



Occupational Health Hazard, Reproductive Health and Domestic Violence against Women RMG Workers and their Effects on Workers' Productivity

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ABSTRACT

Purpose: The purpose of this study is to investigate the current state of women RMG workers' occupational health and safety, reproductive health, working environment and domestic violence and their possible effects on productivity.

Methodology: A cross sectional study has been conducted with structured questionnaire to collect data from 493 female garments workers of 44 ready-made garments factories of Bangladesh. The collected data tested by using Structural Equation Modelling (SEM) techniques with SMART PLS-4.0.

Findings: The study result shows that occupational health, occupational safety, reproductive health, working environment and domestic violence have moderate effects on worker's productivity and only occupational health and reproductive health have positive significant effects on worker's productivity. However, occupational safety, working environment and domestic violence have no significant impacts on workers productivity.

Practical Implications: To increase productivity, create a comfortable working space with the lighting, ventilation, safety gear, and hazard prevention measures and promote a positive attitude among management-level employees and also establish a counseling center for the female employees to ensure good reproductive health.

Originality/Value: Literature shows that no previous study considered the combined effects of domestic violence, reproductive health, work environment, occupational safety, and domestic violence on worker's productivity. The Maslow hierarchy of needs theory served as the inspiration for this investigation. In light of this, this study investigates the main working environmental factors generating low productivity in Bangladesh's RMG industries.

Limitations: This study is based on quantitative data analysis. In future qualitative research may be conducted for in depth study.

1. Introduction

Over the past three decades, Bangladesh's ready-made garment (RMG) manufacturing business has risen quickly to become the major manufacturing sector in the country. The RMG sector contributes

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11% to the nation's GDP and 84.5% of all exports from Bangladesh, which totaled over US\$47 billion in the 2021–2022 fiscal year (BGMEA, 2022). Moreover, the RMG industry has given access to new employment prospects for millions of people in Bangladesh, especially the four million women workers who make up 85% of the RMG workforce. The RMG industry in Bangladesh is thought to support women's independence, self-sufficiency, mobility, financial literacy and inclusion, and overall empowerment by giving young women an alternative path in a nation where gender inequality is pervasive and early marriage is very common. The majority of female RMG workers come from rural areas and are single when they start their careers. Many of them contribute significantly to their natal households' income and are active savers. Women have more income prospects in the RMG business, but there are also more health hazards associated with it such as breathing issues, joint discomfort, and anxiety. In Bangladesh, among the obstacles preventing women from accessing antenatal care outside of the workplace include long hours and minimal breaks (Dwyer et.al. 2022).

The majority of the working force in Bangladesh is made up of garment workers, who also generate the majority of the export revenue. For ethical, legal, and monetary reasons, workplace safety and health are crucial. The preservation of the lives and health of workers would be a moral obligation. The legal justifications for occupational safety and health policies are the preventive, curative, and compensatory impacts of legislation protecting workers' safety and health. Occupational safety and health can also lower the expenses of medical treatment, sick days, and disability benefits associated with worker injuries and illnesses (Khan, et al. 2016). It can be assured that high-quality work is completed by healthy personnel with their efficiency and contentment. When workers have guarantee of a healthy atmosphere and access to health care facilities, they will be more motivated to develop their skills in complicated and hard tasks (Joshi et. al. 2011).

Low pay, exposure to violence, and a heavy workload are some of the characteristics of the working conditions in RMG factories, have been increasingly featured by western media reports (Steinisch et al., 2014). The workplace environment produces occupational dangers and the prevailing occupational hazard cannot be underestimated. Associated risk may differ depending on the industry—from manufacturing to services (Sultana and Joarder 2020).

Vertigo, headache, low backache, joint discomfort, respiratory distress, anemia, feminine illnesses, diarrhea, needle prick injury, cut injury, and burn injury are among the most common ailments that Bangladeshi garment workers experience. Workers in Bangladesh and in fact workers in any developing country, are likely to have occupational health issues that are considerably more complicated and dangerous than those in industrialized nations. The Bangladeshi government is aware of the importance of having a good welfare program for the workers' health, safety, and wellbeing (Khan, et al. 2016).

Moreover, Bangladesh reported having one of the highest rates of intimate partner violence (IPV) worldwide (BBS, 2016). Evidence for IPV prevention is still lacking, despite the widespread acknowledgement of IPV as a crucial public health and human rights concern (Naved et al., 2018). When it comes to male aggression against women, according to a global ranking, Bangladesh ranks in second (Mahmood, 2004).

As many Bangladeshi women working in the RMG sector are in the earlier half of their reproductive years, they should have access to comprehensive sexual and reproductive health (SRH) and family planning (FP) information and services. An assessment of the SRH needs of female factory workers in Bangladesh found that knowledge and use of FP was high, but knowledge of sexually transmitted infections (STIs) and of measures to prevent STIs was low. The same study found that less than half of the women surveyed used sanitary menstrual hygiene products. Typically, factory workers in Bangladesh have limited access to FP/SRH information and services and menstrual hygiene products at work, similar to other countries with predominantly female garment sectors. Studies from Cambodia and Vietnam suggest that women in the RMG sectors have challenges accessing maternal and SRH/FP services (Dwyer et. al. 2022).

It is now pretty clear that there may be a variety of significant workplace variables that can hinder workers' performance, leading to low productivity. So, in order to have a thorough understanding, it is crucial to look at the characteristics of the workplace that lead to lower productivity. The established firms desire to climb up the manufacturing value chain to compete on technology and innovation because of the fierce competition faced by the manufacturing behemoths like China and India that are labor intensive, low cost, and wage economies. In order to maintain the competitiveness required by the demands of the current markets, manufacturing organizations attempt to rethink, redesign, and improve their production systems. The RMG sector in Bangladesh hasn't yet reached its full potential in the current environment (Saha, P., & Mazumder, S. 2015).

Worker work productivity won't increase on its own, the organization must pay considerable attention to the issue. Both the firm and the workers themselves need to play good roles in the process. Numerous elements, including those relating to the workforce itself, the business environment, and broader governmental policy, can have an impact on worker work productivity. Productivity is the capacity to generate work that meets or exceeds the employer's expectations (Meneze 2006).

There hasn't been enough research done in Bangladesh on occupational health and safety (Chowdhury and Tanim, 2016). A limited number of studies have examined the health of garment workers, health and safety compliances, and self-rated health outcomes to explain the occupational health and safety of the textile industries in Bangladesh and around the world (Ali, 2019). Even though 80% of the world's workforce is concentrated in developing nations, there is still no guarantee of health and safety. Numerous researches have been conducted on Bangladesh's RMG industries, but few studies have examined the elements in the workplace that lead to low productivity (Saha & Mazumder 2015).

2. Literature Review

2.1 Theoretical Underpinning

In the current environment of industrial competition, the elimination of occupational hazards and the risk associated with those hazards is absolutely crucial. According to the hierarchy of needs theory, when lower order needs are satisfied, a person is motivated to pursue higher order needs. The hierarchy of needs, such as those for physiology, safety, social needs, self-esteem, and self-actualization, drives workers' motivation. Organizational culture is linked to more fundamental physiological and safety requirements as garment workers attempt to meet their own demands for safety, security, and health (Jerome, 2013).

RMG industry female workers may also become victims of intimate relationship or domestic violence. In order to comprehend the experiences of domestic violence and intimate partner violence among female garment workers and how they affect productivity, this study also takes into account the traumatic union theory and the theory of the violence cycle. The traumatic union theory (Dutton and Painter 1981) discusses the significant attachment between the victim and the aggressor, which demonstrates the extreme nature of the good and bad treatment as well as the temporal position of both extremes. Walker's (1979) theory examines the cyclical pattern of the aggressor's violent behavior and how the cycle of domestic violence is characterized by structural, functional, and process elements. These intimate relationship or domestic abuse incidents are also related to safety requirements.

