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Age and Gender Differentials on Workers' Knowledge of Physical and Ergonomic Hazards in Plastic Manufacturing Industries in Anambra State

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Abstract
The study was conducted to ascertain age and gender differentials on workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries in Anambra State. Three research questions and two null hypotheses guided the study. A descriptive cross-sectional research design was adopted for the study. The population for the study consisted of all the workers in the 8 registered plastic manufacturing industries in Anambra State. The sample size was 242 workers. The instrument for data collection was a structured Age and Gender Differentials on Workers' Knowledge of Physical and Ergonomic Hazards Questionnaire (AGDWKPEHQ). A reliability index of 0.81 was obtained and the instrument was adjudged reliable for the study. Frequencies and percentages were used for answering the research questions while Chi-square statistic was used to test the null hypotheses at .05 alpha level. Results among others indicated that more than half of workers identified physical (65%) and ergonomic (66.3%) hazards in plastic manufacturing industries. More than half of workers possessed a good knowledge of physical (62.96%) and ergonomic (64.18%) hazards. Also, at the .05 level of significance, workers' knowledge of physical and ergonomic hazards was significant based on age (p< .05). Based on the findings, the study recommended among others that since workers possess good knowledge of physical and ergonomic hazards in their workplace, workers should strive to minimize their exposure to those hazards, especially physical hazards such as excessive noise, heat, radiation among others so that will be healthier and more productive.
Keywords: Physical Hazards, Ergonomic Hazards, Workers, Knowledge, Plastic Industries

Introduction

In all the nations of the world, workers in different work environments are exposed to diverse forms of physical and ergonomic hazards which have been linked to poor health outcomes among workers. Workplace Safety and Health Institute (2014) estimated that 2.3 million deaths occurred annually across the globe for reasons attributed to work. The International Labor Organization (ILO) (2016) estimates that yearly, approximately 270 million work-related accidents occur worldwide, especially work-related physical and ergonomic hazards. Hence, possession of good knowledge of physical and ergonomic hazards among workers becomes expedient. Regrettably, Shikdar and Sawaqed (2004) posited that ergonomics awareness remains low in developing countries unlike in developed countries, especially in Nigeria where knowledge of ergonomic hazard is reportedly low (Ismaila, 2010; Oladeinde, Ekejindu, Omoregie, & Aguh, 2015). Consequently, cases of loss of body parts, accidents, injuries, damages and deaths (Isara & Ofili, 2012; Ohajinwa, vanBodegom, Vijver, Olumide, Osibanjo, & Peijnenburg, 2017; Ojukwu, Anyanwu, Eze, Chukwu, Onuchukwu, & Anekwu, 2018) have been reportedly high among Nigerian workers with plastic manufacturing industries recording the highest occurrence of injuries as a result of hazards (Geetha, 2016).

Hazard has been severally defined in literature. Hazard is something that can cause harm if not controlled (Jadab, 2012). Hazards are an inherent property of a substance, agent, and source of energy or situation that has the potential of causing undesirable consequences (Aluko et al., 2017). Hazards are work materials, substances, work processes, or conditions that may result or predispose one to accidents, injuries, or diseases (Agbana, Joshua, Daikwo, & Metiboba, 2016). From the foregoing, hazards are adverse conditions or situations which can cause harm, such as illness, injury, diseases, damage or death to workers. Examples of hazards include the use of obsolete manual machines, exposure to chemicals, dust, specks of dirt, radiations, extreme temperature, noise, among other hazards. Hazards can result in hearing loss, liver damage, silicosis, asbestosis, lead poisoning, heart diseases, musculoskeletal disorders, allergies (Trimpop & Zimolong, 2011). Hazards can emanate from different sources and can be found in homes, markets, churches, workplaces among others. Hazards found in workplaces are referred to as occupational hazards.

Occupational hazards refer to work-related adverse conditions that expose workers to harm whether injuries, damages, illnesses or death. Ontario Canadian Ministry of Labour (OCML, 2013) defined occupational hazard as a factor or situation with the potential to harm a worker. However, occupational hazard is an adverse situation in the work environment, capable of causing harm, whether injuries, illnesses, diseases, deaths or damage to the health of the workers. A worker is an employee who renders services in exchange for money. Employees in the Nigerian manufacturing industry encounter operational problems of noise, toxic materials, heat and stress, radiation, trauma and other hazards (Kalejaiye, 2013), thermal radiation, hot noisy environments, presence of dust, fumes, oils, grease and other chemicals, improperly designed tools and machinery (Bande & Givercman, 2010). These forms of occupational hazards have been classified by the World Health Organization (2007) into physical, biological, chemical, adverse ergonomic conditions, mechanical, reproductive, social and psychological hazards and allergenic agents. However, this study focuses on physical and ergonomic hazards in plastic manufacturing industries because physical and ergonomic hazards are one of the major causes of plastic industry accidents (United States Occupational Safety and Health Administration, 2016; Desai & Vinekar, 2019).

