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Health related quality of life of women garment factory workers: Association with their food security and nutritional status

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ABSTRACT

Health related quality of life (HRQOL) is an individual's or a group's perceived physical and mental health over time. This study has carried out to find out the food insecurity, nutritional status and health related quality of life (HRQOL) of female garment factory workers and also the relationship of health related quality of life with food insecurity and nutritional status of female garment factory workers. This study has found that 71.9 percent female garment factory workers are food insecure and the percentage of being food secure is 28.1 percent. According to the Body Mass Index (BMI) classification for Asian people, 60.6 percent workers are in the normal range (17.5-22.9kg/m^2), while 27.2 percent are in the overweight (23-27.9kg/m^2) and 4.1 percent are in obese category (≥28 kg/m^2), and 8.1 percent are underweight (<17.5 kg/m^2) and with the waist circumference (WC) classification, 24.2 percent of them are in the normal range (WC<80 cm.) and 75.8 percent (WC≥80 cm.) are at risk of obesity category. Measuring the HRQOL of female garment factory workers, it has found that 84.6 percent respondents have restricted their daily activities for physical problems, 82.9 percent female workers have faced difficulties in running social activities and 86.6 percent contributors have not worked properly due to emotional problems. There are statistically significant differences between food secure and insecure respondents in *physical function, general health, vitality and mental health domains (P<0.05)*. Association of health related quality of life (HRQOL) within the Asian classified BMI categories, normal weight (17.5-22.9 kg/m^2) female garment factory workers show better health situation compared with obese group (≥28 kg/m^2). Statistically significant differences have found in *physical activities and role physical (P<0.05)*. Normal waist circumference participants have higher scores on *physical function, role physical and bodily pain scales (P<0.05)*.

Introduction

Bangladesh is an agricultural country but at present, the average productivity of industry is higher than agriculture. Bangladesh is the world's second biggest ready-made garment (RMG) exporter, simply behind China. The garment industry in Bangladesh is the fastest-growing of all industries and the key contributor to export earnings (Akter, 2019). In the fiscal year 2017–2018, Bangladesh's total export was $49.86 billion, while export of readymade garment (RMG) alone was $41.63 billion, which was 83.5% of the total export (Emran *et al*., 2019). This industry provides job opportunity to around 4 million workers; most of them are women (Emran *et al*., 2019). They are very poor and come from the miserable section of the society. As owners of the garment factories always target to generate more production at lower costs, so, they prefer women as workers compared to men. The docile characteristics and nimbleness of women also influence employers to recruit them with lower salary (Habib, 2014). When compared with other countries' minimum monthly wages in apparel industries, Bangladesh is at the bottom. The minimum and the highest salary division for garment workers are respectively 107 USD and 156 USD in Vietnam, 180 USD and 321 USD in the Philippines, 116 USD and 125 USD in Pakistan, 104 USD and 266 USD in Indonesia, 155 USD and 321 USD in China (Sheng, 2016). According to Bangladesh Ministry of Labour and Employment (2018), the current salary grades for garment workers range between Tk. 8000 (94.21 US dollar) and Tk. 18257 (193.79 US dollar) on a monthly basis include house rent, medical allowance, transport and food allowances (1 US dollar = 84.91 Taka). With this low payments, fulfilling basic demands in life such as access to adequate foods for three times (Sharmin *et al.*, 2019), minimum health care, medical services, hygienic accommodation are still major challenges for them (Ahmed and Raihan, 2014). Their low payments are also responsible for the lack of a descent diet which confirms good nutrition to them. It has found that 43.33 percent are underweight (BMI≤18.5

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kg/m^2) and 53.67 percent have different medical issues among female garment factory workers in Bangladesh (Hasnain *et al.*, 2014). For the monotonous type of work (long working hours with additional overtime), the workers always suffer from different health problems. Back or joint pain (Ahmed and Raihan, 2014; Steinisch *et al.*, 2013; Akhter *et al.*, 2010; Khan *et al.*, 2015; Fitch *et al.*, 2017), cough and common cold (Ahmed and Raihan, 2014; Fitch *et al.*, 2017; Chumchai *et al.*, 2015; Rahman and Rahman, 2013; Hasnain *et al.*, 2014; Khan *et al.*, 2015), continuous headache (Steinisch *et al.*, 2013; Akhter *et al.*, 2010), eye problem and loss of sight (Ahmed and Raihan, 2014; Khan *et al.*, 2015; Fitch *et al.*, 2017), difficulty in breathing which is associated with inhaling fabric dust (Ahmed and Raihan, 2014; Rahman and Rahman, 2013, Hasnain *et al.*, 2014) are reported as some common physical health problems of female garment factory workers. Otherwise, depression and hypertension (Shanbhag and Joseph, 2012; Fitch *et al.*, 2014), anxiety (Shanbhag and Joseph, 2012) and sleeplessness (Steinisch *et al.*, 2013) are identified as common health vulnerabilities also. They are originated from feeling unsafe in the workplace, low payment, risk of losing jobs and lack of recognition. Before focusing on the significance and the research framework of this study, a brief description is provided below on health related quality of life (HRQOL). It measures physical and psychological health vulnerabilities of an individual. At present, medical doctors recognize the patients' psychosocial factors in the cause and treatment of disease (Schipper *et al.*, 1996). These can range from the extreme state of disease to more positive state of well-being (Ware, 1987). The term quality of life and more specifically, health related quality of life (HRQOL) involves a person's physical, psychological and social views on his/her own health (Testa and Simonson, 1996). The most widely used health related quality of life instrument is Short Form-36 which is developed by John E. Ware, Jr. (Jenkinson *et al.*, 1999). This instrument is widely used in the medical outcome study (MOS). It is also supportive to investigate general population reviews and to initiate health policy, planning and strategies (Ihab, 2013; Alamgir *et al.*, 2013).

