

Research Article

Living conditions in boarding houses and health status among female industrial workers in Katunayake free trade zone, Sri Lanka

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ABSTRACT

Background: The industrial workers live in boarding houses situated close to the trade zones. The physical environment in boarding houses may affect the health status of industrial workers. The purposes of the study are to assess the living conditions in boarding houses and to analyse some aspects of health status.

Method: Community based, descriptive cross sectional study was carried out in 200 habitable rooms of boarding houses of female industrial workers in Katunayake free trade zone, Sri Lanka using an interviewer administered questionnaire. The data was analyzed using computer software; statistical package for the social sciences (SPSS) and GIS (geographic information system).

Results: Participants were between 16 to 45 years of age and majority having passed GCE O/L examination (66.9%), unmarried (57.5%) and sewing machine operators (66.3%). Main source of water for drinking and cooking (54.1%) was tube well. All of them shared sanitary facility. For the majority (71.2%) cooking areas were not separated from living room. Respectively, 45.3%, 51.4% and 3.3% perceived their general health as good, quite good and bad.

Conclusion: Main source of water for drinking and cooking was the tube well. Respectively most of them perceived their general health is as good and quite good. There were significant associations between frequency of cooking and perceived general health.

Keywords: Boarding house, Health Status, Habitable room, Living condition, Water and sanitation

INTRODUCTION

A boarding house is a house in which lodgers rent one or more people.¹ The level of health of the individual, group, or population as subjectively assessed or by more objectively measured is defined as the health status.² For the purpose of the study; industrial workers can be defined as workers who are employed at Free trade zone under different designation. Free trade zones can be defined as labour intensive manufacturing centers that involve the import of raw materials or components and

the export of factory products.³ Habitable room can be defined as a room constructed or adapted to be inhabited.⁴ Living conditions in houses can be defined by the physical environment that they live.⁵

Garment industry has become the Sri Lanka's major export earning industry.⁶ Literature revealed that more than 85 per cent of the employees working in the Free Trade Zones were young women.^{7,8} More over literature revealed that 98.2% of workers have come from rural

villages.⁹ Usually the industrial workers live in boarding houses situated close to the trade zones.¹⁰

Literature discovered that quality of drinking water in boarding houses is questionable. The inhabitants of the boarding house have insufficient sanitary facilities, and often they have to share one toilet with other members in the house hold.^{7,9} The employees have to cook their meals in a limited space inside their own habitable room in the boarding house.^{9,11}

Literature has proven that there is a relationship between health status among inhabitants and the living conditions in houses. Health status is largely affected by the physical environment in which they live.⁵ The physical environment in boarding houses may affect the health status of industrial workers, which in turn may bring about an impact on the production and on the income of the country.

General objective

To assess the living conditions in boarding houses and the general health status of female industrial workers.

Specific objectives

- To determine the socio demographic characteristics among industrial workers.
- To assess the living conditions in boarding houses among female industrial workers in Katunayake Free Trade Zone, Sri Lanka.
- To assess some aspects of health status related to living conditions among female industrial workers in Katunayake free trade zone, Sri Lanka.

METHODS

Community based, descriptive cross sectional study was done in boarding houses of female industrial workers in Katunayake free trade zone, Sri Lanka.

Workers who have been living for more than 6 months in a particular boarding house and workers who are resident for at least \geq five days per week were used as inclusion criteria. Workers who have congenital diseases or suffering from a preexisting disease were excluded.

A sample of 200 habitable rooms in boarding houses of female industrial workers, conveniently selected from Katunayake MOH (Medical Officer of Health) area where most of the boarding houses were located. One boarder who follows the inclusion criteria was selected randomly from each habitable room to participate in the study.

Data were collected by using an interviewer administered questionnaire and a physical assessment.

Firstly, a self-introduction of my self was done to both the owners of the boarding houses and the industrial workers resident in these houses followed by permission from the owners of the boarding houses to conduct the study. Considering the inclusion and exclusion criteria the eligible participants were selected from whom verbal consent was obtained. The participants were assured that anonymity and confidentiality of the data would be maintained throughout the study. The participants were informed about the procedure, purpose and the benefits of the study, and clarified the doubts about the study before collecting the data. They were assured that the data would be kept confidential and not be released without their permission. The participants were also informed that they could withdraw from participating. They were provided enough time before giving consent to participate. The data was collected only after obtaining informed verbal consent. The interviewing was carried out by protecting the participant's privacy.