Physical hazards are factors within the environment that can harm the body without necessarily touching it. Physical hazards include excess noise, excess heat and high temperature, radiation and slippery/wet/rough floors, vibration, slips, trips and falls, electromagnetic radiation, poor illumination (Law & Britton, 2011; Nnaji-Ihedinmah and Ugwu, 2016) and other hazards such as ergonomic hazards. Ergonomics is the scientific study of people concerning their work environment. It is the process of designing or arranging workplaces, products and systems so that they fit the people who use them (Dunmade, Adegoke, & Agboola, 2014). Ergonomic hazards may be the hardest to spot, since the workers may not immediately notice the strain on the body or the harm that these hazards pose.

Ergonomic hazards result from non-application of ergonomic principles like designed machinery, mechanical devices and tools used by workers, improper seating and workstation design or poorly designed work practices (Nnaji-Ihedinmah & Ugwu, 2016) which are evident in plastic manufacturing industry. Desai and Vinekar (2019) stated that plastic industry workers typically require the adopting of awkward postures such as the lifting of heavy loads, manual handling, frequent bending and twisting of the body, staying in a static posture for a long period, and other repetitive physical demands workers engage in plastic manufacturing industries.

Plastic manufacturing industries are for plastic fabrication. Plastic fabrication refers to the design, manufacture or assembly of plastic products through a manufacturing process (White Paper, 2019). Plastics are synthetic polymers that are made up of chains of repeating molecular units called monomers which are building blocks of polymer (Dematteo, 2011). Plastic manufacturing industries have a lot of physical and ergonomic hazards because plastic processing machines operate with pronounced noise, at high temperatures and require repetitive bending and use of machinery (Desai and Vinekar, 2019). In a study conducted by Agbana, Joshua, Daikwo, and Metiboba (2016), workers identified heat, noise and electric shock as the most common physical hazards in their occupation. Also, slips and falls were identified as occurring physical hazards in their occupation. Oluwafemi, Abiola, Akingbade, Faeji, and Oni's (2017) study shows that workers identified extreme heat, excessive noise among others as the most common hazards in their workplace. Onowhakpor, Abusu, Adebayo, Esene, and Okojie (2017) found out that in developing countries, work is becoming increasingly mechanized, and thus, workers use heavy tools (machines) usually in an uncomfortable position involving lengthy and frequent bending, thus, putting their health and lives at risk. Desai and Vinekar (2019) reported that a majority of the workers in the plastic industry were required to perform tasks that involved frequent bending and twisting of the trunk which have contributed to the high prevalence (73%) of work-related musculoskeletal disorders in the studied population. This high prevalence of musculoskeletal disorder shows that workers in plastic industries may lack the correct knowledge of ergonomic hazards in their work. Hence, in mitigating physical and ergonomic hazards among workers, knowledge is paramount.

The knowledge possessed regarding potential sources of hazards in ones' occupation plays a key role in hazard prevention. Knowledge according to Agu, Agbaje, and Nnamdi (2015), is familiarity, awareness or understanding of something, such as facts, information, description or skill which is acquired through experience or education. In mitigating harm, damage and illness due to physical and ergonomic hazards, knowledge of physical and ergonomic hazards among workers is essential. Regrettably, many workers have little or no knowledge of the nature of work, use of machinery and certain adverse effects of exposure to plastic production materials and work conditions. Hence, cases of occupational hazards have been reportedly highest among workers in plastic manufacturing industries in Nigeria industrial cities (Geetha, 2016), including Anambra State. One such case of ergonomic hazards is the case of a 23-year-old orphan who got his right hand severed from the wrist by a moulder machine after his boss caused the plastic making machine to operate faster than usual (Odita, 2017).

Several studies have been conducted on workers' knowledge of physical and ergonomic hazards in different industries. For example, Adebola (2014) reported high knowledge of physical hazards among nurses in Nigeria. Ismaila (2010) who studied ergonomic awareness among Nigerian workers in the manufacturing sector found that the level is very low. Oladeinde, Ekejindu, Omoregie, and Aguh (2015) found that ergonomic knowledge and awareness among laboratory workers in Nigeria are poor. However, Ugwu (2015) reported high knowledge of ergonomically poor work environments among ANAMCO workers. However, this study was interested in determining differentials on workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries in Anambra State based on age and gender

