

Impact of Safety and Health Measures on Workers' Productivity in the Readymade Garments Sector of Bangladesh

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Abstract: *This study aims to investigate the impact of safety and health measures on workers' productivity in the readymade garments (RMG) sector in Bangladesh. A quantitative research method was applied where 202 structured questionnaires were used to be filled up by the workers from 15 RMG factories of four selected areas of Bangladesh (Gazipur, Ashulia, Tongi, and Uttara). The collected data were analyzed by using SPSS software (Version- 20) by adopting different statistical tools such as descriptive statistics, correlation, and regression analysis. This study found that the overall condition of workers safety is satisfactory; however workers' health hazard is the problem because of various diseases that affect the workers' health during their working life. The study results supported that there is a positive relationship between health and safety measures and workers' productivity. Particularly, safety and machinery have a significant positive impact on the level of employee productivity. The study concluded that workers' productivity has been gradually increased after the implementation of health and safety standards. Finally, this paper will be useful for policy makers to mitigate the existing problems regarding health and safety issues in the RMG industry in Bangladesh.*

Keywords: *health, safety measures, workers' productivity, RMG sector*

1. Introduction

Bangladesh has seen unprecedented economic growth for the last few decades keeping a healthy 7 percent-plus GDP growth, and for the fiscal year 2018-2019, it is 8.13 percent (Bangladesh Economic Review, 2019). Unquestionably, this rise in GDP growth has been possible due to the garments industry of Bangladesh moving forward at a great speed. Bangladesh holds the second position as an RMG exporter in the world just next to the giant economy China (Wadud, Huda, & Ahmed, 2014). The RMG industry is bringing more than 78 percent of foreign earnings in Bangladesh (Wadud et al., 2014), which has generated employment for more than 20 million people, especially for women (Samaddar, 2016). Bangladesh achieves its foreign earnings of the RMG

sector mostly from the European Union followed by the United States and Canada. Among all other factors of production, cheap labor and their dedication are the crucial factors behind the success of the RMG sector. For these reasons, Bangladesh is growing very fast to achieve its target of being a self-dependent country of this South-Asian region.

However, Bangladesh is confronting some challenges to continue its success in this industry. Unskilled labor, lack of education, and the deficit of technological knowledge are making it more vulnerable against growth consistency. Among all those issues, lack of safety and health measures in the working environment are getting the most serious public concern in this decade. The fire incident in the Tazreen Fashion factory in 2012 had taken the lives of at least 117 people. But, the Rana Plaza tragedy which occurred in May 2013 had broken all the previous records by killing 1,129 lives and putting their respective families in danger (Reinecke & Donaghey, 2015). It took the special attention of the general people around the globe, more preciously, the attention of buyers, and thus posed a real threat to the potential of this industry.

The owners of RMG factories exert maximum value to the financial benefits, which in turn push the workers to an inhuman environment. But this sort of environment has a serious impact on the mental condition of employees. It is well known that effective health and safety measures play a pioneering role in ensuring a good working environment which ultimately ensures workers' mental health. Employees put higher importance on the additional attention of their managers regarding health and safety issues. So, proper assurance of health and safety measures gives the employees better satisfaction with their working environment. For this reason the concern bodies like BGMEA and BKMEA and policy makers have a lot to ensure proper health and safety measures for the sustainability of this industry. If we can shrink the percentage of occupational health hazards, we can confirm quality work with efficiency and job satisfaction, which in turn will increase workers' productivity. So, the present study aims to investigate the impact of health and safety measures on workers' productivity in the RMG industry of Bangladesh.

2. Literature Review

Fire incident at Tazreen Fashions factory on 24 November 2012, came as an impending disaster for the RMG industry of Bangladesh, which took away the lives of at least 117 workers and injured more than 200 workers, making it the deadliest factory fire so far in Bangladesh. However, the Rana Plaza garment factory building collapse on 23 April 2013 exceeds the horror in Tazreen Fashion, which shattered the conscience of world humanity, killing 1129 garment workers and injuring more than 2,500 people (Reinecke & Donaghey, 2015). The shock would have been even greater if a bank, some shops, and some offices on the floor below weren't closed on that day (Donaghey & Reinecke, 2018). Again, in 2016, at least 24 workers died and around 50 suffered injuries in a mas

sive fire triggered by explosions at a packaging factory, named Tampaco Foils Limited in Tongi of Gazipur (The Daily Star, 2016). As a result of these incidents, the questions raised about the effectiveness of building safety systems, fire fighting rules, regulations and practices in Bangladesh (Wadud et al., 2014).