The questionnaire consisted of open ended and closed ended questions on perception regarding health, information about the boarding house, drinking water, sanitary facility, food preparation; and cleaning and waste disposal. It was pretested prior to the study to detect the suitability and understandability, since the questionnaire was developed by self after reading the relevant literature.¹² The participants were asked to answer the questions according to best of their knowledge.

Then the relationship was assessed between the health status and living condition of boarding house.

Ethical clearance was obtained from the Ethics Review Committee, Faculty of Medicine, University of Colombo. Permission was obtained from the owners of the boarding houses. Each person was informed about the study, and informed verbal consent was obtained from the subjects who were willing to participate

The data was analyzed using computer software; Statistical Package for the Social Sciences (SPSS), using frequencies, mean values, and Chi-square tests; and GIS (Geographic Information System) to analyze distribution of permanent residence of participants.

RESULTS

Socio demographic characteristics of the study group

- Age range- between 16 years to 45 years. Mean age- 25.43 years.
- Seventy seven (42.5%) were married and 104 (57.5%) were unmarried.
- Most of the participants (66.9 %) have passed GCE O/L.

• Maximum number of participants (33%) had come from Kurunegala district. Subsequently 15%, 13% and 8% of participants were from Anuradhapura, Kandy and Nuwaraeliya districts.

Details of the boarding house

Mean duration of stay in the boarding house was 2.64 years. The mean distance between boarding house and work place was 1294.19 m and Standard deviation (SD) was 827.55 m.

All participants answered that they occupy the boarding house all seven days of the week. Mean staying hour was 11.39 hour per day in the habitable room in the boarding house. Mean numbers of occupants in the habitable room was 1.70 with a SD of 0.730.

Information regarding drinking water

Most of the participants, i.e. 54.1% used tube well water as the main source of drinking water. Consequently 22.7%, 15.5% and 7.1% used spring well water, public tap, and piped borne for their drinking water purpose. Majority of the participants that is 128 out of 181 (70.7%) did not treat water before drinking.

Only few 29.3 % treated water before drink. Out of 53 of habitants who treated water before drinking; 28 out of 53 (52.8%) boiled the water before drinking, 19 out of 53 (35.8%) used filter to treat drinking water and 6 out of 53 (11.3%) strained water through a cloth as the treatment method.

Most of them; 121 out of 181 (66.9 %) stored drinking water and a lesser number i.e. 60 habitants (33.1%) did not store drinking water. Figure 2 represents the type of water container to store the water used by the habitants.

Figure 2: The percentages according to type of water container.(attached in figure file).

Majority of habitants; (81%) 98 out of 121 who store drinking water, stored the water in plastic containers. None of them responded that they have observed any unusual taste, smell, sediment, or colour in the drinking water within last 6 months.

Information regarding sanitary facility

All used water sealed latrine to direct pit. All of them shared the facility with others in the boarding house. Mean number was 6.47+3.43 who shared the toilet facility with others. The mode was 4 people.

Information regarding preparation of food

Most of the participants (69.6%) always prepared their food (126 out of 181). Most of them (71.2%) answered that the cooking area was not separated from the room.

That means they have to cook their food keeping a gas or kerosene cooker in their own habitable room. Few of the participants cooked their food in an area separated from the habitable room (22.8%).

Out of 177 who cooked their own food, majority (53%) used gas as the cooking fuel. The main source water used to cook for habitants in the boarding house was tube well water (54.1% used).

Information regarding cleaning and waste disposal

All respondents said that they do their household cleaning daily. Most of them (91.2%) collected household waste to a bin, i.e. 165 out of 181. They collected it to a bin and kept it out of the premises and urban council collected them daily.

Perception regarding health

According to perception of participants, 45.3% perceived their general health as good, 51.4% identified their general health quite good.