According to the Body Mass Index (BMI) classification for Asian People (Garvey *et al.*, 2016), 60.6% workers are in the normal range (17.5-22.9 kg/m^2), while 27.2% are in the overweight (23-27.9 kg/m^2) and 4.1% are in obese category (≥28 kg/m^2), and 8.1% are underweight (<17.5 kg/m^2) (BMI=weight/height^2). Using the waist circumference (WC) classification introduced by the World Health Organization (2000), 24.2% of them are in the normal range (WC<80 cm.) and 75.8% (WC≥80 cm.) are at risk of obesity category. Household size (OR 2.02, 95% CI, 1.52-2.69, P=<0.001) and female workers as head of the household (OR 0.42, 95% CI, 0.21-0.82, P=0.012) are found as associated factors linked with food insecurity of women garment factory workers. To refer the nutritional status of the female garment factory workers, number of children go to school from the family (adjusted b= -0.20, 95% CI, (-0.35, -0.04), *P*=0.013) is significantly associated with a decline in body mass index of contributors in the study. Increase a child who will study forces the workers to earn more and do extra overtime hours. The extra physical activity reduces weight and subsequently, BMI. Age (adjusted b= 0.30, 95%CI (0.15, 0.44), *P*=<0.001) and more physical activities (adjusted b= -0.05, 95% CI (-0.11, -0.003), *P*=0.04) are significantly associated with the increase or decrease in waist circumference of women garment factory workers. A food security research framework with its risk factors and consequences based on Campbell's model (1991) is presented here. Campbell indicates two sets of potential consequences of food insecurity in her model. The first construct of Campbell's model consists of risk factors (Socio-demographic, economic and working condition variables) that may influence diet and food insecurity of female garment factory workers. In the second part of the model, food insecurity and food intake are measurable components which are the ultimate outcomes measured by various risk factors. In the next part 'nutritional status', poor nutritional status of the respondents is linked with food insecurity which is measurable with anthropometric measurements. The final construct of Campbell's model consists of health related outcomes. This consists of various outcomes of health related quality of life associated with less food intake and poor nutrition. Campbell makes a very important notification that food insecurity can affect the health related quality of life either directly or indirectly through nutritional status. The research framework is presented in Fig. 1.

The objectives of the study are (i) to determine the food insecurity, nutritional status and health related quality of life (HRQOL) of female garment factory workers, (ii) to find out the associated factors for the food insecurity of female garment factory workers, (iii) to find out the associated factors for the nutritional status of female garment factory workers, (iv) to find out the association of HRQOL within food secure and insecure classifications and body mass index (BMI) and waist circumference (WC) categories of female garment factory workers.

Methodology

Study design and sample

A cross-sectional study has been conducted in this survey. The data collection has taken a total of seven months, within the period from February to August, 2014. The reason behind selecting Dhaka and Gazipur cities as these two cities are most densely areas having garment factories (Mottaleb and Sonobe, 2011). The inclusion criteria for the selection of garment factories are: (i) must have female workers, (ii) factory should be well-constructed i.e. do not have poor infrastructure, and (iii) should have all sections associated with the composition of fabric (from cutting to folding).

