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Original Article

The Current Working Conditions in Ugandan Apparel Assembly Plants

Mike Tebyetekerwa [1,2,*], Nicholus Tayari Akankwasa [2,3], Ifra Marriam [3,4]

[1] College of Material Science and Engineering, Donghua University, Shanghai, PR China
[2] Faculty of Science, Kyambogo University, Kampala, Uganda
[3] College of Textile Science and Engineering, Donghua University, Shanghai, PR China
[4] College of Textile Engineering, Mehran University of Engineering and Technology, Jamshoro, Pakistan

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ABSTRACT

Background: The present rapid shift of industrialization from developed to developing countries requires developing countries to understand issues related to work organization, management, and working conditions. There are many factors slackening production, of which working conditions is part. A complete inquiry into the workers' working conditions can enable managements to reduce risks in the workplaces and improve productivity. Understanding and awareness of the benefits of workplace research and a probe into the working conditions in the Ugandan apparel assembly plants are urgently required.

Methods: A total of 103 (70 women and 33 men) workers from five different plants were interviewed. Together with the top management of various plants, questionnaires about the workers' opinions of their physical working conditions were prepared. Data was collected using two methods: (1) questionnaire; and (2) observation of the workers during their work.

Results: The results indicated that poor plant working conditions were mainly contributed by the workers' social factors and the management policies.

Conclusion: The government, together with the management, should work to improve the working conditions in the apparel assembly plants, as it greatly affects both.

1. Introduction

The transformation of Uganda's economy over the last 15 years, with an average gross domestic product growth of 6.6%/y between 2000 and 2014, is partly due to the expansion of Uganda's manufacturing industries [1]. These include food and mineral processing, beverage production, textile and leather production, metal fabrication, fish processing, chemical and pharmaceutical production, and packaging material production industries. The apparel sector in the textile industry employs at least 2.5 million Ugandans (7.8%), mostly women and youth, across the value chain. However, this sector is considered to be underperforming, as it can employ more than two times the current number of employees at full capacity [2]. Therefore, the apparel sector is vital in improving the economy of Uganda. Moreover, this explains why for many years Uganda has been a member of various textile and clothing trading regimes that include but are not limited to the East African Customs Union (for single customs territory), Common Market for Eastern and Southern Africa (for free-trade zone), the African Growth and Opportunity Act (for enhanced market access to the USA), and others that guarantee broad market access potential for products manufactured. However, access to broad markets has been constrained by the inability to meet the demands of supply and quality of clothing required [2]. Many factors contribute to failure, but it is not clear exactly which factors are responsible. This report focuses on the workers and working conditions in Ugandan apparel assembly plants (AAPs), hypothesizing these as some of the many factors impeding production and supply thereof. The textile industry in Uganda is dominated mostly by AAPs, as the large integrated mills are vanishing out completely [2]. Despite the known fact that AAPs are labor intensive, mostly in the developing countries such as Uganda, the occupational health and safety programs focus only on the large-scale industries [3]. Therefore, for economic growth, increased efforts are needed in the development of such

* Corresponding author. College of Material Science and Engineering, Donghua University, Building C, Office C420, 2999 North Renmin Road, Songjiang University District, Shanghai 201620, PR China.
E-mail addresses: miketebyeks@mail.dhu.edu.cn; mketebyeks@outlook.com (M. Tebyetekerwa).

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small-scale industries [4] by a thorough understanding of all the factors impeding productivity, of which working conditions of the workers are of great importance. There are no published studies that focus on the ergonomics and working conditions implemented in the AAPs in Uganda, although the Ministry of Labor clearly advocates for safety of workers at the workplace.

AAPs involve fabric cutting, making, and trimming of different fashion garments [5]. These activities are known to be characterized by unnatural work postures with repetitive actions that require strong visual demands. Therefore, workers are often susceptible to musculoskeletal disorders (MSDs) due to the nature of their jobs. From an ergonomics points of view, the high prevalence of MSDs exposes workers to much physical and emotional suffering. This thus results in high compensation costs and downtime. The increased downtime decreases productivity and overall efficiency [6–9]. The prevalence of MSDs in AAPs has been previously reported by different researchers [6,9–14], and the apparel industry is known to have many cases of MSDs as compared with other manufacturing industries [15]. Within different reports, workers in AAPs were found to have little or no control over their work assignments, pace, and schedule. Their employment was often unstable and involved tight delivery schedules with few rest breaks [6,14]. In addition, the workers are required to perform their work on a predesigned workstation. Therefore, work is done in awkward postures with the same motions being performed repeatedly [16]. Thus, it is of great importance to understand work-related MSDs as they affect the workers' health substantially and therefore have a considerable adverse effect on the economic and profit factors such as the impact on production and revenues [11]. The apparel sector, therefore, requires continuous workplace evaluation for complete tackling of workplace risks and injuries for enhanced productivity.