Initially, globally well-known brands and retailers were reluctant to take any initiative to prevent such fatal accidents in the Bangladesh garment industry (Rahman, 2014). But a series of fatal incidents of the garment industry has drawn the attention of stakeholders, and raise their concerns, especially of international buyers. For example, after the Rana Plaza accident, the USA canceled the GSP (Generalized System of Preferences) facility for Bangladesh on June 27, 2013 (Barua & Ansary, 2017). Companies like Walmart and Primark denied to take responsibility for these incidents primarily but were subsequently felt pressure to take responsibility (Reinecke & Donaghey, 2015). Finally, some of the world's leading brands formulate The Accord for Fire and Building Safety in Bangladesh and Alliance for Bangladesh Worker Society to ensure the building's fire safety for Bangladesh (Donaghey & Reinecke, 2018). More than 200 global apparel companies have signed this agreement (Prentice, De Neve, Mezzadri, & Ruwanpura, 2018). Accord has been criticized for focusing only on the garment industry of Bangladesh, even if there are accidents in the garment industries of other countries of the world (Prentice et al., 2018). However, the proper implementation of these initiatives can gain the confidence of stakeholders in this sector (Barua & Ansary, 2017).

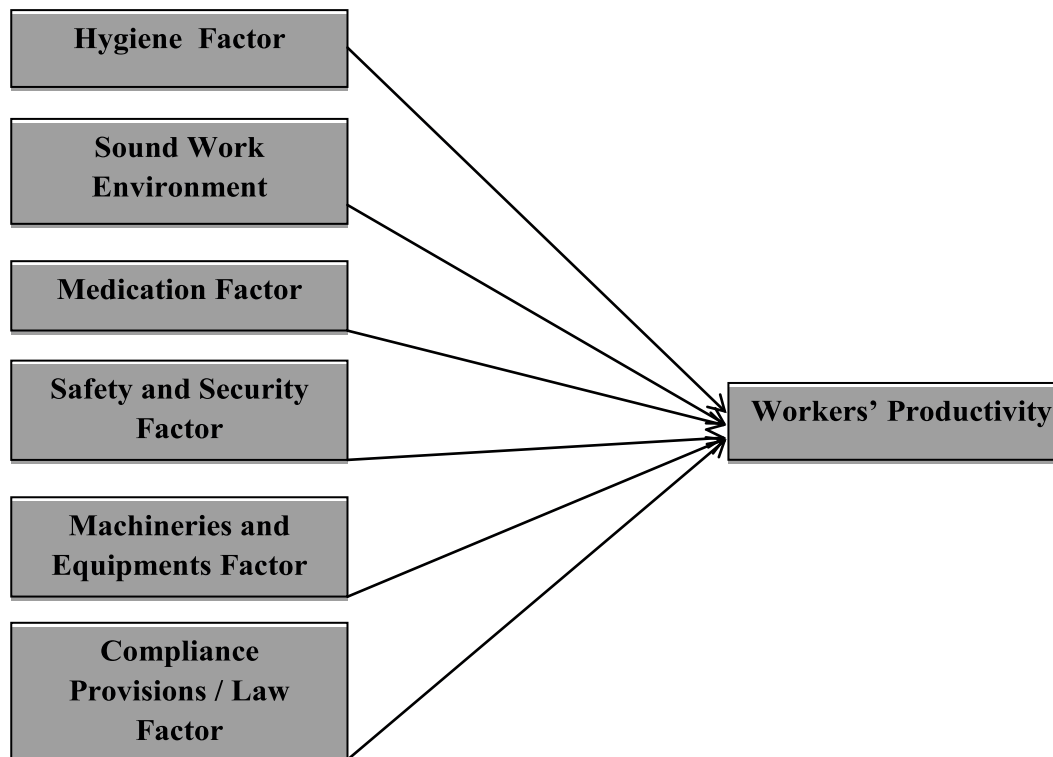
The physical environment of the garment industry, on the other hand, is also very risky for the health of the garments workers. But the physical environment of the workplace affects the mental and physical health of the workers which in turn influences the performance of their work (Absar, 2003). In many garment factories, the ventilation system is not well enough to allow air to flow out (Ahmed & Raihan, 2014). Besides this garment workers suffer from various physical complications not only due to the bad working environment of the factory but also their living environment at home (Ahmed & Raihan, 2014). Due to several physical complexities, their work performance also decreases (Syombua, 2014). Along with those violations of health-related labor laws cause widespread health problems for workers (Absar, 2003). Though health and safety are two burning issues influencing the extent of employee productivity, there is no significant research conducted to analyze this association. A lot of studies have been performed focusing on the RMG industry of Bangladesh, but safety and health issues are being neglected. Therefore, there is still a gap to find the relationship between health and safety measures and employee productivity. Moreover, most of the previous studies (Auffan et al., 2009; Lee et al., 2010; Niu et al., 2019; Theodore et al., 2019) on health and safety issues are conducted in developed countries. Therefore, there is a contextual gap particularly for developing countries like Bangladesh. The current research is an attempt to fill the theoretical and contextual gap of this field by analyzing the impact of safety and health measures on workers' productivity in the RMG sector in Bangladesh.