Therefore, this study primarily focuses on Maslow's lower order demands, which include working conditions, domestic violence, intimate partner violence, reproductive health, and occupational safety.

2.2 Worker's Productivity

Mathis Jackson (2008) mentioned that productivity is a measure of the amount and quality of work completed and the associated cost of the resources employed. Hameed (2009) productivity is a ratio

used to assess how effectively an organization (or person, business, or nation) transforms input resources (labor, raw materials, equipment, etc.) into finished goods and services. When an organization converts inputs into outputs efficiently and effectively, it is said to be productive. In general, the more satisfied workers are more productive with their work (Robins and Judge 2013).

Every organization strives to have a workforce with high production potential. The degree of education, skills, discipline, attitude, and work ethic, motivation, nutrition, and health, level of income, social security, work environment, work climate, technology, production facilities, management, and achievement all have an impact on a worker's productivity. Physical work environment includes all elements related to work-related capabilities that are physically connected to the work environment and have an impact on how well workers carry out their responsibilities. Dimensional physical elements that make up the workplace environment include: tools for the job, workspaces, lighting, air temperature, humidity, airflow, noise, mechanical vibration, and job security (Masharyono, Sumiyati, and Toyib 2016).

Katsuro, et al. (2010) studied on Zimbabwe food industry workers to find out the relationship between occupational health and safety (OHS) and worker's productivity and the result shows negative relation between OHS problems and worker's productivity. Rivai et al. (2019) studied previous literature to write a review article on workers productivity and found that worker's emotional intelligence, work environment, and work stress have effects on worker's productivity.

2.3 Occupational Health and Worker's Productivity

Various illnesses of garment workers affecting productivity (Seabrook, 2013). Sewing machine operators experience musculoskeletal illnesses, joint pain, respiratory issues, malnutrition, etc. as a result of spending a lot of time sitting in one chair with little to no movement of their bodies (Ahmed, 2014; Sharif et al. 2015). Diseases are side effects of many risks, which are largely the causes. Because physical violence, abuse, overtime work, wage discrimination, unofficial recruitments, and harassment are widespread practices in RMG factories in Bangladesh, the majority of workers struggle with psychosocial oppression.

Due to the dust produced by raw materials and the unsanitary working environment, RMG workers are commonly afflicted by a variety of ailments. As a result of their employment, it has been reported that they have developed a number of health problems, including coughs, fevers, jaundice, kidney failure, musculoskeletal issues, respiratory issues, and sexually transmitted diseases like HIV/AIDS. As a result, RMG workers get sick and are unable to work. They become less productive as a result and risk losing their jobs. Additionally, because the majority of RMG workers do not receive full pay while on sick leave, worries about health problems may result in stress and psychological health problems in addition to the financial strain.

A healthy economy, high-quality goods and services, and long-term productivity from that working group cannot be expected in poor working conditions where workers are exposed to a safe and healthy hazardous environment (Kabir et al. 2019). Katsuro et al. (2010) studied the impact of occupational health and safety on worker productivity on Zimbabwe food industry and found out the relationship between OHS and worker's productivity.

Thus, it can be hypothesized that

H1 Worker's occupational health has positive relationship with worker's productivity in the RMG sector of Bangladesh.

2.4 Occupational Safety and Worker's Productivity

Building collapses, factory fires, and child labor are the main kinds of workplace accidents in the clothing industry that have been documented between 1910 and 2015 (Peterson, 2016). In Sri Lanka, there is a law governing workplace health and safety. The ordinance has specific clauses that have direct bearing on lowering workplace stress. A recent analysis found that while general occupational

health and safety laws are still implemented in a reasonable manner, several provisions may be improved (Pallewaththa et al., 2018).

Due to the fact that most factories do not adhere to current labor regulations and international labor norms, the working conditions in RMG factories in Bangladesh have been poor (Ahamed, 2012). Despite its extraordinary success in terms of remittance earnings and creating jobs, this industry also saw some of the worst industrial catastrophes in history. The fire disaster at Tazreen Fashions of Ashulia, Dhaka, on November 24, 2012, which left 111 people dead and more than 300 others injured, is one of the deadliest mishaps (Chowdhury and Tanim, 2016). Since the Tazreen Fashions Workplace fire, at least 142 RMG factory fire mishaps have happened, resulting in 1,148 worker fatalities as of April 2017 (Solidarity Center, 2017).

Rana Plaza's 2013 collapse, one of the deadliest accidental structural collapses in history, raised questions about Bangladesh's workplace safety around the world (ILO, 2016). Due to the building's poor structural condition, it collapsed on April 24, 2013, causing 1,129 fatalities and over 2,500 injuries (Butler and Hammadi, 2013). It is believed that noncompliance with workplace safety regulations played a major role in the building's collapse (Ansary and Barua, 2015).

According to (Kaya, 2015), the physical and psychosocial environment of the workplace, as well as the design of all production tools and technologies, have an impact on worker satisfaction, which in turn has an impact on productivity level. By lowering the output-to-input ratio, workplace hazards and associated risk reduce both individual single-component and total factor productivity (Rezaei et al., 2015). A risky and dangerous workplace directly affects human resource management, competent and trained individuals lose motivation to work in a stressful setting. Workplace risks put workers' health at risk, and there are various negative implications of occupational risks on health (Mardiana Y. et al. 2012). From the above discussion and literature review analysis it can be hypothesized that

H2 Worker's occupational safety has positive relationship with worker's productivity in the RMG sector of Bangladesh

2.5 Domestic Violence and Worker's Productivity

The phenomenon of domestic violence, which can affect people of any age, gender, social class, or racial group (De Puy et al., 2015), is a source of great worry for the various creative spheres of society. In contrast, gender violence is one of the most extreme examples of gender discrimination and occurs everywhere, in all contexts, and across all industries that provide goods and services (Pérez del Ro, 2007). Different writers have studied its physical and psychological impacts, and various communication means frequently report on them (Martinez, 2010). Thus, gender violence is a severe societal issue that has an adverse effect on the victim's family, neighborhood, and place of employment in addition to having an influence on the aggressors and victims. The manifestations and effects of gender violence transcend the privacy of the house and have detrimental impacts in the workplace because both the victim and the aggressor spend a lot of time there. The dearth of research on the effects of domestic violence on customer service organizations in Puerto Rico served as the impetus for this study (Castro-González et al. 2016). Different studies show that IPV rate is noticeably high in Bangladesh (BBS, 2016; Naved et al., 2018) therefore, it is very much urgent to study the present situation of domestic violence and their impacts on productivity. From the above discussion it can be hypothesized that

H3 Domestic violence has relationship with worker's productivity in the RMG sector of Bangladesh.

2.6 Reproductive Health and Worker's Productivity

Reproductive health is a condition of not just the absence of illness or infirmity but total physical, mental, and social well-being in all matters pertaining to the reproductive system, its functions, and process. Workers are required to put in day and night shifts. Although they are legally entitled to it, they have no job security and no access to maternity leave. They have serious problems with their

reproductive health. The majority of garment workers have had many abortions, and the miscarriage rate among them is exceptionally high. There are a very small number of attempts made to address these issues. Owners of clothing are still breaking the law, which is why they have prohibited getting pregnant (Mahtab 2003).