Work-related MSDs are common occupational diseases in industrialized countries [12]. They have also been identified in the European Union as a major problem regarding ill health, productivity, and associated costs of the workers [11]. This study probes into the working conditions in AAPs in Uganda. The report is the first of its kind about the working conditions in the country. In this study, working conditions of the workers are evaluated along with some related social factors. The information presented in this report should be treasured by the apparel management, workers, health-care providers, and policy makers. We think that our results can improve working conditions of the workers as well as their health, improve production of the apparel plants, and therefore meet the country's major development goals by 2020 and also act as a base for the policy makers to make decisions.

2. Materials and methods

2.1. Study design and procedure

The complete investigation and study took 6 months (from February to July 2015). Data on the total number of AAPs in Uganda were obtained from the Uganda Ministry of Gender, Labor, and Social Development. In the data provided, 150 firms were registered; among these firms, 10 had all the different departments required (drafting, cutting, assembly, pressing, and finishing) with more than 25 workers. These 10 firms were located in Kampala and Jinja. A possible reason for choosing these sites would be because these are the most industrialized areas in the country. Stratified sampling was done among the selected 10 firms and five firms we selected for this study. Five representatives in each workplace, including four workers who were randomly selected from the sections of drafting, cutting, assembly, pressing, and finishing department and one department manager, completed the survey in their respective organizations. Total workers in different plants were 103 (70 women and 33 men). A total of 103 questionnaires were thus distributed, and all the 103 workers returned completed surveys (response rate = 100%). Together with the top management of different plants and based on previous studies [8–10,13,14], we prepared the questionnaires about the workers' opinions of their physical working conditions. In all workplaces, teaching lasting for at least 30 minutes was conducted for the workers to help them understand the essence of the research, familiarize them with the questionnaire, and educate them about work-related health problems and symptom recognition to achieve better responses. A written informed consent form was signed by each worker before participation in the study. The workers were volunteers and were not promised or given any rewards for their efforts. The agreement with the management to perform a follow-up study was not guaranteed and was not performed. The study procedure was reviewed and approved by the Senate Research Committee of Kyambogo University.

2.2. Data collection

In this participatory and cross-sectional study, data were collected using both questionnaire and direct observation of the study participants during their work. Arrangements were made before the researchers visited each plant for data collection. The first section of the questionnaire covered demographic aspects such as age, sex, marital status, and education level of the workers. The second section of the questionnaire assessed the prevalence of work-related MSDs of the workers. MSDs of different body regions during the past 12 months were determined using the Standardized Nordic Questionnaire [17]. The respondents were asked to indicate if they had experienced any ache, pain, or discomfort in the different body regions using the body map illustrated in Fig. 1. The

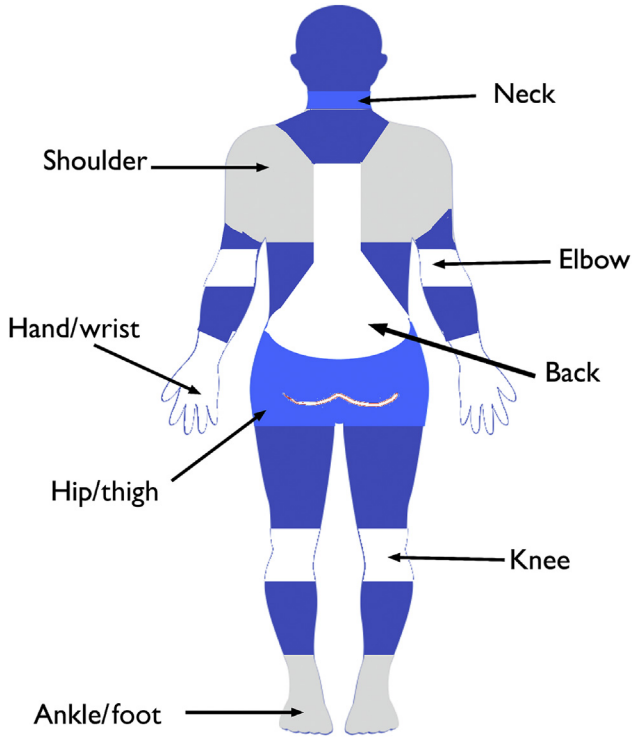

Fig. 1. The body map of musculoskeletal regions based on the Standardized Nordic Questionnaire [17]. Note: In the questionnaire and results, "Other discomforts" means musculoskeletal disorders in elbows, knees, hip/thighs and ankles/feet.