3. Theoretical Framework and Hypothesis Development

3.1 Research Framework

In this research it was hypothesized that workers' productivity is influenced by some work related factors like hygiene factors, sound work environment, medication factors, safety and security factors. Based on these issues, the following research framework has been proposed in conducting this study.

Figure 01: Research Framework



3.2 Hygiene Factor (HF)

Workers' physical and mental well-being depends largely on the cleanliness of factory premises (Smiddy, O'Connell, & Creedon, 2015). Hygiene factor includes latrines, urinals, and washing rooms, waste-basket, spittoons, removal of waste and effluents, safe drinking water, etc. The adequacy of these elements strengthens the mental health of the workers and increases their productivity. So, we developed the following hypothesis:

H1: There is a positive relationship between hygiene factor and workers' productivity.

3.3 Sound Work Environment (SWE)

A sound work environment enhances the performance of workers. The amount of work energy an employee gets is influenced by the environment in which he works (Dul & Ceylan, 2011). There is a need for a well-structured environment to increase the well-being of the people and to maximize the efficiency of the organization (Dul & Ceylan, 2011). In reality, it has become clear that a classification of building and installation of machinery are associated with the comfort level of employees (Roelofsen, 2002). Most of the workers spend the majority of their time indoors in a building, where the physical environment has direct impacts on their well-being and productivity (Kamarulzaman et al., 2011). Thus the following hypothesis has been developed;

H2: There is a positive relationship between a sound work environment and workers' productivity.

3.4 Medication Factor (MF)

Inadequacies in the medical system of Bangladesh and lack of awareness of physical and mental health make people sick frequently. Garment owners are not even aware of the health issues of their workers. On the other hand, the number of doctors in factories is insufficient and there is no proper medication. As a result, the worker suffers from various chronic diseases like severe headaches, heart disease, hypertension, diabetes and depression (Rizzo, Abbott, & Pashko, 1996). Due to various diseases workers' productivity reduces significantly. Hence it is hypothesized that;

H3: There is a positive relationship between medication factor and workers' productivity.

3.5 Safety and Security Factor (SSF)

Workplace safety and health, and workers' productivity are key issues for developing countries like Bangladesh. For example, improper workplace design, ill-designed jobs, unfavorable environment, poor ergonomics lead to workplace hazards, machine injuries, disabilities, and this, in turn, reduces worker productivity (Shikdar & Sawaqed, 2003). In the absence of proper safety measures, the workers feel unsecured which reduces their performance. The organization's safety and maintenance policy are very crucial for organizational effectiveness and worker performance (Abdul Raouf, 2004). Based on this we have developed the following hypothesis:

H4: There is a positive relationship between safety & security factor and workers' Productivity.

3.6 Machineries and Equipments Factor (MEF)

Man and machine fit are vital to increasing human productivity (Smith & Bayehi, 2003). The exact place needs to be fixed at the time of the machine installation so that people feel comfortable to use it. It is often seen that health and productivity of workers depend on machineries (Vink, Koningsveld, & Molenbroek, 2006). Therefore it is hypothesized that;

H5: There is a positive relationship between machinery and equipment factor and workers' productivity.