Bangladeshi culture has long been known for its extremely early marriage and childbearing, which occurs during a crucial time for a person's physical, emotional, and intellectual growth. Compared to moms in the 20–24 age group, maternal mortality is likewise relatively high among mothers aged 15–19. According to a study conducted in Turkey, most adolescent pregnancies are unexpected and nearly 90% of them are unplanned. They are unaware that they need prenatal and postnatal care. Due to this, individuals have had a variety of issues with their reproductive health, including severe anemia, nutritional deficiencies, abortion, mother and infant mortality, early and low birth weight babies, and even death (Mita et al 2018). From the above literature, it can be concluded that there is a need for to study the reproductive health of garments workers and their impacts on productivity. Thus, it can be hypothesized that

H4 Reproductive health has positive relationship with worker's productivity in the RMG sector of Bangladesh.

2.7 Working Environment and Worker's Productivity

Ashraf et. al. (2013) the physical workplace has a significant impact on workers' job happiness and productivity. According to Hanaysha (2016), for businesses to be successful, they need create work cultures that will improve worker engagement and motivation, which would ultimately provide positive results. According to Khamkanya (2012), the secret to increased productivity is the ability to run the workplace in a setting that offers a pleasant, comfortable place to work, which in turn creates a setting that maintains an ideal level of productivity. Khuong and Le Vu's (2014) argued that workers who feel comforts in their working environment generate better work and respect than those who does not. Thee technical environment, the human environment, and the organizational environment are the three main sub environments that make up the work environment. Worker performance is impacted by the workplace environment. The kind of working environment that workers experience affects how well-off such businesses are. Worker productivity and organizational performance are being improved through physical design in conjunction with effective and efficient management practices (Hameed and Amjad 2009). The sum of forces, actions, and other influencing elements that are currently influencing or may in the future influence a worker's performance are referred to as the work environment. The interrelationships among individuals, as well as those between them and their workplace environment, make up the term work environment (Akinyele, ST 2009).

Because we believe that the workplace has an impact on workers both directly and indirectly, the workplace environment within a company must be taken into account. According to Putra (2017), the work environment includes the workspaces, resources for task assistance, cleanliness, lighting, peace, and working relationships amongst the people who occupy that space. Positive workplace culture enhances worker engagement, loyalty, productivity, efficiency, and sense of ownership among staff members, all of which improve organizational effectiveness and lower the costs associated with dealing with disgruntled workers (Raziq 2015). Edem (2017) asserts that the physical environment at work has a direct impact on human perception and has the potential to slowly alter social interactions and productivity. According to Awan and Tahir (2015) research, productive workers benefit from favorable work environments that include supportive supervisors, positive relationships with coworkers, training and development opportunities, attractive and quick incentives, and recognition programs.

We assume that a positive work environment can boost worker productivity and that a negative work environment will have the opposite effect. Saha P. & Mazumder S. (2015) studied the Impact of working environment on Less Productivity in the Bangladesh RMG Sector and found that the ineffective management, outdated system of the factory, Inadequate Monetary and Non-monetary

rewards, unsafe and unfavorable working environment and the Insufficient and ineffective co-workers. Therefore, it can be hypothesized that:

H5 Working environment has positive relationship with worker’s productivity in the RMG sector of Bangladesh

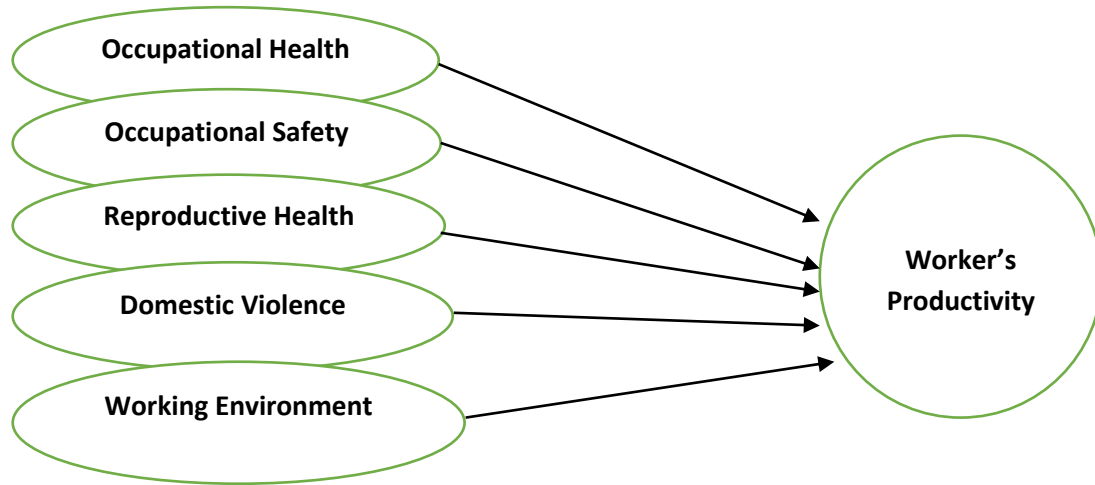


Figure 1
Conceptual Framework

3. Methodology

This is an empirical study to explore the health and safety hazards, reproductive health and domestic violence of female workers and their impacts on worker’s productivity of RMG sector of Bangladesh.

3.1 Sampling

The structured questionnaire was developed to conduct a cross sectional survey to collect data from female garments workers who are working in different ready-made garments company of Bangladesh. The sample size was statistically significant. Mundfrom, Shaw and Ke, (2005) argued for factor analysis the sample size would be appropriate if the size is 3 to 20 times the number of variables and absolute ranges from 100 to over 1,000. Using the G*power program for sample size sufficiency (Faul, F et al. 2009), the minimum sample size was determined to decide the required number of respondents for the study. Barclay et al. (1995) specified a 10-times sampling rule, in which 10 is multiplied by the maximum number of formative indicators used in the SEM method. Given these rules, the study requires 460 (10 × 46) respondents as the number of items is 46.

3.2 Data Collections

The data were collected from 551 respondents of 44 garments factories of Dhaka division and after cleaning and preliminary screening, finally the valid responses are 493. Respondents were randomly selected from all types of factories irrespective of their size and compliance issues. The collected data tested by using Structural Equation Modelling (SEM) techniques with SMART PLS-4.0. They have pointed out that SEM would provide a much better explanation of the complex situation. Similarly, Sachan and Datta (2005) emphasized the use of SEM for more in-depth analysis. However, at the very beginning a pilot research has been conducted to finalize the questionnaire. To get the actual number of items Indicator Reliability, Construct Reliability & Validity (Cronbach's alpha, Composite reliability, Average variance extracted (AVE)) has been analyzed (Hair, J.F et al. 2014). This study also examines the Discriminant Validity: Heterotrait-Monotrait (HTMT) criterion, Structural Model Path Coefficients and the *f*² Effect Size.

3.3 Measures

Data gathered through a survey questionnaire in order to test the conceptual model. The survey instrument has two parts. In the first part of the questions included the demographic part of the respondents and the second section included survey questionnaire. In this study, five constructs were measured, and each construct was measured by a number of items that were appropriately modified and adapted from earlier studies. Domestic violence 8 items (Giesbrecht C. J. 2022; Castro-González et al. 2016; Johnson, P. R., & Indvik, J. 1999), Occupational Health 10 items (Khan, et al. 2016), Occupational Safety 7 items (Ahmed, et al. 2020), working environment 6 items (Rivai et al. 2019; Masharyono, Sumiyati, and Toyib 2016), and Reproductive Health 7 items (Hossain, I. 2018) were adopted from previous studies to measure their impacts on worker's productivity 8 items (Katsuro, et al. 2010; Masharyono, Sumiyati, and Toyib 2016; Rivai et al. 2019). The developed questionnaire then translated into Bangla language so that the respondents can easily understand the questions. Respondents were asked to state their agreement of each of the statement on a five-point Likert scale (1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, and 5-Strongly Agree) to measure the impacts of independent variables (domestic violence, occupational health, occupational safety, working environment, and reproductive health) on dependent variable (worker's productivity).