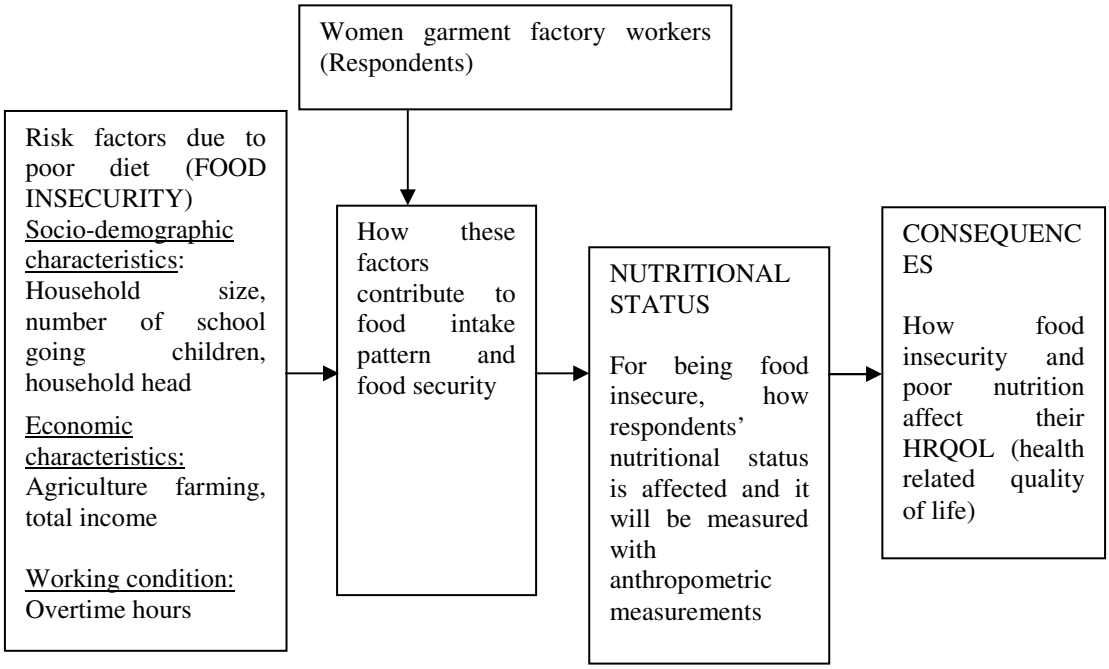

Fig. 1. Research framework, adopted from Campbell's model for food insecurity, its risk factors and consequences (Campbell, 1991)

Fig. 2 Gazipur and Dhaka city in Dhaka division

The author has used the records of garment factories located in Dhaka and Gazipur. Records have been collected from BGMEA office, Dhaka. The total numbers of garment factories in Dhaka have been found as 780, and 694 in Gazipur at that time. In total twenty factories have been selected for data collection purpose. However, for the selection of the garment factories in each city, purposive sampling has been carried out (Lucas, 2014). Three sections namely the sewing, quality control and finishing have been selected as these are the most female concentrated sectors.

The inclusion criteria for the study participants are: 1) all participants must be women 2) their age range from 19 to 40 years old. Female workers who are suffered from physical health problems as fever, cough and common cold, continuous headache and also pregnant workers are excluded as they are not physically fit enough to be respondents. One of the objectives of the work is to measure the food insecurity of the female workers including food insecurity of their offspring, so, the researcher has selected 19-40 years age range suited for the most productive age variety for female workers. Usually the workers get married at an early age and after 40 years, very few are able to continue their jobs (Akhtar *et al*., 2019). Otherwise, the minimum age limit is 18 years for any type of hazardous works referred by International Labour Organization Convention 138 (International Labour Organization Convention 138, 1973). The twenty factories which are included for the study purpose also follow the rule of not recruiting labours below 18 years old. Moreover, most female participants at 18 years old work as trainee has been found in the factories. They are not so familiar with the working environment and other vulnerabilities faced by the workers. So, the researcher starts the age criteria from 19 years old. Twenty-two respondents from nineteen factories and sixteen participants from one factory have been selected to make the sample size 434. The respondents have been selected using the convenience sampling. Through the convenience sampling, a sample is drawn from a group of people who are easy to contact (Saunders, Lewis and Thornhill, 2012).

A single proportion formula has been applied to figure the sample size for food insecure women garment factory workers: $(1.96/\Delta)^2$ P(1-P). The required sample size has been calculated for logistic regression analysis:
n=20k/P (Peduzzi *et al*., 1996)
k= number of independent variable
P= Percent from the previous study
n=20x16/0.85=376.47˜376

After including 20% dropout=376+75.2=451.2˜ 451 (to measure food insecurity)
The estimated sample size has been calculated for the linear regression analysis:
n=10k (k=number of variable) (Norman and Streiner, 2008)
n=10x14=140
After including 10% dropout: 140+14=154 (to measure nutritional status)
n=10k=10x16=160
After including 10% dropout: 160+16=176 (to measure quality of life)

Although the highest number of sample size is 451, the researcher has limited the sample size to 434 due to the limitation of time and resources. The insertion and elimination criterias both for the factories and respondents have been followed strictly. The workers' information and consent forms have been given to the participants to obtain their permissions to be involved in this study. The purpose of visiting the factories has been explained to the high officials and management before data collection. The objectives of the study have also been explained to the management of the factories.

Instrument

The female garment factory workers' food insecurity status has been assessed using the Bengali translated and validated Cornell-Radimer questionnaire (Sharmin, Isa and Manan, 2016). The researcher has measured household food insecurity with mother's hunger and child hunger. Female garment factory workers' nutritional situation has been measured with anthropometric measurements. With the measurement of weight, height, body mass index (BMI) and waist circumference, the nutritional condition has been measured.