3.7 Compliance Provisions / Law Factor (CPF)

Many garment factories in developing countries do not comply well in terms of working conditions, child labor, and employment of women in risky work and like. It is not like that the developing countries lack the rules and regulation, rather they do not comply (Ronconi, 2010). The government should take the initiative so that all garment factories obey compliance. Then the chances of accidents in work in the workplace will be greatly reduced and thus workers' productivity will be increased. So, we developed the following hypothesis:

H6: There is a positive relationship between compliance law and workers' productivity.

4. Methodology

This study focuses on the impact of safety and health measures on workers' productivity. For conducting this study, mainly quantitative methods and survey studies have been considered as research techniques. In this study, workers' productivity of garments industry is dependent variable where hygiene factor (HF), sound work environment (SWE), medication factor (MF), safety & security factor (SSF), machinery and equipment factor (MEF), and compliance/law factor (CLF) are the independent variables. All the information except demographic variable was measured using 5 scale Likert Scales of 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree. SPSS software was used for analyzing the collected data.

4.1 Sample and Data Collection

For conducting this research, authors have targeted the garments workers of RMG factories situated at Gazipur, Ashulia, Tongi, and Uttara in Bangladesh as population. Then the authors went to some living area of garments workers to collect safety and health-related data through a structured questionnaire. As most of the workers are not capable of understanding the English questionnaire, authors have translated it into Bangla. In this way, a total of 220 sets of questionnaire were collected back from the respondents. The tenure of data collection for this study is from August 2018 to October

2018. The authors have rejected 18 erroneous and incomplete questionnaires. Finally, 202 questionnaires were selected for study purposes. Among the 202 respondents, 121 were male and 81 were female respectively. Respondents' profile has been presented in Table 01.

4.2 Background of the Respondents

Table 01 shows that among 202 garments workers, 27 were from ages 14 to 20, 151 were from 21 to 30, 23 were from ages 31 to 40 and 40 or above was 1 which means a greater portion of RMG workers are younger, comprising 75% of the respondents. Among 202 garments workers, one hundred respondents were married that means 49.5% and other respondents were unmarried. Table 01 also shows that about 25.2% of respondents were machine operators, 10.4% of workers were iron men and 28.2% of workers were the quality inspectors. About 6.4% of workers were folding men and 5% was packaging men and 15.8% was the helper. Finally, the remaining 8.9% of workers were cutting man, input men and loaders and appointed in other job responsibilities.

Table 1: Respondents' Profile

Demographic Information	Frequency	Percentage
<i>Age</i>		
14-20	27	13.4
21-30	151	74.8
31-40	23	11.4
40 or above	1	.5
<i>Marital Status</i>		
Married	100	49.5
Unmarried	102	50.5
<i>Worker Designation</i>		
Operator	51	25.2
Iron Man	21	10.4
Quality Inspector	57	28.2
Folding Man	13	6.4
Packaging Man	10	5.0
Helper	32	15.8
Others	18	8.9
<i>Working Years</i>		
0-1 year	37	18.3
1-2 years	95	47.0
3-4 years	50	24.8
4-5 years	10	5.0
5-6 years	8	4.0
6 years above	2	1.0

<i>Salary of the Respondents</i>		
5300-5900	33	16.3
6000-6900	62	30.7
7000-7900	86	42.6
8000-8900	21	10.4
<i>Educational Qualification</i>		
Up to class 5	23	11.4
6-8 class	76	37.6
9-10 class	44	21.8
S.S.C	34	16.8
H.S.C	19	9.4
Others	6	3.0
<i>Working Hour</i>		
Day	179	88.6
Night	23	11.4
<i>Overtime</i>		
Compulsory	8	4.0
Optional	194	96.0
Total	202	100.0