4. Analysis and Discussions

4.1 Descriptive Analysis

4.1.1 Respondents' Demographic Characteristics

A total of 493 respondents (all are female) were considered as valid responses for subsequent analyses. In summary, out of the 493 respondents, the highest 208 (41.92%) are in the 25-30 years range and only 6 persons (1.27%) aged above 41 years. Considering the marital status, 385 (77.86%) are married and 85 (17.24%) are unmarried. The remaining are widows, divorced, and separated. We found the highest number of respondents' education level 207 (47.29%) is secondary and 162 (32.85%) is primary. A nominal number is highly educated graduates. A significant number of workers received training: 201(75.86%) and 135 (68.06%) are skilled & semi-skilled, 98 (19.96%) are experts, and a few 59 (11.98%) are novices and unskilled. It is a fact that a good number of workers, about 50% have 5 to 8 years of experience in this field. Among them, almost 263 (56.08%) earn average monthly BDT 8,000 to 12,000 per month and 66 (13.43%) earned monthly BDT 15,000 above.

Table 1

Demographic Characteristics of the Respondents (n = 493)

Respondents' Demographic Profile	Valid (n)	Proportion of sample (%)
Gender		
Female	493	100
Total	493	100
Age Group		
15-18	14	2.90
19-24	192	39.03
25-30	208	41.92
31-35	55	11.07
36-40	18	3.81
41 Above	6	1.27
Total	493	100
Monthly Income		
Less Tk. 5000	-	-
Tk. 5000-8000	23	4.72

Tk. 8000-12000	263	53.36
Tk. 1200-15000	141	28.49
More than Tk. 15000	66	13.43
Total	493	100
Education Qualification		
No Education	28	5.63
Primary	162	32.85
Secondary	207	41.92
Higher Secondary	80	16.33
Graduate	16	3.27
Total	493	100
Working experience in this factory (Year)		
1-2 Years	153	31.03
2-4 Years	110	22.33
4-6 Years	89	17.97
6-8 Years	55	11.25
Above 8 Years	86	17.42
Total	493	100
Skill level		
Unskilled	19	3.81
Novice	40	8.17
Semi-Skilled	135	27.22
Skilled	201	40.84
Expert	98	19.96
Total	493	100
Training Received		
Yes	374	75.86
No	119	24.14
Total	493	100
Marital Status		
Married	385	77.86
Unmarried	85	17.24
Widow	8	1.63
Divorcee	9	2.00
Separation	6	1.27
Total	493	100
No. of Children		
No Child	94	19.06
One	206	41.74
Two	82	16.70
Three	17	3.45
More than 3	3	0.54
N/A (Unmarried & no child)	91	18.51
Total	493	100
Child Care		
Own Mother with her	75	15.24
Mother-in-law with her	55	11.25
Own Mother at home district	68	13.79
Mother-in-law at home district	28	5.63
Daycare	21	4.36
Self	50	10.16

Who have no child	196	39.57
Total	493	100

Source: Authors' Calculation

The study has found 288 (58.44%) have 1 or 2 children and 91 (18.51) have no children because they are unmarried. Among 226 workers, 130 (26.49%) children live with them in a working station and those children are taken care of by their own mother and mother-in-law. A few, 21 (4.36%) stay in day-care, 50 (10.16%) stay alone because they are above 12 years old and the remaining are living in their home district with their mother and mother-in-law.

The study has found 147 (29.76%) aged between 15-18 years and 106 (21.42%) aged between 19-21 years when they gave birth their first child. Married workers 257 (54.11%) are living with their husbands, children, and parents; the remaining unmarried are living in their own district. Almost every female worker has a minimum of 2 or 3 dependents. We found 257 (52.27%) have 3-4 dependents and 88 (17.97%) have 5-6 dependents.

4.2 Result, Discussion and Findings

4.2.1 Occupational Health

To know occupational health situation in the RMG sectors, the respondents has been asked about the workplace ventilation system, prevention of dust and fume, effective measures for disposal of wastes, space for worker at the workplace, sufficient lighting system, available pure drinking water, sufficient number of separate hygienic latrine and urinal, availability of sufficient number of dust bean and Spittoon, and mask or face cover provided by factory. In this research, a total of 493 respondents gave their opinion individually through interviews. For every factor/question, respondents have 5 options for giving their opinion. The options are strongly disagreed -1, Disagree - 2, Neutral -3, Agreed- 4 and strongly agreed -5. The highest number of 300 (60.85%) respondents were strongly agreed that the factory has sufficient number of separate hygienic latrine and urinal and second most 260 (52.73%) respondents were strongly agreed that the factory has sufficient number of dust bean and spittoon available in the factory premises. The third and the fourth highest responses were 215 (43.61%) for pure drinking water and 213 (43.20%) for ventilation system. However, on an average 8% to 10% respondents were either disagreed or neutral in responses of 9 questions under occupational health and hygiene. The details are in the following graph.

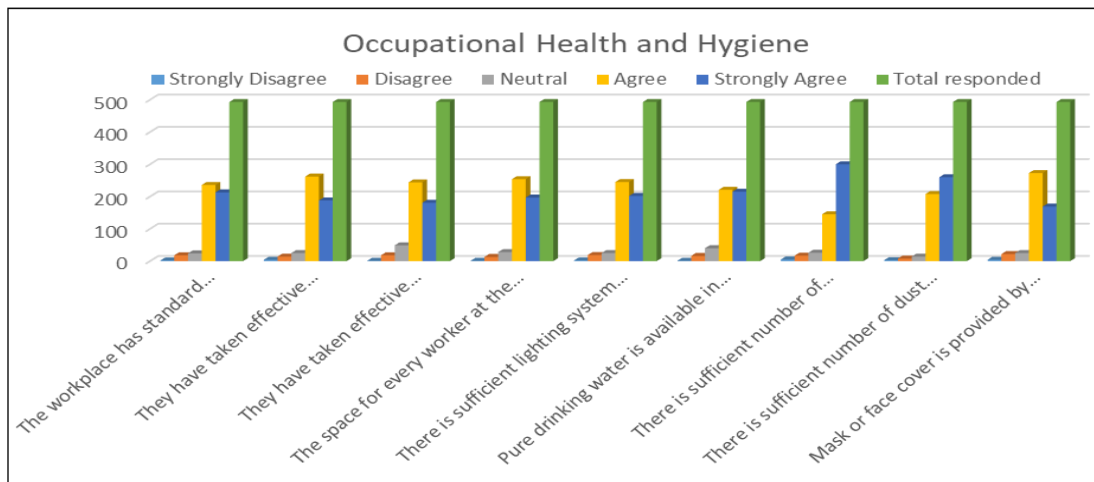


Figure 2
Occupational Health

Source: Authors' Calculation

4.2.2 Occupational Safety

To know the present situation of occupational safety, the field worker collect data from the RMG workers of Bangladesh through a set of nine questions/ statements which includes the regular inspection of building safety, availability of sufficient firefighting apparatus and alternatives exist, testing fire alarm and fire extinguishers and trained workers to operate fire case and fire extinguisher, dangerous part of machinery securely fenced by the safeguards, trained worker handle risky machinery, use protective equipment such as goggles. The respondents were answered on a five-point Likert scale and out of these nine items, most of the respondents 448 (90.87%) were agreed with the regular basis fire alarm test conducted by the factory followed by fire extinguishers operation training 444 respondents (90.06%). However, the lowest positive responses 346 (70%) given to the hoist and lift are made of sound material and properly maintained on regular basis. The details are in the following graph.