According to their perception; following table 1 represents the frequency and percentage of diseases or symptoms that they had during last 6 months. (Attached in table file).

Table 1: The frequency and percentage of diseases or symptoms they had during last 6 months.

Disease or symptoms	Frequency	Percentage
Respiratory symptoms including frequent colds	66	36.5%
Gastrointestinal problems	20	11%
Food poisoning	2	1.1%
Joint pain	5	2.8%
Skin conditions	4	2.2%
Muscular pain	37	21.5%
Head ache	45	24.9%
Accidental injury	6	3.3%
If other	18	9.9%

Majority of habitant/ 66 had respiratory problems including frequent cold. Consequently, the participants had got headache (24.9%), muscular pains (21.5%), and GIT problems (11%). Majority 64.9% of the participants had consulted the doctor for the above health issues they have mentioned.

Association between frequency of preparation of food and perceived general health

Association between frequency of preparation of food and perceived general health is presented by table 2. Almost 70% responded that they always cooked their own food. Among those who always cooked their food, their perceived health was good (52%) and a quite good

(48%) within last 6 months. There was a significant association between frequency of preparation of food and perceived general health ($p < 0.05$).

Table 2: Association between frequency of preparation of food and perceived general health.

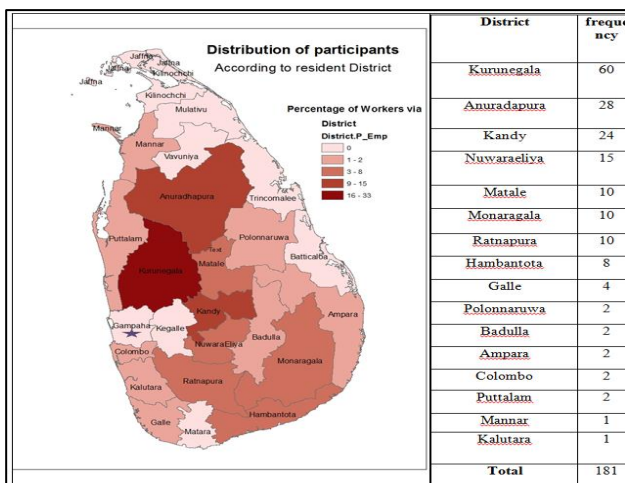
		Perceived general health			Total
		Good	Quite good	Bad	
Frequency of cooking one's own food	Always	66	60	0	126
	Usually	14	11	4	29
	Rarely	0	20	2	22
	Never	2	2	0	4
Total		82	93	6	181

According to chi square test; $\chi^2 = 35.624$; d.f. = 6; $p=0.000$.

Table 3: Association between frequency of preparation of food and frequency of GIT problems.

		GIT problem times				Total
		1	2	3	5	
Frequency of cooking food	Always	11	0	2	1	14
	Usually	0	0	2	0	2
	Rarely	0	4	0	0	4
Total		11	4	4	1	20

$\chi^2 = 28.571$; d.f. = 6; $p= 0.000$.



Katunataka Free Trade Zone- situated in Gampaha district.

Figure 1: Distribution of participants according to their permanent residence.

Association between frequency of preparation of food by participants and frequency of GIT problems

Association between frequency of preparation of food by participants and frequency of GIT problems is presented by Table 3.

Of those who had GIT problems during the past 6 months, the occurrence was highest among those who

always cooked their meals i.e. 14/20 (70%). Three of them (21%) went to the extent of having 3-5 attacks during the period under review.

There was a significant association between frequency of preparation of food and frequency of GIT problems ($p < 0.05$).

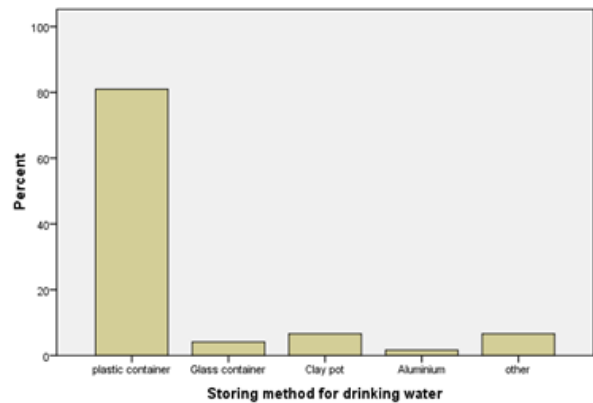


Figure 2: Type of water container to store the water.