The Bengali translated and validated Short Form-36 version 2 (SF-36 v2) questionnaire has been used to measure the health related quality of life of the women garment factory workers (Alamgir *et al*., 2013). This questionnaire consists of 36 items that are scored in the following eight domains: *role physical* (four items from 4a to 4d) caused by functional limitations due to physical problems, *general health* (five items-item number one and item numbers 11a-11d) queries on normal health status, *physical functioning* (ten items from 3a-3j) physical tasks controlled from low to high ranges, *bodily pain* (item numbers 7 and 8) questions arise on having bodily pain and getting interfered in normal activities, *mental health* (five items as 9b, 9c, 9d, 9f, 9h) having mental health problems, *role emotional* (three items as 5a,5b,5c) task restrictions as a result of emotional problems, *vitality* (four items-9a, 9e, 9g, 9i) queries on having vivacity, and *social functioning* (two items-item numbers 6 and 10) issues on difficulties in running social activities for physical and emotional problems.

In scoring SF-36v2 questionnaire, for item no. 1, the scores range from 1 to 5 indicate 'excellent' or 'poor' health. The scores range from 1 to 3 referring item no.3 and the scores indicate 'yes, limited a lot' or 'yes,

limited a little' or 'no, not limited at all'. The scores are 1 and 2 for the questions in item no. 4 and 5, while the answers are 'yes' or 'no'. The two items numbered 6 and 10; the scores scale from 5 to 1 and 1 to 5 respectively as the same question is illustrated in two opposite ways in the social function domain. The scores are limited from 6 to 1 in items 7 and 8 when the answer on item no. 8 is conditional on the answers in item no.7. The scores of two domains namely vitality and mental health (items no.9a-9i) differ from 1 to 6 and 6 to 1 controlled with the specific question. The answers are 'all of the time', 'most of the time', 'a good bit of the time', 'some of the time', 'a little of the time' and 'none of the time'. The scores on the items of 11a and 11c extend from 1 to 5 in general health domain whilst the items on 11b and 11d vary from 5 to 1 at the same domain (Ware *et al*., 1993). The answers are 'definitely true', 'mostly true', 'don't know', 'mostly false' and 'definitely false'. Question number 2, which involves health change, is not incorporated for scoring. High score correspond to better health. The raw scores are re-calculated according to the dimension. The raw scale score transformation formula (Ware and Sherbourne, 1992) is shown below:

$$\text{Transformed scale} = \frac{\text{Actual raw score} - \text{lowest possible raw score}}{\text{Possible raw score range}} \times 100$$

For each scale, a score varies from 0 (most inferior assessed health) to 100 (most superior assessed health) has been calculated (Ware *et al*., 1993).

Apart from that, another questionnaire consists of the basic characteristics of the respondents has also been administered. The basic characteristics of the respondents entailed with three levels of information: *1) socio-demographic and 2) economic characteristics and 3) working conditions.* Information regarding various socio-demographic and economic statuses such as the age, educational qualification, possessing physical assets (bed, wardrobe, table, chair, television, refrigerator, fan etc.), salary and bonus received, allowance for accommodation, medical allowance, and compensation for work injury have been collected. The data regarding husbands and other family members' age, educational attainment and respective occupations have been collected also. Working condition variables are working hours included overtime hours, getting casual leave, maternity leave, sick leave, enjoying public holidays, job satisfaction and experience of harassment have been asked (Chowdury and Ullah 2010).

Data Collection

Prior to the data gathering, the tools have been endorsed by the University Human Ethics Committee from University Science Malaysia. The workers' information and consent forms have been translated into the Bengali language. The consent form consists of the topic of the research with a brief introduction, the purpose of the study, participants' eligibility criteria, potential risks, all possible benefits and voluntary nature of the participation. The respondents are very spontaneous in giving information during data collection. In the signature pages, the workers express their concerns about the risks and confidentiality of the study, and they are satisfied with the questions asked. The social compliance officers have provided their signatures in both the worker's and material publication consent forms as they have administered the consent discussion sessions. Taka 50 have been awarded to each participant after the completion of the data collection.

Data have been collected from each participant at a time and 15-20 minutes have been allocated for each respondent. Different codes have been given to the relationship of family members to the respondents, their education and occupation. Their working hours in one day which consist of overtime hours and their salary include basic salary with medical, food and accommodation allowances and overtime salary have also been recorded. To simplify the calculation of income, the salary sheets have been provided by the authorities. Questions pertaining to casual leave, maternity leave and sick leave have also been recorded. The respondents are sensitive about giving their response to occupation related abuses (physical, mental or sexual). The floor supervisors have helped sometimes to make the questions comprehensible to the participants.