4.2.3 Working Environment

The working environment of ready-made garments factories were measured by asking about whether the company has sufficient supply of first-aid appliances, properly maintain of safety record book, Supervisor treat them positively and they have opportunity to learn and grow. The respondents also gave their opinion on their factory’s canteen facilities, adequate and suitable rest rooms, prayer room and lunch room. Highest number of respondents 465 mentioned that their company have sufficient supply of first-aid appliances, 410 respondents believe that their factory has adequate rest rooms, prayer room, and lunch room. 375 agreed with safety record book maintenance, 377 agreed with supervisor treat workers positively and helping to learn and grow, 385 agreed with factory canteens with proper food supply chain, 379 agreed with child and daycare facilities. The following and table graphs shows the details of the working environment. The details are in the following graph.

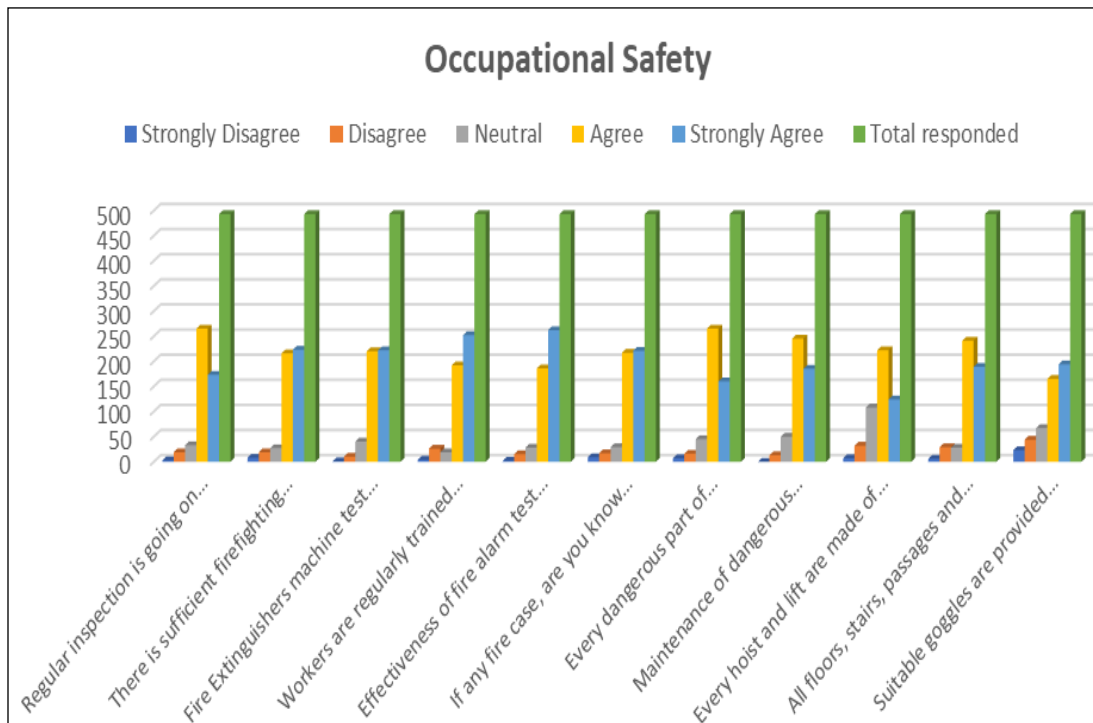


Figure 3
Occupational Safety
Source: Authors’ calculation

4.2.4 Reproductive Health

One of the objectives of this study is to know the reproductive health status of the RMG workers. The RMG workers have been requested to give their opinion about the some of the factors related with reproductive health. To measures reproductive health seven statements were present to the respondents those are office hours and working environment affected reproductive health, company policy influences the worker’s family planning decision, possibility of miscarriage for the non-supportive working environment, women workers are free to take pregnancy decision, women are enjoying full six months of maternity leave without losing the job, women workers are hiding their pregnancy status from office, Pregnant women are discriminated by the office. Highest number of respondents 432 believe that they can freely take their pregnancy decision without office intervention however 61 respondents believe that they were not free to take their pregnancy decisions. The second highest 417 respondents mentioned that pregnant women are discriminated by the office followed by 410 women workers are hiding their pregnancy status from office. However, noticeably 225 respondents did not believe that women are enjoying full six months of maternity leave without losing the job. Moreover, 169 respondents opinioned that there is a possibility of miscarriage for the non-supportive working environment. The details are in the following graph.

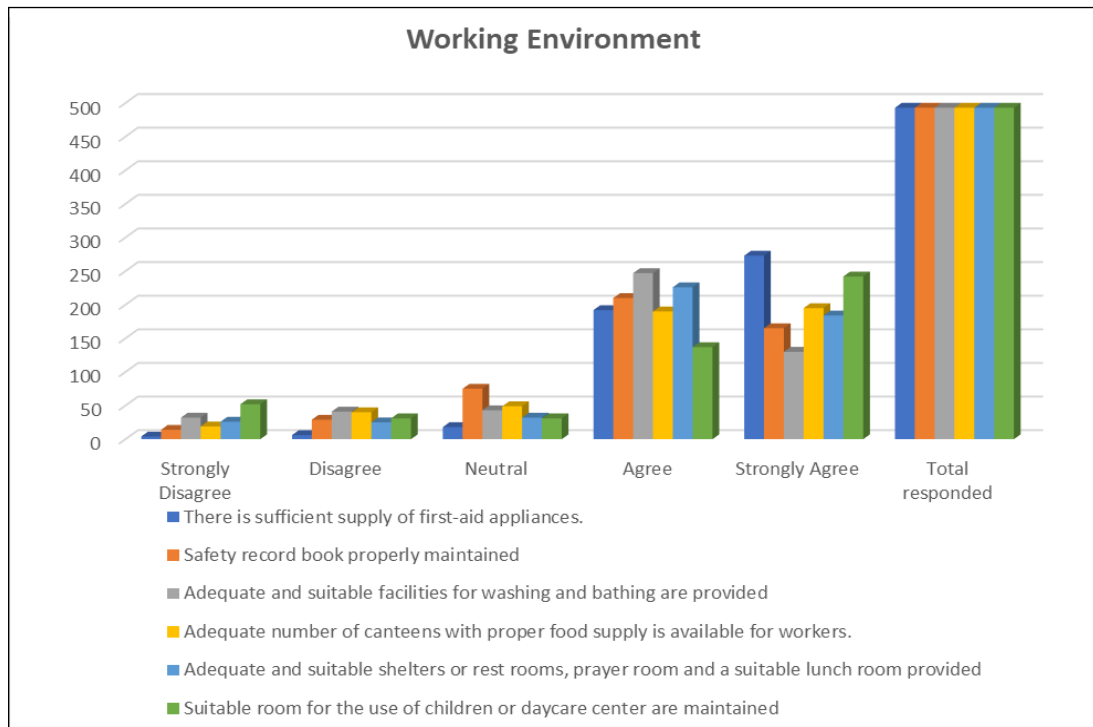


Figure 4
Working Environment

Source: Authors’ calculation

4.2.5 Domestic (Intimate Partner) Violence

Previous literature shows that workers are the victims of domestic violence. To know the domestic violence status of the ready-made garment’s workers, eight statements have been presented to 493 garments workers and their responses were divided into five options. Most of the respondents 436 were agreed with the first statement that women have freedom to expenses their income freely without intervention of her partners/relatives. The second highest positive responses 386 about husbands and

parents keep interfering with normal day-to-day official assignment or for any other cause. The third highest responses 368 mentioned that their husband refuses to give their money for household expenses even when they have money for other things. However, the lowest 207 respondents positively agreed with modernization and urbanization have affected the frequency of violence between husband and wife in your community. The details are as follows in the graph.