On the other hand, 18.3% of workers had been working for 0 to 1 year whereas 47% of workers had been working for 1 to 2 years. 24.8% of workers worked in the industry for 3 to 4 years and 5% of workers had been working for 4 to 5 years and 4% had been working for 5 to 6 years. Only 1% of workers had work experience for 6 years and above. It was noticeable that the work experience of the maximum workers was from 1 to 2 years. In Bangladesh, the minimum salary was BDT 5,300 which had already risen to BDT 8,000 from December 2018. It was found that 16.3% of workers had been receiving BDT 5,300 to 5,900. About 30.7% of respondents had been receiving BDT 6000-6900, which was the medium salary from the category and 42.6% of respondents had been receiving their salary in salary range BDT 7000- 7900, which was the most respondents' salary range. Remaining 10.4% of workers had been receiving BDT 8000-8900 salary range which was the highest-paid salary, but the percentage of the respondents was very low. In general, it was found that most of the workers were not satisfied with their existing salary. In this survey, the respondent's educational qualification is divided into six categories. It was found that 11.4% of workers had completed primary education and 37.6% had reached class 6 to 8. Besides, 21.8% of workers had passed class 9 to 10, 16.8% of workers had passed the S.S.C level and 9.4% of workers had passed the H.S.C level. So, their educational profile indicates that most of them were not highly educated. Most of the workers were working at day shift which is 88.6% among the respondents and the remaining 11.4% of workers were working at night shift. It was found that most of the male workers work at night shift. Moreover, most of the workers had no compulsory overtime. But sometimes they got overtime job. About 4% of workers had compulsory overtime and the remaining 96% of respondents had optional in case of overtime.

4.3 Statistical Techniques

In this study, MS Excel 16 and SPSS-20 have been used to process and analyze the data. Different statistical tools such as descriptive statistics, regression, and coefficient are employed for interpreting the data. The study used frequency, mean, standard deviations, standard error, ANOVA test, and correlation analysis to examine the relationship between independent and dependent variables.

5. Results and Discussion

5.1 Descriptive Statistics of Constructs

Table 2: Descriptive Statistics

Variable Category	N	Mean	Std. Deviation
Hygiene	202	4.6010	.24797
Environment	202	4.4505	.27673
Medication	202	3.9426	.38565
Safety	202	4.5115	.14988
Machinery	202	4.5488	.28231
Compliance	202	4.4678	.22211
Productivity	202	4.9229	.12673

Table 02 shows that most of the respondents agreed with the statement regarding the safety and health measurement variables. As the mean value of all the independent variables is more than 4 except medication (3.94) it indicates that the safety and health state of the RMG sector in Bangladesh is satisfactory. Besides, the respondents also agreed with the items under the dependent variable (productivity). The value of the standard deviation for all the variables is less than 0.4 which means a high consistency of the response of the participants.

Therefore, it can be said that all registered garments factories of the BGMEA in Bangladesh follow a standard level of health and safety policy or rules for their manpower. All factory buildings are safe for the workers. The readymade garment factories in Bangladesh keep a safety record book to entry any unsafe and safe conditions. The workers also get their emergency treatment (first aid supplies, emergency medicine, physician) when they need it. Therefore, finally, it can be said that the overall conditions of workers' health and safety are good and satisfactory.

5.2 Regression Analysis

The regression analysis output is shown in table 04. The coefficient of determination (R²) is 0.182 which indicates that productivity is explained 18.2% by the independent variables. The rest 81.8% variability can be described by other independent variables which are not considered in this model.

Table 4: Regression Analysis Output

Model	Unstandardized Coefficients		Standardized Coefficients	T	R ²	Sig.
	B	Std. Error	Beta			
(Constant)	4.006	.334		12.003	0.182	.000
Hygiene	.058	.035	.115	1.641		.102 Rejected
Environment	.082	.031	-.182	-2.607		.010 Rejected
Medication	.048	.022	-.148	-2.205		.029 Rejected
Safety	.203	.057	.244	3.590		.000 Accepted
Machinery	.090	.032	.204	2.804		.006 Accepted
Compliance	-.026	.038	-.047	-.696		.487 Rejected