To measure the health related quality of life (HRQOL) of the women garment factory workers, the author has completed eight domains of Bengali translated Short Form questionnaire (SF-36) by asking thirty-six questions to all individuals. Why they have been suffered from various physical and emotional problems and why they have so many obstacles in performing usual activities have been revealed from their answers. The author has used accessible terms in physical function scale such as laborious household works to represent vigorous activities instead of running or participating in strenuous sports; the questionnaire has been designed to make it easier for the participants to answer. When answering questions on the vitality and mental health, most participants are very emotional and describe in detail why they are depressed or why they feel nervous or anxious. The author gives her scoring following the SF-36 health survey manual and interpretation guide (Ware *et al*., 1993).

Statistical analysis

The collected data have been analyzed using Statistical Package for Social Sciences (SPSS) version 22.0. Descriptive statistics have been used to check for missing data. Basic characteristics of the respondents with anthropometric measurements, and data gathered through Cornell-Radimer questionnaire and SF-36 questionnaire have been tested for normality. As the distributions of all variables are normal, parametric tests

have been performed. When analysed, continuous variables have been presented in means with standard deviations, and categorical data have been expressed as a frequency with percentages. Independent t-test has been applied to compare the mean distribution of quality of life of food secure and insecure female garment factory workers and with waist circumference categories. The one way ANOVA has been applied to determine the mean distribution of quality of life in body mass index (BMI). Bonferroni or Dunnett C corrections have been applied to compare among the significant groups (Bachok, 2011).

Results

The mean age of the participants is 29.32(SD 5.42) years. Of the respondents, 32.5 percent are in the age group of 24-28 years representing a majority of the study population. While the identified lowest group is characterised by the >38 years age group (6.0 percent). A majority (48.2 percent) of the participants are educated up to the primary level while 42.6 and 9.2 percent of the respondents have received education up to secondary and higher levels respectively. The mean years of schooling is 7.35 (SD 2.41) among the female garment factory workers. The mean household size is 4.77 (SD 0.85) persons, following the mean number of children is 1.56(SD 0.69) and the mean number of children studying in the household is 0.95 (SD 0.92). All (100 percent) participants are married and following the patriarchal family structure in Bangladesh, most participants' households in this study are male-headed (82.7 percent). Only 17.3 percent families are headed by mothers after the death of their husbands or being divorced.

Most workers have migrated from rural areas (Sharmin, 2017) and 62.4 percent of the participants have agriculture farming over there. So, there is an opportunity for them of receiving share of basic foodstuffs from their farming. On the other hand, 37.6 percent respondents are not involved in any form of farming. Good earning and owning tangible assets indicate better economic condition for the workers. Around 97 percent of the participants have possession of their own physical assets. The mean basic income of the female garment factory workers has been found in this study is Taka 6194.40 and the mean total income is Taka 8502.57. From the variation of income range, 61.5 percent female garment factory workers' incomes range from Tk. 8000 to Tk. 10999, 33.6 percent earn from Tk 5000 to Tk 7999 and only 4.8 percent receive wages from the highest income category Tk 11000- Tk 13999 (Table 1). A total of 58.5 percent of the female garment factory workers are satisfied with their job while 34.5 percent are not satisfied with the working environment. Only 7 percent are not comfortable with the working conditions at all (long working hours without any break, overcrowded, congested and dusty area, poor ventilation, inadequate light). The findings indicate that most (80 percent) respondents complain about being mentally tortured by their supervisors (exposure of abusive language for doing mistakes, create pressure for doing more pieces of cloth in one hour), and 11.5 percent complain of being sexually harassed (unusual physical contact in overtime hours at night, demeaning remarks or eve teasing, force to do illogical relationship to get job promotion). The rest (8.5 percent) have not made any report regarding harassment. Doing overtime in garment factory is mandatory for more production and more profit. A highest (85.2 percent) percentage of female workers do overtime work upto 2 hours in a day, 12.2 percent exceed till 4 hours and 2.5 percent overdo til 6 hours. The mean days have been enjoyed as casual leave is 3.15 (SD 3.15) and the mean days have been taken as sick leave is 2.97 (SD 2.83). It shows a good remark that most (88.7 percent) participants have enjoyed full maternity leave and only 11.2 percent have enjoyed 2 months leave after their delivery (Table 2).

Table 1. Socio-demographic and economic characte-ristics of female garment factory workers (n=434)

Variable	n (%)	Mean (SD)
Age (y)		29.32(5.42)
19-23	69(15.9)	
24-28	141(32.5)	
29-33	119(27.4)	
34-38	79(18.2)	
>38	26(6.0)	
Years of schooling		7.35(2.41)
Primary (I-V)	209(48.2)	
Secondary (VI-IX)	185(42.6)	
Higher secondary (X-XII)	40(9.2)	
Household size		4.77(0.85)
3-4	162(37.3)	
5-6	265(61.1)	
7-8	6(1.4)	
>8	1(0.2)	
No. of children		
1-3	426(98.2)	1.56(0.69)
4-6	8(1.8)	
No. of children studying		0.95(0.92)
Marital status		
Married	434(100)	
Unmarried	0(0)	
Head of household		
Husband	359(82.7)	
Respondent	75(17.3)	
Economic characteristics		
Agriculture farming		
No	163(37.6)	
Yes	271(62.4)	
Having physical assets		
No	14(3.2)	
Yes	420(96.8)	
Female Workers' basic income (Tk.)		6194.40(545.69)
Female Workers' total income (Tk.)		8502.57(1258.90)
Tk.5000-Tk.7999	146(33.6)	
Tk.8000-Tk.10999	267(61.5)	
Tk.11000-Tk.13999	21(4.8)	