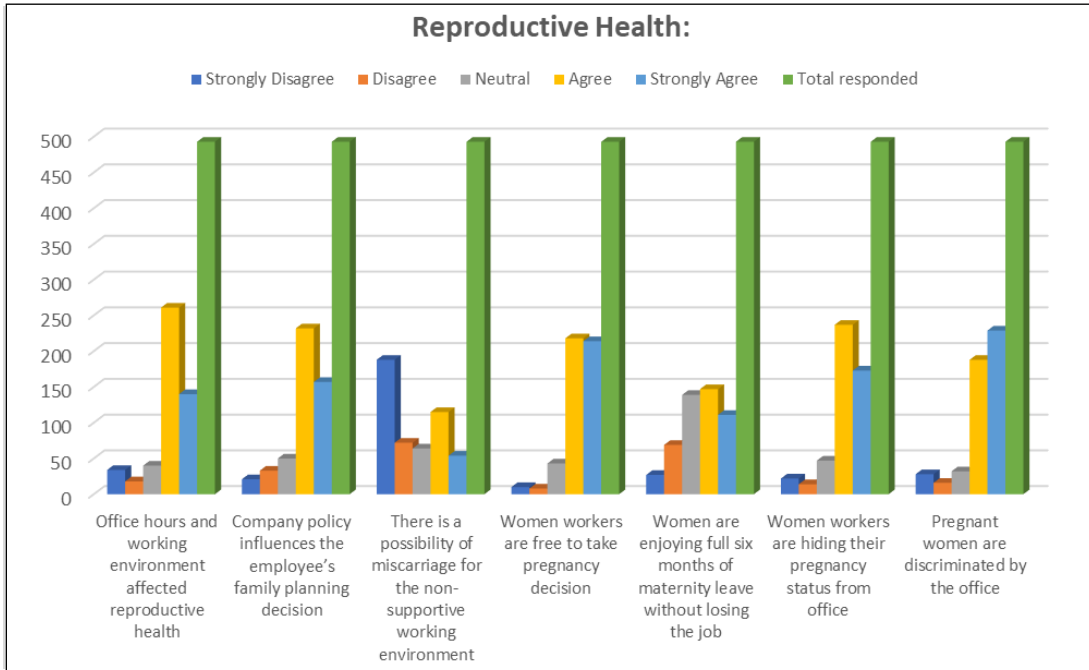


Figure 5
Reproductive Health
Source: Authors' calculation

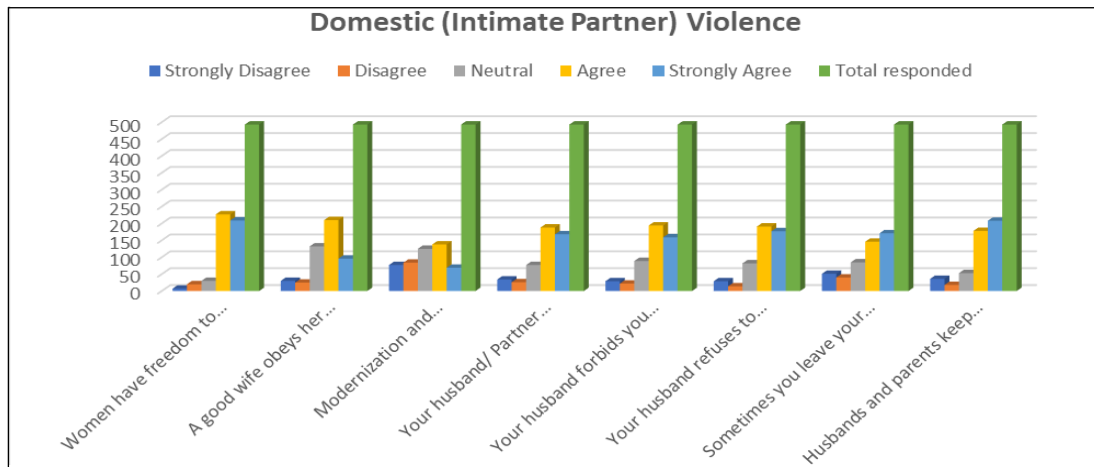


Figure 6
Domestic Violence
Source: Authors' calculation

4.2.6 Worker's Productivity

Worker's productivity is influenced by different environmental issues, occupational safety and health issues, reproductive health and domestic violence. To measure how worker's productivity influenced, there were eight statements place to the 493 respondents for their opinions. Most of the respondents 457 believe that proper lighting, ventilation and available space foster their ability to take workload. The second highest number of 431 respondents mentioned that presence of safety equipment and hazard prevention facilities increases their productivity and the third highest 424 respondents mentioned that the sound reproductive health positively related with physical and mental health which increases their productivity. The lowest number of respondents 195 believe that intimate partner valances create psychological trauma which lower my productivity. The details are in the following graph.

4.3 Model Assessment and Findings

To assess the predictive capabilities of the model, Smart PLS 4.0 was used for this study. Partial Least Squares (PLS) based Structural Equation Modeling (SEM) is a soft modelling technique that is used for predicting key target constructs, maximizing the amount of variance between the predictor latent variables. The PLS-SEM based measurement and structural models' results indicate the model's predictive capabilities.

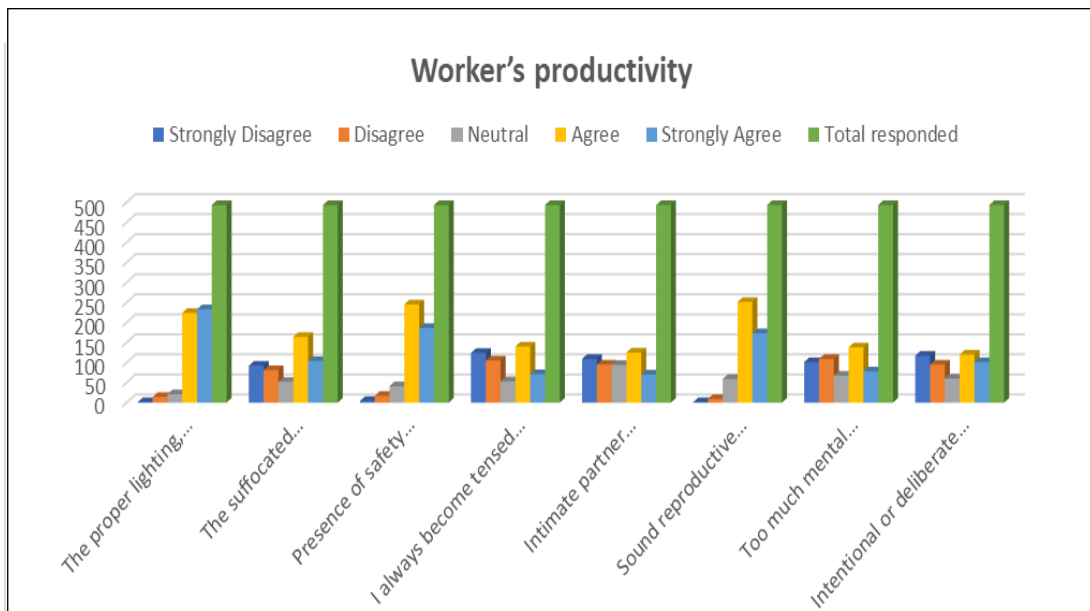


Figure 7

Worker's Productivity

Source: Authors' calculation

4.3.1 Analysis of the Measurement Model

4.3.1.1 Indicator Reliability

Indicator reliability of each item in the measurement model is measured by examining the items' loadings of measured indicators. The size of the outer loadings of the indicators of reflective constructs is also commonly considered as indicator reliability. Higher outer loadings on a reflective construct indicate that the associated indicators of that construct have much in common (Hair Jr et al. 2017). The standardized outer loading values of each indicator should be at least 0.70.