DISCUSSION

Socio demographic characteristics of the study group

In this study group, the age ranged between 16 to 45 years with a mean age of 25.43 years. This is similar to the study using a random sample of 1058 female workers in the Free Trade Zone in Koggala, Sri Lanka, who found the mean age of the sample to be 27.8 years. However, in one study stated that most of the employees were young and their admission to the Free Trade Zone was between the ages of 18 and 25 years.^{7,13}

Most of the participants (57.5%) were unmarried. This is also similar to literature.^{7,9,14} Few of the participants were married; none were in the categories of separated or widowed.

Almost all participants have come from remote areas apart from western province. This is in agreement to some studies.^{9,11,14}

According to the current study majority of the participants (66.9%) successfully completed the GCE O/L as the final examination. A lesser percentage had been successful at GCE A/L examination. Similar results are indicated by a study which stated that most of the workers had an education beyond grade 10. Yet, dissimilar result as indicated by other study stated that the female workers were relatively under qualified in their education and a different study using 1162 working women concluded that 69.9% have had only 6-10 years of education and only a small number have passed their GCE O-Level examination.^{7,9,13}

All these data reveal that the female industrial workers in the Free Trade Zone are young and they start their job at an early age and most of them may give up their job too, at an early age. It may be due to many reasons e.g. marriage, health issues (work related disorders, diseases due to poor living conditions or disturbances) or psychological disturbances. Even though some studies have gained different results, they could be considered valid due to increased sample size.

Details of the occupation

Both literature and current study indicated the same result that is majority of the females working in the industrial zone were working as sewing machine operators.^{13,15} Work experience of the participants ranged from 6 months to 22 years and the median work experience was 3 years. Similar result was revealed by.⁹

Details of the boarding house

Mean duration of residence in the boarding house was 2.64 years in current study. Similarly in reference to the mean length of residence in the boarding house was very less (2.3 years).⁹

According to current study, the mean distance between boarding house and work place was 1294.19 m and standard deviation (SD) was 827.55 m. Similar results have been observed in many studies that most of the boarding houses are situated near the factory.^{7,14,16}

The probable reasons for the above result may be due to workers gaining fewer wages and that they should reach their workplace on time; on the other hand uncertainty of the public transport and on behalf of saving money they might prefer to stay in boarding houses within walking distance to the zone.

Occupancy in the boarding house

All participants in this study answered that they occupy the boarding house all seven days of the week. This means that they visit their home rarely i.e. once a month because most of them are from remote areas.

According to the current study, mean duration of stay was 11.39 hour per day in the habitable room in the boarding house. The duration of stay was ranged from 8-12 hours. All participants responded saying that they spend the nights in the boarding house. This may be due to their long working hours such as 10-12 hours per day.¹⁴

Mean numbers of occupants in the habitable room was 1.70 with a SD of 0.730 and it ranged from 1-4 according to current study. Number of occupants depends on the size of the room. The dimensions of the room and the openings to the exterior may determine the state of ventilation in the room while the number occupying would determine whether the room is over crowded or not.

A poorly ventilated and over crowded room may affect the general health status of its occupants particularly their respiratory health.

Information regarding drinking water

Most of the participants in current study (54.1%) used tube well water as the main source of drinking water and for cooking. Consequently 22.7%, 15.5% and 7.1% used spring well water, piped borne, and public tap for drinking purpose. None of them used rain water or bottled water for drinking purpose. According to studies the well water was the main source of water supply.^{7,14} Furthermore they discovered that the same well was used for both drinking and bathing.