a. Dependent Variable: Productivity

Table 04 shows that, the effects of independent variables (environment, medication, safety, and machinery) are significant at 5% level of significance as the p values (.010, .029, .000 and .006) are less than .05 and the other two remaining variables (hygiene variable and compliance variable) are insignificant as the p values (.102 and .487) are more than .05. But the direction of the relationship is not the same. The β value of hygiene is .115 which indicates a positive association, but the p-value is .102 which is greater than .05, therefore, the H1 is rejected. So, hygiene factors don't significantly contribute to increasing the level of employee productivity. Similarly, the β value of compliance is -.047 which expresses a negative relationship with productivity, but this is also not significant as the p-value (.487) is greater than .05 and H6 is also rejected. On the other hand, the β value of safety is .244 and the p-value is .000 ($p < .05$) that reveals safety measures have a significant impact on employee productivity, therefore, H4 is accepted. Similarly, the β value of machinery is .204 and the p-value is .006 ($p < .05$); so this variable has significant influence on the employee productivity level. As a result, H5 is also accepted. However, the β value of the environment is -.182 and the p-value is .010 ($p < .05$) which indicates a significant negative relationship between environment and employee productivity. Therefore, H2 is rejected by the outcome. Similarly, the β value of medication -.148 and the p-value is .029 ($p < .05$) that supports that medication is significantly and negatively associated with employee productivity. Finally, H3 is also not supported here. Hence, among the six hypotheses, only two hypotheses are accepted by the outcome of the current study. Safety and machinery significantly contributes to improving the productivity of the employees in the RMG sector of Bangladesh.

6. Discussion and Implications

This study was conducted to investigate the impact of safety and health measures on workers' productivity in the RMG sector of Bangladesh. It aims to show the relationship between one dependent variable (workers' productivity) and six independent variables: hygiene, environment, medication, safety, machinery, and compliance. Surprisingly, all the proposed hypotheses are not supported in this study, which calls for further empirical research in this field. For example, though hygiene factors show a weak positive association those factors do not significantly contribute to increasing workers' productivity.

It is because, from Herzberg's (1968) two factors theory of motivation it is proven that the presence of the hygiene factor satisfies people but does not motivate or increase productivity (Kazaz, Manisali, & Ulubeyli, 2008). Interestingly, the physical work environment, medication, and compliance showed a negative relationship with productivity. The result might be similar to Hawthorne Studies (REF). In garments industries, people work in groups. Even all members of one family work in the same garments factory as like group, which brings workgroup effectiveness that in turn fades away organizational context variables (Sundstrom, McIntyre, Halfhill, & Richards, 2000). Our study found that safety and machinery have a significant positive relationship with workers' productivity. For example, improper workplace design, ill-structured jobs, hostile environment, poor human-machine system design leads to workplace hazards, poor worker health, mechanical equipment injuries, disabilities, and in turn this reduces worker productivity (Shikdar & Sawaqed, 2003). So, these findings will be helpful to owners of garments factories while designing and installing machinery and equipment, and maintaining proper safety measures. The policy makers and government of Bangladesh will also find this study useful while formulating rules and regulations for the garments industries of Bangladesh. At the same time the findings of this study enrich the existing body of knowledge in the area of workers' benefits and productivity in RMG sector as very few studies have been conducted in this field in emerging economies.

7. Conclusion

RMG sector is the main source of foreign currencies in the economy of Bangladesh. The growth of the RMG and the knitwear industry in Bangladesh has made a crucial contribution to socio-economic development, and employment generation, especially for a large number of illiterate women. This industry is also contributing to women empowerment. That is why we have no choice but to keep the wheel moving of this industry for the economic progress of Bangladesh. This study analyzes and highlights the safety and health conditions and worker productivity of the garments industry. It found that the overall condition of workers safety is still not satisfactory, especially of small and non reputed factories. On the other hand, garments workers health conditions are still in danger because of various diseases that affect the workers during the working period. Many public and private, national and international actions had been taken after the collapse of Rana Plaza, so that, no such similar tragedy can take place in the future. Side by side, to continue the development and reputation of the garments industry of Bangladesh, the government, international buyers, apex bodies, non-governmental organizations have to keep a close eye to implement the initiatives that have been taken by Accord and Alliance. In the context of the present scenario, most of the RMG factories launched safety training, developed safety policies, keep the workplace clean, maintaining workplace tranquility, ensure proper medication, and inspect the hazardous machinery sincerely, which is a good sign for this industry. As fit workers are the key assets, improvement in the health status of garment workers is vital for the economic development of Bangladesh. A hazardous workplace cannot increase

profitability rather decrease workers moral spirit and hence productivity. Though this study has some theoretical and practical implications, it is not free from limitations. The study was conducted on a small sample collected from Gazipur and Dhaka districts in Bangladesh. So, the result of this study cannot be generalized. And this study was conducted only in the national culture of Bangladesh, more specifically covered only two districts. Future research may focus on garments factories situated in other districts in Bangladesh.

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