Table 2
Indicator Reliability Results

Factors	Items	Item Loading
Domestic Violence	DV_4	0.795
	DV_5	0.766
	DV_7	0.748
	DV_8	0.800
	OH_3	0.809
Occupational Health	OH_4	0.704
	OH_5	0.779
	OH_6	0.765
	OS_1	0.755
Occupational Safety	OS_2	0.745
	OS_3	0.713
	OS_4	0.724
	OS_5	0.752
	OS_6	0.723
	OS_7	0.712
	OS_10	0.758
Working Environment	WE_1	0.697
	WE_3	0.789
	WE_4	0.844
	WE_5	0.789
	RH_2	0.724
Reproductive Health	RH_4	0.733
	RH_6	0.817
	RH_7	0.757
Worker's productivity	WP_1	0.823
	WP_3	0.775
	WP_6	0.776

Source: Authors' calculation

Based on the analysis results in Table 2, the loadings of all indicators of the measurement model except OW 01 range between 0.71 and 0.82, which exceeds the recommended threshold of 0.70. It is noted that indicators showing outer loadings between 0.40 and 0.70 should be considered for removal if deleting leads to improved composite reliability (CR) or average variance extracted (AVE) values (Hair Jr et al. 2017). An indicator should always be deleted if it has very low outer loadings, <0.40 (Hair Jr, Ringle, and Sarstedt 2011). Although the outer loading of OW 01 is 0.697, indicating below the threshold but the deletion of this item does not have significant impact to improve either CR or AVE values. Therefore, the statistical results contend that all items have satisfactory indicator reliability.

4.3.1.2 Construct Reliability & Validity

In PLS-SEM, the reliability of the internal consistency of primary reflective measurement models is evaluated by Cronbach's alpha and Composite reliability; and validity by convergent validity and discriminant validity.

Table 3 exhibits that both composite reliability (CR) and Cronbach's alpha value for all constructs exceeded the upper value (0.70); demonstrating that all constructs are reliable (Hair Jr et al., 2016). Moreover, the Average variance extracted (AVE) value of all constructs exceed the recommended value, 0.50 (Hair Jr et al. 2016) that representing the satisfactory convergent validity for all constructs in the measurement model.

Table 3
Construct Reliability & Validity Results

Construct	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Domestic Violence	0.746	0.757	0.526
Occupational Health	0.766	0.782	0.553
Occupational Safety	0.885	0.885	0.567
Working Environment	0.751	0.773	0.535
Reproductive Health	0.756	0.757	0.524
Worker's productivity	0.741	0.767	0.582

Source: Authors' calculation

4.3.1.3 Discriminant Validity: Heterotrait-Monotrait (HTMT) criterion

In this study, Heterotrait–Monotrait ratio (HTMT) criterion was used to analyse the discriminant validity. In table 4, the reported HTMT value of each construct ranged between 0.305 and 0.893 which is below the threshold of 0.90 (Henseler et al., 2015). Thus, no discriminant validity issues among the constructs were observed according to Heterotrait–Monotrait ratio (HTMT) criterion.

Table 4
Heterotrait-Monotrait Ratio of Correlations (HTMT) Criterion

Constructs	Domestic Violence	Occupational Health	Occupational Safety	Working Environment	Reproductive Health
Domestic Violence					
Occupational Health	0.657				
Occupational Safety	0.548	0.873			
Working Environment	0.305	0.723	0.741		
Reproductive Health	0.306	0.481	0.506	0.548	
Worker's productivity	0.309	0.572	0.515	0.513	0.583

Source: Authors' calculation

4.3.1.4 Evaluation of the Structural Model and Findings

Once the measurement model is reliable and valid, the next step is to evaluate the structural model results. According to PLS-SEM, primarily the structural model is assessed by the model's predictive capabilities. Here, the model is assessed in terms of how well it predicts the endogenous variables. In PLS-SEM, the recommended criteria for structural model evaluation is the significance of the Path Coefficients, R^2 values (coefficients of determination), f^2 (the effect size), and Q^2 (predictive relevance).

4.3.2.1 Coefficient of Determination (R^2 Value)

Coefficient of determination (R^2) represents the structural model's predictive strength by examining the combined effects of exogenous variables on endogenous variables (Hair Jr et al. 2017). This result represents the amount of variance of an endogenous construct explained by the exogenous constructs belonging to it. In social science research, R^2 values of 0.75, 0.50, or 0.25 for endogenous latent variables could be described as substantial, moderate, or weak (Hair Jr et al. 2017, Hair Jr, Ringle, and Sarstedt 2011, Henseler, Ringle, and Sinkovics 2009), even though R^2 value of 0.20 is also considered as high in consumer behavior researches such as customer satisfaction or loyalty (Hair Jr et al. 2017).

In the current study, SmartPLS algorithm were used to obtain R² value and R² results of the structural model are summarized in Table 5.

Table 5
Coefficient of Determination (R²) Results

Construct	R - Square (R ²)	R Square- Adjusted
Worker's productivity	0.548	0.543

Source: Authors' calculation

Table 5 reports that Worker's productivity as an endogenous construct explained the highest of 54.8% variance by its related exogenous constructs such as domestic violence, occupational safety, working environment, and reproductive health. According to the rule of thumb, R² values of Worker's productivity (0.548) can be considered moderate.

4.3.2.2 *The f² Effect Size*

The effect size of *f*² represents the changes of R² value of an endogenous construct if a specified exogenous construct is omitted from the model. In PLS, *f*² effect size is evaluated using the PLS Algorithm in which *f*² values of 0.02, 0.15, and 0.35 respectively are considered small, medium, or large effects of exogenous constructs on an endogenous construct (Hair Jr et al. 2017, Cohen 1988), while *f*² values of less than 0.02 indicates that there is no effect. Table 6 displays *f*² values of endogenous construct in the columns and corresponding exogenous constructs in the rows.

Table 6
The f² Effect Size Results

Construct	Domestic Violence	Occupational Health	Occupational Safety	Working Environment	Reproductive Health	Worker's productivity
Domestic Violence						0.007
Occupational Health						0.132
Occupational Safety						0.001
Working Environment						0.001
Reproductive Health						0.085

Source: Authors' calculation

Table 6 shows that occupational health and reproductive health have small to medium effect size of 0.132 and 0.085 on Worker's productivity whereas domestic violence, occupational safety and working environment have effects 0.007, 0.001, 0.001 on Worker's productivity which are considered no effect size (less than 0.02) on Worker's productivity. Finally, among all the exogenous driver constructs of Worker's productivity, only occupational health and reproductive health have small effect but other variables do not have any significant effect on Worker's productivity.

4.3.2.3 *Structural Model Path Coefficients*

In the structural model, the path coefficients represent the hypothesized relationships among the constructs. Path coefficient relation between two latent constructs, exogenous and endogenous, allow researchers to understand the strength of the relationship between them, and also allow to confirm or disconfirm each hypothesis based on this relation. Here, using the SmartPLS algorithm and bootstrapping outputs, the relationships between two latent constructs and the significant level of their relationships were determined. The path coefficients estimation close to +1 represents strong positive relationships while close to 0 represents weaker relationships at a statistically significant level. This path assessment results determine whether the proposed hypotheses are to be accepted or rejected. Table 4 shows the path coefficients results, t-statistics, and significance level of each hypothesized path.