Table 1
Demographic details of the workers in all departments ($n = 103$)

Variables	Values
Sex, *n* (%)	
Male	33 (32.1)
Female	70 (67.9)
Age (y)	
Mean (SD)	28.5 (12.2)
Range	16–63
Marital status, *n* (%)	
Married	60 (58.3)
Unmarried	43 (41.7)
Educational level, *n* (%)	
Illiterate	20 (19.4)
Primary school	50 (48.5)
Secondary school	28 (27.2)
University	5 (4.9)

last section of the questionnaire assessed psychosocial and physical work demands, which involved the job characteristics of the workers in all departments. The questions in the later section were based on the relevant literature [8–10,18–21]. These included the number of years worked as an operator, number of hours worked per day and week, pressure at work (yes/no), the work schedule (day, afternoon, or evening). Questions pertaining to the workstation design included whether the seats would adjust easily, were padded with round front, had an adjustable backrest, provided lumbar support, and had casters (with response alternatives: yes or no). In the same section of the questionnaire, questions were presented to understand the nature of the workstation including whether the work surface of the worker was adjustable (yes/no), workstation had enough space for the worker's body (yes/no), and finally whether both left-handed and right-handed individuals could use the workstation (yes/no). Finally, the workplace environmental conditions such as lighting, noise levels, and vibration levels were self-rated by the workers from comfortable (unnoticeable), occasionally uncomfortable, and distracting to frequently annoying or distracting. Observational data were also collected via the walk-through investigation.

It should be noted that before the actual survey, a pilot study was conducted on 10 participants from different plants to test the questionnaire. Some words, sentence patterns, and question flow were modified, but these were minor. In addition, the test–retest reliability of the questionnaire items was evaluated with kappa coefficients. The kappa coefficients ranged from 0.84 to 0.99, indicating excellent reliability of the measure.

2.3. Data analysis

Results from the study were analyzed using the IBM SPSS Statistics Version 24 for Mac (SPSS Inc., Chicago, IL, USA). Demographic data and job characteristics of the study population were presented as mean [standard deviation (SD)], range, and percentages.

3. Results

3.1. Sociodemographic characteristics

The total study population was 103, with 32.1% (33/103) men and 67.9 % (70/103) women. The sociodemographic characteristics are summarized in Table 1. The mean age was 28.5 years (SD = 12.2 years). The age range of the workers was from 16 years to 63 years. Most workers were married (58.3%). Among them, only 4.9% had a university education, 48.5% had primary school education, 27.2% had secondary education, and 19.4% were illiterate.

3.2. Severity of work-related MSDs

The prevalence of MSDs among workers within 12 months is summarized in Table 2. Regarding the severity of discomforts, a total of 103 discomforts were reported. Most workers had back pain (39.8%). The reported work-related discomforts in neck and shoulder were the same, each appearing in 21 workers. Only nine workers experienced wrist pain, and 11 workers experienced other discomforts other than the aforementioned ones. In total, 31.1% of workers experienced no discomfort at all, whereas no worker experienced more than three discomforts. Those who experienced at least a discomfort were the most [$n = 44$ (42.7%)]; 22 workers experienced at most two discomforts (21.3%) and only three (4.9%) workers experienced at most three discomforts.