The habitants who used tube well water, spring well water or piped borne water for their drinking water purpose facilitated the water in the same premises of boarding house in current study. According to results of the current study majority of the participants (70.7%) did not treat water before drinking. This is quite a high proportion. Only a few (29.3 %) treated water before drinking. Treating the water before drinking may be a necessity. Out of few habitants in current study who treated water before drinking, most boiled the water, some filtered and very few strained water through a cloth. They may know that treating water will make it safe to drink. Since they live with economic difficulties if they use a treatment method they need additional money. Therefore responsible authority should intervene to check the quality of water. Most of them stored drinking water and less number of habitants did not store drinking water. Majority of habitants (81%); who store drinking water, stored water in plastic containers. Few of the habitants (6.6%, 4.1%, and 1.75%) stored water in clay pots, glass containers, or aluminum containers. Some (6.6%) stored drinking water in other containers like filter itself before drinking. None of them responded that they have observed any unusual taste, smell, sediment, or colour in the drinking water; and any water supply disruptions during the last 6 months.

Information regarding sanitary facility

All participants of current study used water sealed latrine to direct pit located within the premises of the boarding house in and the sanitary facility was shared between 2-20 inhabitants. Literature too revealed that inhabitants of the boarding house have insufficient sanitary facilities, and often they have to share one toilet with other members in the household.^{7,9}

Information regarding preparation of food

According to this study most of the participants (69.6%) always cooked their food. Very few participants never cooked their own food. Similar to as discussed with the participants they said when they do not cook their own food they buy from vendors and some said that working

place provide breakfast and lunch. It was stated by participants of current study during the interview, who cook always that they usually cooking once a day and stored the food without any refrigeration. According to medical opinion, such habits are not healthy. The meals which they buy from vendors are highly questionable where the hygiene is concerned. According to the current study, about three fourths of the participants answered that the cooking area was not separated from the room. That means they had to place a gas or kerosene cooker inside their own habitable room. It was observed that there was a gas or kerosene cooker placed on a table inside the room which is used for sleeping with a mattress or bed, clothing etc. Majority (53%) of the participants used gas as the cooking fuel followed by kerosene (38%). Very few (5.5%) used fire wood as the cooking fuel in this study population. This is a good tendency because most of them cook inside the room and if they used biomass as a cooking fuel and if the ventilation is poor it may result in respiratory disorders among the inhabitants. Yet this may affect the indoor air quality which in turn may affect their health. Literature too revealed similar results that the employees have to cook their meals in a limited space inside their own habitable room in the boarding house.^{7,9,11}

Information regarding cleaning and waste disposal

All respondents in current study said that they do their household cleaning daily. Household waste was removed on the average of 5 ± 2.60981 days per week. Most of them (91.2%) collected household waste into a bin, i.e. 165 out of 181 and kept it out of the premises for the urban council to collect them daily. Sixteen out of 181 (8.8%) collected household waste into a pit. They also stated that they burn the waste. None of them were in the practice of separating, composting or recycling the household waste.

Perception regarding health

According to the perception, about half the participants of current study (45.3%) perceived their general health as good, another (51.4%) as quite good and a few (3.3%) as bad. None of them responded that their general health as worse. Majority of inhabitants of current study had frequent colds and respiratory problems. Consequently, the participants had headache, muscular pains, and GIT too.

Majority (64.9%) of the participants of current study had met the doctor for the above health issues they have mentioned. This result indicates that participants may think consulting the doctor for health issues is necessary. That seems as a good tendency.

Association between frequency of preparation of food and perceived general health

Those who always prepared their food perceived a better state of health when compared to the others in current

study. There was a significant association between frequency of preparation of food and perceived general health ($p < 0.05$). This may be due to the fact that they consume food prepared by themselves or it may be that, since they were in a reasonably good state of physical health they were able to prepare their own food. On the other hand, of those who had GIT problems during the past 6 months, the occurrence and frequency was highest among those who always cooked their meals i.e. 14/20 (70%). Three of them (21%) went to the extent of having 3-5 attacks during the period under review. This is controversial, as the occurrence and frequency of GIT problems are high among those who always cook their meals. This may be due to poor hygienic practice as stated by them in cooking at one time and keeping the food for the next meal/s without refrigeration.