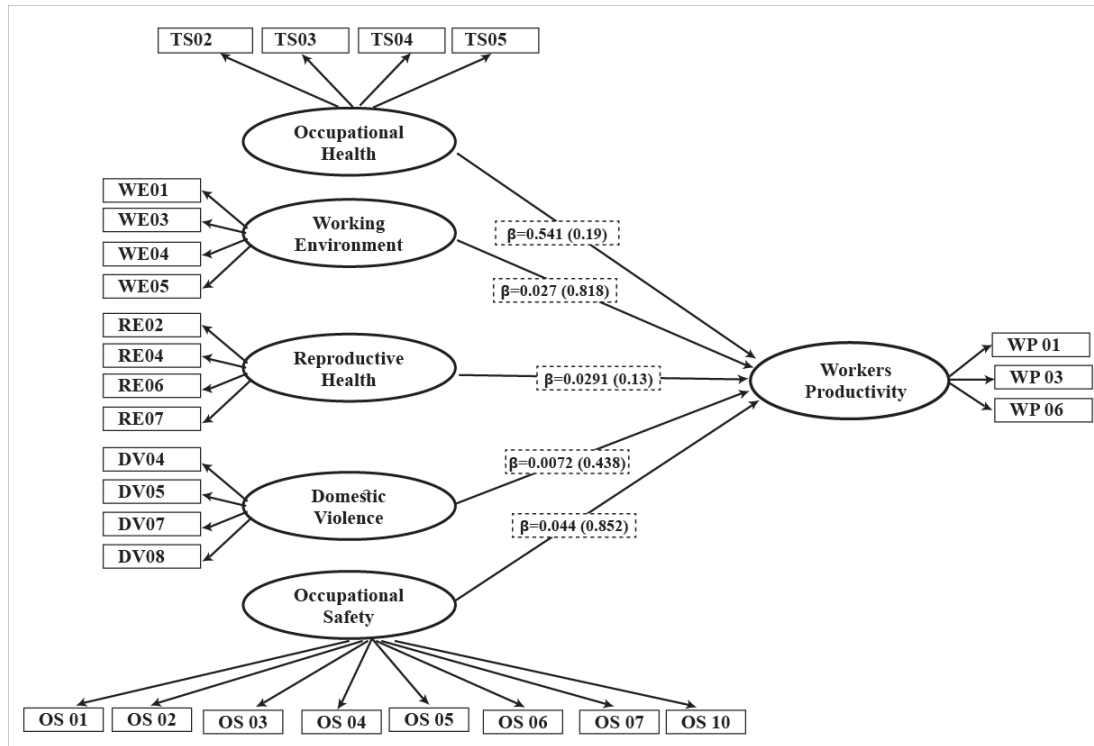


Figure 8
Structural Model and Path Coefficient Results
Source: Authors' calculation

Table 7
Path Coefficients Results for the Structural Model

	Path Direction	Std. β Value	Standard Deviation	t-Value	p-Value	Hypothesis Test
H 1	Domestic Violence→ Worker's productivity	0.072	0.094	0.775	0.438	Rejected
H 2	Occupational Health→ Worker's productivity	0.541	0.231	2.339	0.019	Accepted
H 3	Occupational Safety→ Worker's productivity	0.044	0.237	0.186	0.852	Rejected
H 4	Working Environment→ Worker's productivity	0.027	0.117	0.231	0.818	Rejected
H 5	Reproductive Health→ Worker's productivity	0.291	0.117	2.493	0.013	Accepted

Source: Authors' calculation

Table 7 reported all path coefficient (β) values in the structural model. The results indicated that workers' occupational health ($\beta=0.541$, $t=2.339$, $p<0.019$) and reproductive health ($\beta=0.291$, $t=2.493$, $p<0.013$) both had a positive influence on the Worker's productivity. The result shows that H2 and H5 accepted and H1, H3 and H4 are rejected. The findings indicate that workers' occupational health and reproductive health can ensure the Worker's productivity. This means that if a worker bears good health, he/she can enhance the productivity of a firm. The result shows that enhancing workers' occupational health will leads to increases 54.10 percent worker's productivity similarly

increase worker's reproductive health will leads to increases 29.10 percent workers' productivity. However, workers' domestic violence, occupational safety and working environment did not have significant influence on the worker's productivity ($\beta=0.072$, $t=0.775$, $p=0.438$; $\beta= 0.044$, $t=0.186$, $p=0.852$; $\beta=0.027$, $t=0.231$, $p=0.818$). The result shows that workers' domestic violence, occupational safety and working environment has positive influences on worker's productivity by 7.20 percent, 4.4 percent and 2.7 percent respectively.

5. Recommendations

To improve productivity, first of all ensure comfortable working environment such as proper lighting, ventilation and presence of safety equipment and hazard prevention facilities. Secondly, develop positive mindset among the management level employees and ensuring maternity related leaves and other benefits policies for sound reproductive health. Organizations can create and cultivate a culture that is supportive of workers who have been impacted by domestic violence through training, policy, and information disseminated in the workplace. Demonstrated buy-in from leadership is necessary for instigating a culture shift.

Moreover, the RMG factories should setup a counselling center for women workers to give advice and suggestion to handle the domestic violence and reproductive health. Everyone in the workplace must have access to information about intimate partner violence (IPV) or domestic violence (DV) and locally available supports. Information on how to recognize DV, how to respond, referral sources, and information on the workplace's policy should be available in all workplaces, to be easily accessed by workers who are experiencing DV as well as coworkers and managers. Any worker who is affected by violence (survivors, perpetrators, or coworkers) should be able to access information and support at work.

Finally, it can be concluded that RMG industry of Bangladesh will be more competitive in the international market with more productive and healthier workforces.

6. Limitation and Suggestions for Future Research

In interpreting the findings and implications some limitations need to be considered. First of all, this study was limited to the readymade garments worker's occupational health, occupational safety, working environment, reproductive health, domestic violence and worker's productivity and the data has been collected from RMG factories located in Dhaka division of Bangladesh and then generalize the outcomes for the entire garments industry of Bangladesh. This research was analyzed based on quantitative data using a structured questionnaire. For in-depth study, future research may be done on qualitative analysis by collecting opinions from the participants. The future study may also include the worker's nutrition intake as independent variable to enhance worker's productivity.

7. Conclusion

Bangladesh RMG sector has already done a great job in women empowerment and export earnings. To get competitive advantages, Bangladesh readymade garments mostly depends on worker's productivity. The study result suggests that to improve worker's productivity, the factories need to be more concerned about improving occupational health and reproductive health of women workers of readymade garments factories. However, occupational safety, working environment and domestic violence have also contribute to improve the worker's productivity but not significant level. According to Maslow's hierarchy of needs theory, to satisfy physiological needs and then safety needs motivate workers to improve worker's productivity. Moreover, to address reproductive health and domestic violence in some aspects also help to partially fulfill physiological, safety and social needs. The mindset of management level workers should be positive about reproductive health of workers and develop and implemented policies to support reproductive health issues. Worker's counseling or support center may help workers to handle the domestic violence issues more effectively and reproductive health awareness program may improve the worker's reproductive health.

The outcomes of the study guide the policy makers, owners and managers of readymade garments factories to create a better working environment and a healthier workforce for continuous improvement in RMG sectors. As this study did not cover all the aspects which influence RMG workers productivity, therefore further in-depth study can be done in different context or same context with different approach.

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