3.3. Job characteristics

The job characteristics of AAPs including workers' experience, working hours/wk, pressure due to work, work schedule, workstation posture, nature of the seats, nature of the workstation, and the environmental conditions of the workplace are summarized in Table 3. The workers' years of experience spanned from 1 year to 11 years (mean = 3 years, SD = 1.85 years). The weekly average working hours spent ranged from 48 hours to 65 hours (mean = 57.4 hours, SD = 5.76 hours). Many workers reported that their work brought about pressure (85.4%). The majority of the participants (86.41%) worked during the day, and the remaining 13.59% worked in the afternoons. Evening working was not reported. The participants' workstation posture enabled horizontal thighs to the tune of 77.7%; vertical lower legs, 100%; footrest, 95.1%; and neutral wrists, 91.3%. As much as 14.6% of the workers' seats adjusted easily, 22.3% had padded seats, only 11.7% of the seats had an adjustable backrest, 49.5% provided lumbar support, and 15.5% had casters. Report on the nature of the workstation showed that only 19.4% of the workers had adjustable work surfaces; 53.4% of the workers reported that they did not have enough space to carry out their work; and only 50 equipment could be used by both right- and left-handed people. The environmental conditions (lighting, noise, and vibration levels) were 36.6% appropriate, 50.2% uncomfortable (lacking), and 13.2% poor. Lighting, noise, and vibrations were 75.7%, 12.6%, and 21.4% appropriate, respectively.

3.4. Observational results of the firms

The observational data in Table 4 were collected from all the five plants. The plant names are not disclosed but are named A, B, C, D, and E in this study (this was part of the consent made with the firms). In all plants except two, jobs were varied, and this depended on products and processes. These jobs were either done on an individual basis or in groups. In all AAPs, jobs were poorly organized,

Table 2
Severity of work-related musculoskeletal disorders

Severity of discomforts	
Work-related discomforts, *n* (%)	
Back pain	41 (39.8)
Neck pain	21 (20.4)
Shoulder pain	21 (20.4)
Wrist pains	9 (8.7)
Other discomforts	11 (10.7)
Number of discomforts per individual, *n* (%)	
No discomfort	32 (31.1)
At least one discomfort	44 (42.7)
At most two discomforts	22 (21.3)
At most three discomforts	3 (4.9)
More than three	0 (0)

Table 3
Job characteristics of the workers in all departments ($n = 103$)

Variables	
Workers experience (y)	
Mean (SD)	3 (1.85)
Range	1–11
Working h/wk	
Mean (SD)	57.4 (5.76)
Range	48–65
Feeling pressure due to work, *n* (%)	
Yes	88 (85.4)
No	15 (14.6)
Work schedule, *n* (%)	
Day	89 (86.41)
Afternoon	14 (13.59)
Evening	0 (0)
Work station posture, *n* (%)	
Horizontal thighs	
Yes	80 (77.7)
No	23 (22.3)
Vertical lower legs	
Yes	103 (100)
No	0 (0)
Footrest	
Yes	98 (95.1)
No	5 (4.9)
Neutral wrists	
Yes	94 (91.3)
No	9 (8.7)
Nature of the seats, *n* (%)	
Adjust easily	
Yes	15 (14.6)
No	88 (85.4)
Have padded seat	
Yes	23 (22.3)
No	80 (77.7)
Have adjustable backrest	
Yes	12 (11.7)
No	91 (88.3)
Provide lumbar support	
Yes	51 (49.5)
No	52(50.5)
Have casters	
Yes	16 (15.5)
No	87 (84.5)
Nature of the workstation, *n* (%)	
Is work surface adjustable?	
Yes	20 (19.4)
No	83 (80.6)
Is there sufficient space for the body?	
Yes	48 (46.6)
No	55 (53.4)
Can both left-handed and right-handed use it?	
Yes	50 (48.5)
No	53 (51.5)
Environmental conditions at the workplace, *n* (%)	
Lighting conditions	
Appropriate	78 (75.7)
Uncomfortable	20 (19.4)
Poor	5 (4.9)
Noise levels	
Appropriate	13 (12.6)
Uncomfortable	69 (67.0)
Poor	21 (20.4)
Vibration levels	
Appropriate	22 (21.4)
Uncomfortable	66 (64.1)
Poor	12 (14.7)

Table 4
Observational results of the plants

Observations in the plant	Plant(s)
Jobs are varied on products, processes, and were performed both individually and in groups	All except B and E
Jobs were not organized well	All
Tasks were repetitive and tended to be burdensome to workers	All
Workplace congested and sitting postures were typically uncomfortable	All
Time schedules were tight and often required hurrying in performing task	All except A
Rest pauses were few and short when taken	All except A
Seats lacked backrest	All
Seats were hard and wooden	All
Sharp bending of the neck was common, combined with sharp bending of the trunk among taller workers or moderate bending among short workers	All
Equipment, including sewing machines, was old	All
Temperatures were 3–4°C higher than the outside temperature due to lack of air conditioning in the plant	All

assignments were monotonous, and proved burdensome to the workers; workplaces were congested with uncomfortable sitting postures; seats lacked backrest, which resulted in forward leaning by workers; seats were hard and wooden; equipment including sewing machines was old; sharp bending of the neck among all workers and among tall workers was commonly reported; sharp bending of the trunk among tall workers and moderate bending among short workers were noted; and finally, all plants lacked air conditioning, which resulted in 3–4°C temperature increase within the plants as compared with outside temperatures. Only workers in one firm (A) had less tight time schedules and long rest pauses.