The quality of life of the female garment factory workers has been assessed using the SF-36 (v2) questionnaire. The mean values for Physical Function (PF), Role Physical (RP), Bodily Pain (BP), General Health (GH),

Vitality (V), Social Function (SF), Role Emotional (RE) and Mental Health (MH) domains are 84.33 (SD=14.48), 87.32 (SD=30.35), 82.29 (SD=21.63), 76.21 (SD=22.57), 83.32(SD=14.47), 95.27(SD=11.67), 86.94(SD=33.50) and 88.21(SD=13.70), respectively.

Table 2. Working condition of women garment factory workers (n=434)

Variable	n (%)	Mean(SD)
Job satisfaction		
Satisfied	254(58.5)	
Dissatisfied	150(34.5)	
Very Dissatisfied	30(7)	
Experience of harassment		
Mental	347(80)	
Sexual	50(11.5)	
No harassment	37(8.5)	
Overtime Hours (per day)		1.90(0.43)
1-2 hours	370(85.2)	
3-4 hours	53(12.2)	
5-6 hours	11(2.5)	
Period of casual leave (day)		
1-5	325(74.9)	3.15(3.15)
6-10	109(25.1)	
Period of sick leave		
1-5	354(81.6)	2.97(2.83)
6-10	73(16.8)	
11-15	7(1.6)	
Maternity leave (months)		
2 months (after delivery)	49(11.2)	
4 months (include 2 months before delivery and 2 months after delivery)	385(88.7)	

The percentage distribution of different activities among the respondents shows that 84.6 percent respondents have restricted their daily activities for physical problems, 82.9 percent female workers have faced difficulties in running social activities and 86.6 percent contributors have not worked properly due to emotional problems (Table 3). Poorer functional health status has been reported by food insecure individuals in most SF-36 scales compared to the food secure group. The mean score for physical functioning, general health, vitality and mental health show statistically significant differences between food secure and insecure respondents (P<0.05). No significant difference has been found concerning the functional constraints caused by physical health problems and emotional problems, social function and bodily pain domains (Table 4). The mean SF-36 scale scores within the Asian classified BMI categories indicate that, the mean physical function and role physical scores of the female garment factory workers between the obese group (≥28 kg/m^2) with normal (17.5-22.9 kg/m^2) group are significantly different (P<0.05) (Table 5). The respondents with the normal waist circumference (<80 cm.) have scored higher on all SF-36 scales compared to another group (≥80 cm). Normal waist circumference participants have significantly higher scores on physical function, role physical and bodily pain scales (P<0.05) (Table 6).

Table 3. SF-36 results for the study group (n=434)

Scales	Mean (SD)	Incidence among respondents (Minimum %)	Incidence among respondents (Maximum %)
Physical Function (PF)	84.33(14.48)	0(0.2)	100(13.6)
Role Physical (RP)	87.32(30.35)	0(5.5)	100(84.6)
Bodily Pain (BP)	82.29(21.63)	0(0.2)	100(49.8)
General Health (GH)	76.21(22.57)	0(0.5)	100(11.8)
Vitality (V)	83.32(14.47)	0(0.2)	100(11.1)
Social Function (SF)	95.27(11.67)	0(3.2)	100(82.9)
Role Emotional (RE)	86.94(33.50)	0(12.7)	100(86.6)
Mental Health (MH)	88.21(13.70)	0(0.2)	100(21.2)

Table 4. Health-Related Quality of life between food secure and insecure female garment factory workers (n=434)

Scales	Food secure mean(SD)	Food insecure mean(SD)	Mean Difference (95%CI)	P value
Physical function	86.84(13.54)	83.34(14.74)	3.49(0.46, 6.52)	0.024*
Role physical	86.88(30.01)	87.50(30.53)	-0.61(-6.99, 5.76)	0.850
Bodily pain	84.40(21.41)	81.46(21.70)	2.94(-1.59, 7.48)	0.203
General health	80.80(20.53)	74.42(23.11)	6.37(1.67, 11.08)	0.008*
Vitality	87.74(10.83)	81.60(15.34)	6.14(3.56, 8.72)	<0.001*
Social function	96.31(9.46)	94.87(12.42)	1.43(-0.74, 3.62)	0.195
Role emotional	86.06(34.77)	87.28(33.04)	-1.22(-8.25, 5.81)	0.733
Mental health	91.73(11.79)	86.83(14.16)	4.90(2.27, 7.53)	<0.001*