Age and gender are factors that have been implicated in the study of knowledge of hazards. Bergh (2003) observed that the occurrence of hazards is associated with such personal factors as age. According to the author, there is always a high accident rate between ages 17 and 28 and in people aged 60 years and above. This suggests that hazards likely occurs more among young and aged workers than in middle-aged workers. International Labour Organization (ILO) (2013) stated that recognizing diversity, including gender differences, in the workforce is vital in ensuring the safety and health of both men and women workers. ILO further stated that a gender-sensitive approach recognizes that because of the different jobs women and men do, their different societal roles, the expectations and responsibilities they have, women and men may be exposed to different physical and ergonomic hazards. Ajah (2012) opined that females usually display less extensive environmental knowledge than males, but they are more emotionally engaged, show more concern about environmental destruction, believe less in technological solutions and are more willing to change. Ahmad et al (2012) opined that age directly or indirectly influences human knowledge towards hazards. Aliyu and Auwal (2015) found a marginally significant difference between age and knowledge of physical hazards among workers. Also, Ambaye (2016) found a significant association between age and physical hazards. Similarly, Geetha (2016) found that age was significant in the knowledge of hazards. Ugwu's (2015) finding shows a significant difference in knowledge of occupational hazards among male and female workers. However, Baksh, Ganpat and Narine (2015) and Ambaye (2016) reported no significant difference in the knowledge of hazards based on gender. Thus, the study sought to determine age and gender differentials on workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries in Anambra State.

Anambra State was created out of old Anambra in 1991. The State is one of the most densely populated commercial States located in South-East, Nigeria and appears to be among the commercial and rapidly industrializing States in Nigeria (Anambra State Ministry of Information, Culture and Tourism., 2012). Thus, there are many registered and unregistered plastic manufacturing industries in Anambra State. Consequently, cases of loss of body parts, fire outbreaks, and accidents, resulting to disabilities, injuries, damages, burns, scalds and even deaths are observed among workers including plastic manufacturing industries in Nigeria, where Anambra State is located. Oyesola (2010) reported that Nigerian workers across all sectors of the economy have become more endangered and prone to an accident which ranges from minor to fatal, as some have lost their lives right in the line of duty, while some have lost vital organs, and rendered permanently incapacitated. Therefore, the purpose of the study was to determine age and gender differentials in workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries in Anambra State. Specifically, the study determined: workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries and workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries based on age and gender.

Research Questions

Three research questions guided the study

1. What is the workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries?
2. What is the workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries based on age?
3. What is the workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries based on gender?

Hypotheses

The following null hypotheses were postulated for the study

1. There is no significant difference in the workers' knowledge of physical and ergonomic hazards based on age.
2. There is no significant difference in the workers' knowledge of physical and ergonomic hazards based on gender.

Materials and Methods

Subjects and study design: The descriptive cross-sectional survey research design was adopted in determining age and gender differentials on workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries in Anambra State.
Study population and sample size determination: The population for the study consisted of 242 workers in 8 registered plastic manufacturing industries in Anambra State. Therefore, no sampling was done because the population was manageable.

Data collection tools and procedure: The instrument for data collection was a structured Age and Gender Differentials on Workers' Knowledge of Physical and Ergonomic Hazards Questionnaire (AGDWKPEHQ). The instrument was in two sections- A and B and contained 11-items. Section A consisted of two items on personal information of the respondents while section B consisted of 9 items on knowledge of physical and ergonomic hazards. The instrument was face validated by five experts from the Department of Human Kinetics and Health Education, University of Nigeria, Nsukka. The reliability of the instrument was established using the split-half method. Spearman-Brown correlation formula was used to compute the reliability index of the instrument. A reliability coefficient of 0.81 was obtained for the instrument which was adjudged reliable for use in the study. The researchers went to all the 8 registered plastic industry and administered 242 questionnaires to workers by hand and collected them back after completion on the spot. Four days were given to workers who were unable to complete the questionnaire and one of the researchers went back to the industry to collect back the completed questionnaire.

Data analysis: Responses on the questionnaire were checked to ensure that they were properly filled out. Six copies of the instrument were not properly filled out and were discarded. The properly filled out copies of the questionnaire were 236 in number and were used for analysis. Statistical Package for Social Sciences version 23 was used for data analysis. Percentages were used to answer all the research questions. < 40 per cent represent a proportion, 41-49 per cent represent nearly half, 50 per cent represents half, 51-69 per cent represent more than half, 70 per cent represent two-third, 71-79 per cent represents more than two-third while 80-100 per cent represents a majority. Chi-square statistic was used to test the null hypotheses at a .05 level of significance.