4. Discussion

The findings of this study convey for the first time the current working conditions in Uganda's AAPs together with the prediction of their causes. The workers' average age was 28.5 years (Table 1) with the majority being between 20 years and 29 years (Fig. 2). Among the discomforts, back pain was more dominant in workers as depicted in Fig. 3. The results are the same from all other different studies carried out in AAPs. These results provide extra evidence that MSDs are highly prevalent among AAPs workers. This is not shocking because most of these plants' activities such as sewing, pressing, and cutting are characterized by long sitting periods, forward inclined unnatural posture of the upper limbs, and repeated use of hands to control and feel objects and tools, which therefore levies unergonomic postural loadings onto the body [22]. Most workers were women (67.9%). Female employees' numbers are usually above average in AAPs [6], and this explains why more research has been directed to females as compared with males with respect to AAPs' working conditions [7–9,14]. Women are more exposed to the risks associated with work as seen in Fig. 4. Further still, many were married (58.3%). Thus, it can be understood that most worked because of the responsibilities they had, though very young, no matter what the conditions at the workplace are. These results coincide with those reported in most of the developing countries. In Bangladesh [6], Turkey [9], and Sri Lanka [14], the average age of workers in the AAPs was also reported to be <30 years. However, in developed countries such as the USA [13] and the Netherlands [7], the AAPs workers' age was relatively high and >30 years. This difference in the age of workers between the developing and developed countries can be explained by the education factor. For example, most of the workers lacked education, yet many had gone only to primary school, and only 4.9% had university degrees. Therefore, to enter the job market in Uganda, as

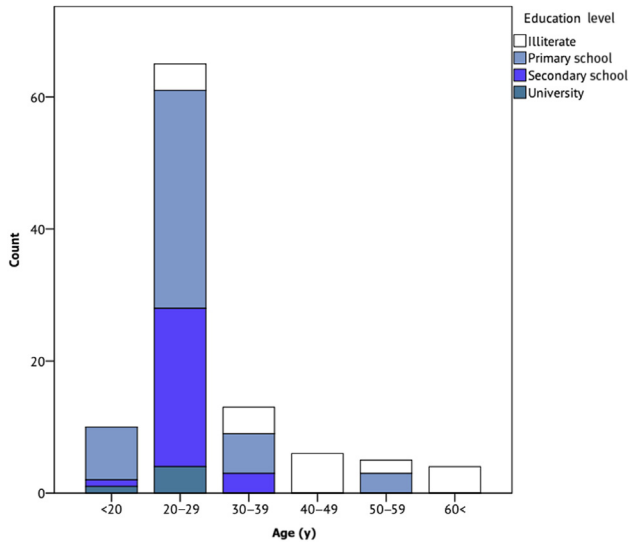

Fig. 2. Count of the education level of different age groups.

in many other developing countries, education is not a requirement as opposed to developed countries. It is worth remembering that time is usually taken for one to attain some level of education in life and this can explain why workers' age in developed countries was >30 years. Therefore, a good number of people who worked in industries in Uganda lacked the required skills, training, experience, or even awareness of industrial requirements and labor laws that include safety and health. Most workers lacked enough education and expertise required to work in a such a factory setting. These results are in line with previous findings of studies conducted among other AAPs workers [6,14].