CONCLUSION

The socio demographic characteristics among industrial workers

Majority of the participants were young, unmarried and almost all were away from the western province. Most of them passed the GCE O/L as the final examination.

The living conditions in boarding houses among female industrial workers

Drinking water: Most of the inhabitants used the tube well as the main source of drinking water and for purposes of cooking. Majority of the participants did not treat the water before drinking. Out of the few inhabitants who treat water before drinking, most boiled the water. However, the quality of drinking water is satisfactory.

Sanitary facility: All used water sealed latrine to direct pit. The sanitary facility was located within the premises of the boarding house in case of all participants. All shared sanitary facility among inhabitants.

Preparation of food: Most of the participants always cooked their food. For about three fourths of the participants the cooking area was not separated from the room. Gas and kerosene were the cooking fuel for a majority.

Cleaning and waste disposal: All respondents did their household cleaning daily. Most of them (91.2%) collected household waste to a bin and kept it out of the premises to be emptied by the urban council daily.

General health status according to perception of participants

According to their perception, 45.3% identified their general health as good, another (51.4%) as quite good and a very few (3.3%) as bad. There were none who responded their general health as worse. Majority of the inhabitants had frequent colds and respiratory problems.

Consequently, the participants had headache, muscular pains and GIT problems.

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REFERENCES

1. Wikipedia, the free encyclopedia. http://en.wikipedia.org/wiki/boarding_house. Accessed on 24 January 2014
2. Biology Online. Available at: <http://www.biology-online.org/search.php?search=health+status>. Accessed on 24 October 2012.
3. Wikipedia, the free encyclopedia. Available at: http://en.wikipedia.org/wiki/Free_trade_zone. Accessed on 25 January 2014
4. Herath HMSD. Manual for the Sri Lanka Public Health Inspectors. 1989;7:72-9.
5. Barton A, Basham M, Foy C, Buckingham K, Somerville. The watcombe housing study: the short term effect of improving housing conditions on the health of residents. *Epidemiol Community Health*. 2007;61.
6. Dheerasinghe R. Garment Industry in Sri Lanka Challenges, Prospects and Strategies. Available at: <http://www.sjol.info/index.php/SS/article/view/1246>. Accessed on 02 November 2012.
7. Reddies BKL. Women textile workers demand justice on the situation of the textile and garment industry in the countries of the south, friedrich ebert foundation. 1992.
8. Sri Lanka and the Free Trade Zones (TIE). Available at: http://www.tie-germany.org/what_we_do/new_organising-_exchains_-_sri_lanka.html/. Accessed on 02 January 2014.
9. Hettiarachchy T, Stephen L, Schensul. Exposure and sexual risk among young women in a free trade zone in sri lanka. *Ceylon J Med Sci*. 2002;45:47.
10. Arai E. Readymade garment workers in sri lanka: strategy to survive in competition, 2005. Available at: http://www.ide.go.jp/English/Publish/Download/Jrp/pdf/140_3.pdf. Accessed on 29 October 2012.
11. Weerasuriya P. The conditions of the workers in the free trade zones as a result of sri lanka's open economy. 2005. Available at: <http://www.tni.org/es/archives/act/2679/>. Accessed on 24 October 2012.
12. Core questions on drinking water and sanitation for household surveys. Available at: http://www.who.int/water_sanitation_health/monitoring/oms_brochure_core_questionsfinal24608.pdf. Accessed on 24 October 2012.
13. De Silva V, Lipscomb H, Ostbye T. Occupational health problems among female garment factory workers in Sri Lanka, 2012. Available at: http://oem.bmj.com/content/68/Suppl_1/A127.1/. Accessed on 24 January 2014.
14. Health Issues of Internal Migrants. Available at: <http://www.migrationhealth.lk/factsheets/Internal%20Migration%20fact%20sheet%28for%20website%29.pdf>. Accessed on 24 October 2012.
15. Joshi G. Garment industry in south asia rags or riches? Available at: <http://www.ilomirror.cornel.edu/public/english/regi on/asro/newdelhi>. Accessed on 3 November 2013.
16. Nielsen J. Export processing zones or free zones - the experience seen from a trade union point of view. 2012.

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