondents were recently visited to the hospital for the treatment of fever and stomach pain respectively. It is interesting to note that the workers ‘association with family members’ (-0.627; 59.7) negatively loaded and it is clearly indicating that they are not having good relationship with their family members due to their nature of work.

Factor II: Behavioral Pattern

The second important factor “Behavioral Pattern” with an Eigen value of 1.867 and the total variance of 15.562 percent and together with the main factor above accounts cumulatively for 41.851 percent. The municipal workers are having the ‘habits of alcoholism’ (0.957; 92.5), ‘alcoholism due to their profession’ like sweeping, cleaning, removing sewage block, transporting, dumping are inducing the habits of alcoholism. Because of awkward smell from decayed organic and inorganic material, sewage, septic tank and working in untidy environment without protecting cloth or gloves or shoes.

Table 2 - Rotated Component Matrix

Variable No.	1	2	3	4	Communalities
11	0.888				0.800
12	0.822				0.689
8	0.679				0.463
2	0.635				0.828
10	-0.627			-0.441	0.597
6	0.573				0.393
1		0.957			0.925
9		0.915			0.901
5			0.901		0.658
4			0.888		0.485
3				0.785	0.805
7				0.622	0.552
Eigen Values	3.155	1.867	1.769	1.304	8.096
Percentage of variance	26.290	15.562	14.738	10.863	
Cumulative percentage	26.290	41.851	56.589	67.452	

The cleaning workers were informed (57.0%) that they are having the habits of drinking alcohol. Further, they revealed that the reason for drinking alcohol mainly because of relax and entertainment (37.3%), doing this kind of jobs (18.3%) and to forget the family problems (1.4%). Their drinking pattern varies from person to person. However, the respondents were viewing that they are drinking during work (23.3%), monthly once (8.7%), weekend

(7.7%) once in two days (5.3%) daily (5.3%), occasionally (3.0%), once in fortnight (2.7) and during festival time (1.0%). The monthly expenditure towards to alcohol were less than rupees 500 (6.7%), 501 and 1000 (19.4%), 1001 and 2000 (23.9) and above 2000 (6.7%).

Factor III: Physiological and psychological burden

The “physiological and psychological burden” is emerged as a third important factor with an Eigen value of 1.769 and the total variance of 14.738 and together with the above two factor accounts cumulatively for 59.589 percent. The municipal cleaning workers ‘health problems’ (0.901; 65.8) were ulcer (3.0%), body itching (4.0%), felon (2.5%), foot pain (14.0%), knee pain (5.8%), hip pain (9.2%), back pain (30.0%), head ache (9.0%), peeling of skin from hand and leg (7.5%), irritation of eyes (11.0%) and few (4.0%) were reported that they have been suffering from chest pain, dry cough and chronic fever. The ‘psychological problems’ (0.888; 48.5) followed by the physiological problems the respondents were revealed that they were psychologically suffering because of physical health (79.0%), economic (88.0%) and family problems (78.0%) and also they are regret to do this kind of job (51.7%) being in a technological world.

Factor IV: Livelihood Environment

The “Livelihood Environment” is emerged as a fourth important factor with an Eigen value of 1.304 and the total variance of 10.863 and altogether cumulatively accounts for 67.452 percent. The municipal workers were viewed that they feel by themselves as ‘social exclusion’ (0.785; 80.5) from other social groups. Because they were living in an isolated area; their communal backgrounds were reveals that 75.0 and 25.0 per cent of workers belongs to the schedule caste and schedule tribes respectively. Of the 300 respondents, 20 person’s houses were in slum area, 129 from surrounding villages and the remaining 151 government quarters. They are living in huts (45%), thatched house (10.3%), concrete house (43.0%) and tiled house (1.7%). Apart from that they are ‘dissatisfied about living area’ (0.622; 55.2) because they are living nearby sewage and cesspool area due to the mosquitoes problems (55.0%), untidy environmental conditions (33.3%) and awkward smell (11.7%). Their ‘association with family members’ (-0.441; 59.7) are limited because of the nature of work due to the starting of work very early in the morning and reaching to home late in the evening/night. 83.7 per cent of the cleaning workers living within the distance of two kilometers, 12.0 per cent were between 3 and 5 kilometer of distance and 4.3 percent were from more than 6 and 7 kilometers. According to the distance, the workers were reaching to the working place by walk (64.7%), bicycle (30.0%) and by moped and bike (5.3%). 37.7 per cent of the respondents were revealed that they had less than 10 years of experience, 37.0 per cent were having 21 and 20 years and more than 20 years are 25.3 per cent. The respondents were starting at home 5 and 6am, and 6 and 7am to commencement of their work 52.0 and 48.0 percent respectively. After their completion of cleaning work they used to reach home 54.7 percent and 45.3 percent at 3.30 and 4.30 pm respectively.

CONCLUSION

Factor analysis of data on 12 extracted variable-items of a questionnaire has yielded the four factors retained in the analysis, labeled as ‘Healthcare and Health Risks, Behavioral Pattern, Physiological and psychological burden and Livelihood Environment’. These four factors account for a cumulative variance of 67.452 per cent with first factor accounting for 26.290 per cent, second for 15.562 per cent, third factor for 14.738 and the fourth factor for 10.863. Thus, the present study certainly revealed the health risks, health problems and livelihood conditions of municipality cleaning workers of kumbakonam town.

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