The prevalence of work-related MSDs, hereby defined as symptoms that occurred at least one time in a month or that lasted for at least 7 days in the past 12 months, was found to be 70% and was relatively high among the study population. However, when compared with other plants, the results were slightly lower than those reported in Bangladesh [6] AAPs (72.7%) and very high as compared with those reported in Sri Lanka (15.5%) [14], as shown in Table 5. The slightly better results as compared with Bangladesh plants might not necessarily mean that Ugandan AAPs have better work conditions. Instead, this might be because of the limited sample space in this study ($n = 103$) compared with that in the study on Bangladesh plants ($n = 460$). It is also worth noting that Sri Lanka's 15% MSDs prevalence was an exception as compared to many reports on AAPs whose percentage of work-related discomforts is usually >60% [8–10,13]. The high prevalence of the back, neck, shoulder, and wrist pain reported in this study is also in agreement with different reports from previous studies in the AAPs [6,9,10]. Comparisons in Table 5 are drawn between apparel workers' occurrences of the work-related MSDs with different sectors of occupation (dentists [23,24], physiotherapists [25,26], and teachers [27,28]) in developing countries. Back pain was more prevalent among apparel workers and high as compared with all other industry sectors. This can be ascribed to the long sitting hours in awkward positions on seats lacking backrests as reported in Table 3. The percentages of the reported discomforts in AAPs are low as compared with those reported by dentists, physiotherapists, and teachers. The results might not generally mean that apparel workers suffer fewer discomforts. Instead, this might be because the apparel workers do not clearly understand the questionnaire presented to them by the researchers due to their high illiteracy and therefore reported otherwise. Compared with dentists, physiotherapists, and teachers, apparel workers are commonly nonprofessional, lacking education as ascribed by this study. This evidence indicates the need for the extensive teaching of the sample population before research on work-related MSDs is carried out.

A great percentage (68.9%) of the study population reported at least a discomfort, where the most commonly affected sex was female as depicted in Fig. 4. These results are consistent with previous studies [6,13]. The possible explanation for the sex difference observed in prevalence of MSDs might be because the number of females in AAPs is usually high. This might be because the common tasks involved are cutting, sewing, and joining, which are light physical activities more preferred by women [29]. Moreover, the body size and dimensions of women are smaller than men; additionally, they also have lower physical capacities. Therefore, when men and women perform a similar physical task, the latter will tend to have more workload [30]. This could be the reason for more reported discomforts. The other hypothesis is that different sexes perceive pain differently due to the hormonal biological mechanisms. Sex hormones such as estrogens tend to alter and reduce pain perception [31,32]. Therefore, women are more likely to report more pain than men because of low estrogens levels, especially in their stages of the menstrual cycle. All these explanations adequately fit with our study findings, in which females reported more MSDs than males in all body regions.

Most workers worked for long hours during the day and just a few during afternoon sessions. Evening sessions never existed. Work was not shift based, meaning that workers were expected to

Table 5
Comparison of occurrences of work-related MSDs with other studies in developing countries

Occupation/industry sector	Apparel workers			Dentists		Physiotherapists		Teachers	
Country	Bangladesh [6]	Sri Lanka [14]	Uganda (this study)	Thailand [23]	China [24]	Malaysia [25]	Turkey [26]	Botswana [27]	Saudi Arabia [28]
Work-related discomforts, *n* (%)*									
Back pain	285 (32.1)	94 (49.7)	41 (39.8)	112 (41.3)	228 (36.4)	30 (19.0)	87 (35)	759 (18.2)	153 (29.3)
Neck pain	156 (17.5)	11 (5.8)	21 (20.4)	83 (30.6)	–	27 (17.1)	30 (12)	733 (17.5)	101 (19.3)
Shoulder pain	160 (18.0)	15 (7.9)	21 (20.4)	61 (22.5)	200 (31.9)	23 (14.6)	39 (14)	758 (18.1)	109 (20.9)
Wrist pain	120 (13.5)	12 (6.3)	9 (8.7)	–	117 (18.7)	7 (4.4)	48 (18)	443 (10.6)	39 (7.5)
Other discomforts	168 (18.9)	57 (30.2)	11 (10.7)	15 (5.6)	81 (12.9)	71 (44.9)	57 (21)	1,488 (35.6)	120 (23)
Total no. of people reporting pain, *n*	460	164	72	138	239	58	120	4,181	190
Percentage of reported discomforts, %	72.7	15.5	70	78	88	71.6	85	83.3	79.2

MSD, musculoskeletal disorder.
* Percentage of discomfort over the total work-related MSDs reported.