Table 5. Comparison of mean SF-36 scale scores in different BMI categories of the female garment factory workers (n=434)

Scales	BMI Categories				P value
	Underweight Mean (SD)	Normal Mean (SD)	Overweight Mean (SD)	Obese Mean(SD)	
Physical function	83.17(11.57)	85.03(13.91)**	82.11(16.21)	80(16.26)**	<0.042*
Role physical	86.12(31.83)	87.32 (30.35)**	85.24(28.70)	84.72(35.49)**	0.015*
General health	75.30(23.44)	77.13(21.38)	74.44(21.76)	76.21(22.57)	0.28
Vitality	82.45(15.37)	85.59(10.21)	83.32(14.47)	80.77(18.24)	0.07
Social function	94.96(12.14)	96.39(9.81)	95.27(11.67)	92.36(13.65)	0.068
Role emotional	86.05(34.33)	88.88(32.33)	87.28(33.45)	85.35(31.28)	0.29
Mental health	87.34(14.36)	89.59(10.95)	88.21(13.70)	87.55(14.31)	0.14
Bodily pain	81.27(22.70)	83.55(24.64)	82.05(20.54)	80.19(19.65)	0.07

*P<0.05; **Compared with obese group (≥28 kg/m^2).

Table 6. Comparison of mean SF-36 scale scores for normal and at risk of obesity (waist circumference) of female garment factory workers (n=434)

Scales	Waist circumference			*P*-value
	Normal (<80 cm) Mean(SD)	At risk of obesity (≥80 cm) Mean(SD)	Mean difference (95% CI)	
Physical function	87.38(11.56)	83.35(15.18)	4.02(1.25, 6.79)	0.005*
Role physical	92.85(25.17)	85.56(31.66)	7.29(1.35, 3.23)	0.016*
General health	78.88(20.64)	75.36(23.12)	3.51(-1.44, 8.48)	0.165
Vitality	84.90(14.49)	82.82(14.45)	2.07(-1.10, 5.26)	0.201
Social function	95.95(11.69)	95.06(11.68)	0.89(-1.68, 3.46)	0.496
Role emotional	91.74(27.26)	85.41(35.16)	6.33(-0.15, 2.82)	0.056
Mental health	89.82(13.41)	87.69(13.77)	2.13(-0.88, 5.14)	0.165
Bodily pain	88.72(17.20)	80.24(22.51)	8.48(4.36, 2.59)	<0.001*

Discussion

The ready-made garment industry in Bangladesh not only contributes to the nation's income, but has created income opportunities for women. Female workers are now self-dependent and they are also helping their families. But these benefits come at considerable costs to the women. Concerning job satisfaction in this study, numbers of workers (Dissatisfied-34.5 percent, Very Dissatisfied- 7 percent) have expressed their feeling in a negative way. From this survey it was found that inadequate lighting, constantly sitting or standing in one position without back rest and continuous noise from hundreds of machines make them to feel permanently tired. All the floors are overcrowded and they have difficulties in breathing due to fabric dust. There is no air conditioning, although there are electric fans on the production floors but the workers suffer from heat exhaustion, as the numbers of fans are not sufficient. The work is monotonous and repetitive and it puts constant pressure on fingers and wrists (for sewing machine operators who operate with hands), on legs (who operate with pedals) and on eyes (eye strain for quality checking on sewn products). They also suffer from absence of separate toilets, washroom facilities and safe drinking water. For non-existence of enough exit doors and safety related training and safety tools, the workers feel unsafe inside the factories. Low salary parallel with this hard work is one of the main reasons of their disappointment has been found in this study. Although the salary for seventh grade is now Tk 8000, but they want Tk 16000 to have a comfortable life.

Any work performed beyond eight hours a day is calculated as overtime work. Factory may do maximum overtime for 2 hours a day. No worker is required or allowed to do more than 12 hours overtime a week. Fifteen minutes will be given for rest if there is any overtime for 2 hours a day (Bangladesh Labour Act, 2006). But long working hours with excessive overtime has been found as a common practice in garment factories in this study. The female workers have reported that as the production quota is so high, they have to work ten to twelve hours regularly. The workers also try to do overtime to earn extra money. These extra hours should be paid on per hour overtime payment basis (Ministry of Labour and Employment, 2018), but the workers have complained they are not paid all time. According to the Bangladesh Labour Act (2006), it is stated the workers will enjoy 10 days as casual leave (section-115) and 14 days as sick leave (section-116). For female workers, eight weeks preceding the tentative date of delivery and eight weeks immediately following the day of delivery are considered as maternity leave (section-46) (Bangladesh Labour Act, 2006). But the workers have said that they do not enjoy sick leave or casual leave frequently. Generally, the workers suffer from headache, joint pain, eye complaints, body aches, and fatigue has been found in this study. But risks of cutting the attendance bonus and wages for the days running off from the factories, they avoid to take any leave. These physical sicknesses have become normal in their lives and they try to be more attentive in their works without taking any rest.