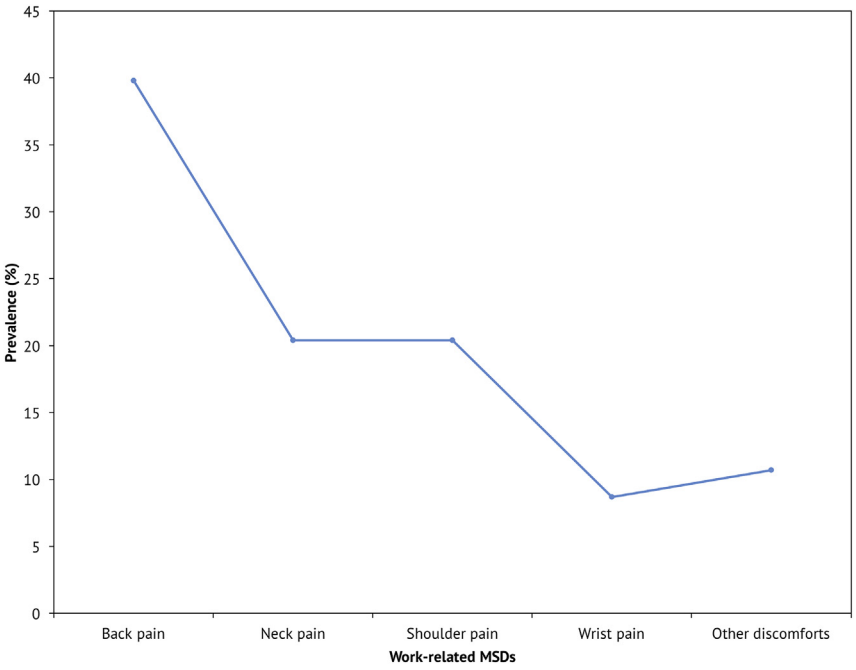

Fig. 3. Prevalence of different work-related musculoskeletal disorders (MSDs) among workers.

work all day to accomplish a specific task. This requires one to work beyond human capacity, resulting in fatigue, which may contribute to serious accidents. A comparison of psychosocial factors with the prevalence of MSDs showed that only pressure at work had a significant statistical relationship among the workers, as illustrated in Fig. 5. Compared with the Turkey AAPs report, no clear relationship between MSDs and the psychosocial factors exists [9]. However, it is worth noting that similar results existed in Iran [33]. Other psychosocial factors' relationship with MSDs such as the years at work can be found in previous reports [34,35], although this was not found in this study, where the increase in each increased prevalence of MSDs among workers. The working hours in different plants were extraordinarily long (average, 57.4 hours/wk), far more than required in the industrial countries [36]. Extended working hours have previously been documented to contribute to the development of MSDs among different work groups [33]. In addition, continuous work without breaks is known to be associated with the occurrence of the MSDs [10]. Regular rest breaks reduce

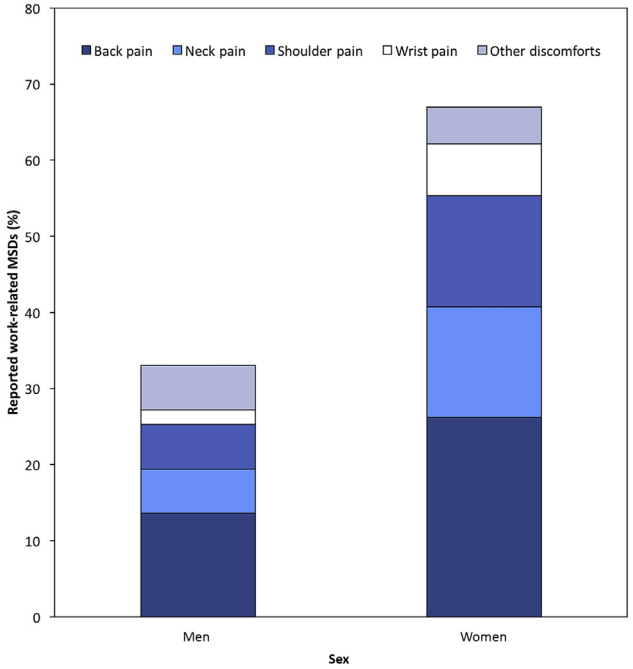

Fig. 4. Severity of discomforts for each body region argued between the sexes in the past 12 months.MSD, musculoskeletal disorder.