From this study a good remark has demonstrated that most (88.7 percent) participants have enjoyed full maternity leave and only 11.2 percent have limited their maternity leave for 2 months after their delivery. Causes behind this have found that they wish to earn more instead of staying at home. They need more money for the nourishment of new born baby. So, they have denied enjoying eight weeks leave before their delivery.

The female workers are destitute women with very poor economic background and in the factories; the promotion prospects are strongly associated with working time. Eighty percent female workers are mentally and 11.5 percent workers are sexually harassed in the factories has been found in this study. After increasing the salary, the workers are always forced to work faster and make more pieces of clothes within one hour. All the prod. manager, floor in-charge and line supervisors are male.. They use offensive words for committing mistakes and sometimes, they throw clothes on their faces. Sometimes the supervisors eve tease them while working. Their behaviours remark to unwelcome touch with other physical assaults. Doing overtime at night is another cause for the harassment of the female workers in the factories (Ahmed and Raihan, 2014). Female workers in the garment factories sometime have to work over night at the time of shipment or when excessive work orders are received by the factory. As female and male workers work together at the same place, sometimes they are sexually harassed by male workers or supervisors.

Despite all these harassments, the workers work from morning to overnight to earn and have a better life. But with these less earnings, they are living from hand to mouth and they are unable to maintain their other basic needs. Approximately 72 percent (71.9 percent) female workers are food insecure has been found in this study (Sharmin, 2017). Food insecure female garment factory workers have scored lower in the physical function, general health, vitality and mental health domains compared to food secure female workers. Food insecure workers cannot afford to consume healthy foods for them. Access to three times meal with nutritious foods and maintain a balanced diet is just an unrealistic imagination for them. They cannot buy fresh and protein rich foods as milk, meat, fish, fruits or other dairy products. They always suffer from malnutrition, diarrhoea, dysentery, less appetite, food poisoning, pain in abdomen, and gastric pain. In consequence, they are physically inactive and their general health status is very poor.

For insufficient earnings, the female workers always buy foods from markets without paying and they pay the due payment after getting the salaries. Food insecure workers are always in psychological pressure to distribute her scarce resources either on food or on other necessities such as housing, childcare, educational expenses, clothing and health care. This type of stressful decision promotes frustration, anxiety, feeling of helplessness and symptoms of depression in them.

The female workers have to work from dawn to dusk without any movement. They work with continued standing or sitting in awkward postures. Execution of this uncomfortable work for every day and not getting enough time for exercise, obesity increases among female workers. Obese female garment workers are physically inactive; feel body ache and their roles are also constraint due to physical problems have been noticed in this study. Moreover, less nutritional intake further contributes to poorer health and leads to be anaemic and iron deficient (Makurat *et al*., 2016; Hasnain *et al*., 2014). Obese women workers have more body fat and waist increases with become older (Stevens, Katz and Huxley, 2010). As an outcome, they cannot complete works in time and they accomplish works less than they usually do. They also suffer from back pain, neck pain, joint pain, musculoskeletal pain, neural problem and problem in body muscles, joint, tendons, ligaments and bones.

Conclusion

The growth and development of the garment sector largely depends on the female workers because female workers are the main contributors to this sector. The income level of the female workers is very low to survive. They cannot fulfil their basic requirements with their income. It minimizes their capacity in intake of nutrient enrich foods and maintain minimum health care as well as access to other amenities. Therefore, the government should raise the workers' basic salary in such amount which will be enough to achieve the necessities for their living. The garment factory authority should start to provide lunches with protein and vitamin enriched foods and in overtime periods, tiffin with quality foods like a banana, a boiled egg, a cup of milk etc. A policy can be initiated to create a wholesale market in the factory's premises. Basic foods at lower prices can be made available there, hence saving the workers' time and transportation costs.

Proper working environment is very essential to maintain workers' health which ultimately increases workers' skills for more production. The authority should provide cross ventilation in the workplace, installing adequate number of exhaust fans and powerful blowers in the workrooms to have a congenial working atmosphere. The presence of pure drinking water in all floors and separate rest rooms for the female workers should be ensured in the factory.

Long working hours in the factories with prolonged sitting or standing and excessive workloads increase the workers' fatigue and mental pressure. The working hours should be minimized for the physical and mental fitness of the workers. The female workers should give some breaks to get relax during their working time. Overtime hours should be reduced only for two hours and doing overtime in night should be eliminated, especially for the female workers. Labour codes for working hours, overtime and payment should be followed strictly. Annoying attitudes to the female workers and all harassments should be controlled strictly. Instead of gaining more profit, the authority should focus on workers' working environment and on their physical and mental health. Free campaigns on health improvement with checking weight or BMI can be started within the factory. Initiatives can be taken for doing exercises on holidays also. Healthy people are productive people and healthy workers are also needed for year round production. The large number of workers will be active and productive if they will avail of the opportunity to keep them free from physical and mental illness.

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