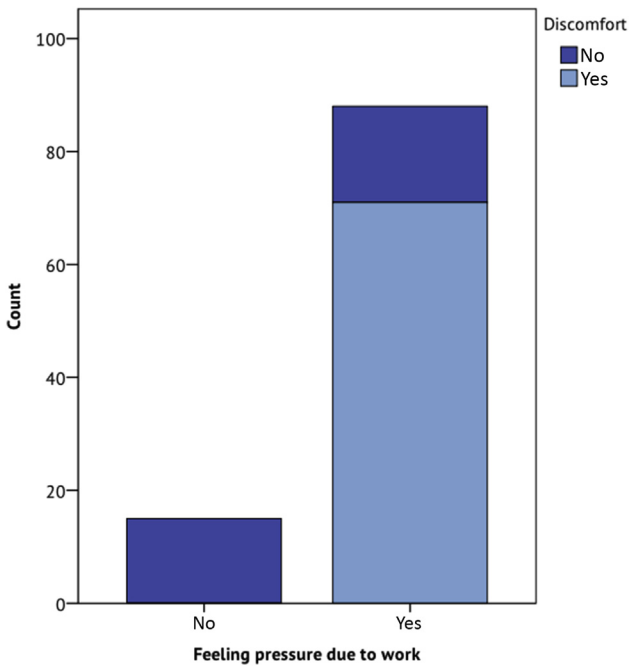

Fig. 5. Relationship between workers' feeling pressure at work and reported discomforts (at least a discomfort).

these discomforts [37]. The extended working hours and missed breaks might result in increases in workers' turnover and accidents. The extended working hours requires workers to work beyond their capacity even when they are tired. This therefore makes workers ignore any safety steps which tend to be time consuming as they are already tired and want to get the job done, which in turn can lead to unnecessary accidents. Also, too much physical work, which is typical in AAPs, makes the workers bodies weak which in future comes back as body pain which clearly reflects as MSDs. As the result of such, there is increased management spending with less output inform of medical fees to cater for injuries, losses as a result of unproductive down time when accidents happen, and costs associated with recruitment of new workers and laying off of affected workers who can no longer perform their tasks well due to numerous and increased MSDs occurences in their bodies as previously reported [6,10,33].

The findings of this study show that the workstation posture was widely ergonomically engineered. Many workers' postures enabled horizontal thighs (77.7%), vertical lower legs (100%), had footrest (95%), and allowed neutral wrists (91.3%). However, most seats could not be adjusted easily and lacked padded seat, adjustable backrest, and lumbar support. It is worth noting that among all the laws and principles from an ergonomic point of view [38], the Ugandan AAPs have addressed the workstation design very well in comparison with that in San Francisco [5] and Bangladesh [6]. However, many workers did not undergo training about occupational health and safety. More discomforts (more than one discomfort) were reported by workers who lacked safety training. Evidence to increased number of discomforts among workers in Ugandan AAPs can be attributed to safety illiteracy and low education. The explanation to this is that if by chance a worker was never trained on proper working posture, appropriate work approaches, or how to adjust workstation, and safety measures when still in school, then the chances of him/her getting trained while at work are virtually nonexistent. Low educational status has been previously shown to be significantly associated with MSDs [33]. When compared with other workers, those with a higher educational level had a lesser prevalence of MSDs.

Environmental conditions including lighting, noise, and vibrations in the plants were uncomfortable for workers on average (50.2%). This is because workers lacked personal protective equipment. Few workplaces lacked artificial lighting and many lacked ventilators. No air conditioners were installed to mitigate excessive heat conditions in these very tight and congested plants (Table 4). Similar results were also reported in Bangladesh AAPs [6]. The combination of these conditions implied a physiologically traumatic work environment. This has a negative effect on workers' productivity and health.

Observations of the physical workplace showed work practices, workplace settings, and equipment designs that were unfavorable to productivity of workers together with their safety and health. Workers in only one plant adhered to some few ergonomic principles, such as less tight time schedules and longer rest pauses. Jobs were poorly organized, with departments placed in a less logical flow order. These results are thought to be one of the reasons obstructing production and leading to high prevalence of work-related MSDs.

In conclusion, this study probed into ergonomic workplace conditions in the Ugandan AAPs. Workers' demographic details, prevalence of MSDs, job characteristics, and relationships between them were obtained by questionnaire responses and direct observation of the workers at their workplaces. These reported findings revealed that Ugandan AAPs are not safe and require numerous adjustments regarding workers' training and retraining by the management about safety and occupational health, education of the workers, and adherence to the ergonomic principles when designing the workplace. It is paramount to understand that the poor working conditions witnessed not only affect the workers' health but also results in continued reduced productivity of the AAPs, which ultimately has an impact on profits, and therefore the revenue. Thus, if the country is to improve its productivity and supply to the various existing textile and clothing trading regimes granted to her to improve her economy, the garment industry together with the government should plan to ensure good working conditions in the AAPs, to reduce the injuries imposed on their workers to maximize productivity from healthy and motivated workers.

Conflicts of interest

The authors declare no conflicts of interest.

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