Results

Table 1
Frequency and Percentage Responses on Occupational Hazards in Plastic Manufacturing Industries (n=236)

S/N	Items on occupational hazards	Responses	
		Yes f (%)	**No** f (%)
	Physical hazards		
1.	Excess noise	190 (80.5)	46 (19.5)
2.	Excess heat	175 (74.2)	61 (25.8)
3.	High temperatures (Too hot or Too cold)	163 (69.1)	73 (30.9)
4.	Poor lighting	144 (61.0)	92 (39.0)
5.	Poor ventilation	144 (61.0)	92 (39.0)
6.	Slippery/wet/rough floors	135 (57.2)	101 (42.8)
7.	Heights (staircases)	143 (60.6)	93 (39.4)
8.	Smoke	147 (62.3)	89 (37.7)
9.	Radiation	139 (58.9)	97 (41.1)
	Cluster %	**65.0**	**35.0**
	Ergonomic hazards		
10.	Frequent bending	160 (67.8)	76 (32.2)
11.	Uncomfortable working position	175 (74.2)	61 (25.8)
12.	Frequent climbing	134 (56.8)	102 (43.2)
	Cluster %	**66.3**	**33.7**

Key: < 40% = few proportion 41-49 % = nearly half, 50% = half, 51-69% = more than half, 70 % = two-third 71-79% = more than two-third 80-100 % majority.

Table 1 shows that overall, more than half of workers in plastic manufacturing industries possessed good knowledge of physical (62.96 %) and ergonomic (64.18%) hazards in their workplaces, while a small proportion possessed poor knowledge of physical (37.04%) and ergonomic (35.82%) hazards.

Table 2
Frequency and Percentage Responses on Workers' Knowledge of Physical and Ergonomic Hazards in Plastic Manufacturing Industries Based on Age (n=236).

		Age							
		18-27 (n=170)		28-37 (n=48)		38-47 (n=13)		48+ (n=5)	
S/no	Knowledge items	n	%	n	%	n	%	n	%
	Physical hazards								
1.	Exposure to constant loud noise can lead to ear problems overtime	153	90.0	42	87.5	12	92.3	5	100
2.	Poor lighting in workplace cannot cause eye problems	72	42.4	18	37.5	5	38.5	2	40.0
3.	Extreme low temperatures can predispose to respirat/ory infections	115	67.6	33	68.8	9	69.2	3	60.0
4.	The quality of air in workplace does not affect workers' health	66	38.8	23	47.9	6	46.2	2	40.0
5.	Excessive heat at workplace can lead to discomfort	132	77.6	33	68.8	9	69.2	3	60.0
	Cluster %		**63.3**		**62.1**		**63.1**		**60.0**
	Ergonomic hazards								
6.	Frequent bending while operating a machine may lead to strain	141	82.9	36	75.0	7	53.8	3	60.0
7.	Uncomfortable working position cannot cause strain overtime	89	52.4	21	43.8	5	38.5	1	20.0
8.	Improperly positioned machine may lead to sore muscles	133	78.2	35	72.9	11	84.6	4	80.0
9.	Working with unfamiliar facility is not dangerous	91	53.5	22	45.8	4	30.8	3	60.0
	Cluster %		**66.8**		**59.4**		**51.9**		**55.0**

Key: < 40% = few proportion 41-49 % = nearly half, 50% = half, 51-69% = more than half, 70 % = two-third 71-79% = more than two-third 80-100 % majority.

Table 2 shows that more than half of workers in plastic manufacturing industries irrespective of their age category possessed a good knowledge of physical and ergonomic hazards in their workplaces. The table also shows that workers aged 18-27 years possessed a good knowledge of physical and ergonomic hazards more than those in other age categories in the workplace.

Table 3
Frequency and Percentage Responses on Workers' Knowledge of Physical and Ergonomic Hazards Based on Gender (n=236)

		Gender			
S/no	Knowledge items	Male (n=128)		Female (n=108)	
		f	%	f	%
	Knowledge of physical hazards				
1.	Exposure to constant loud noise can lead to ear problems overtime	117	(91.4)	95	(88.0)
2.	Poor lighting in the workplace cannot cause eye problems	54	(42.2)	43	(39.8)
3.	Extreme low temperatures can predispose to respiratory infections	95	(74.2)	65	(60.2)
4.	The quality of air in the workplace does not affect workers' health	58	(45.3)	39	(36.1)
5.	Excessive heat at workplace can lead to discomfort	98	(76.6)	79	(73.1)
	Cluster %		**65.9**		**59.4**
	Knowledge of ergonomic hazards				
6.	Frequent bending while operating a machine may lead to strain	104	(81.2)	83	(76.9)
7.	Uncomfortable working position cannot cause strain overtime	66	(51.6)	50	(46.3)

8.	An improperly positioned machine may lead to sore muscles	98	(76.6)	85	(78.7)
9.	Working with unfamiliar facility is not dangerous	64	(50.0)	56	(51.9)
	Cluster %		**64.9**		**63.5**
	Overall %		**65.4**		**61.5**

Key: < 40% = few proportion 41-49 % = nearly half, 50% = half, 51-69% = more than half, 70 % = two-third 71-79% = more than two-third 80-100 % majority.

Table 3 shows that overall, more than half of both male and female workers in plastic manufacturing industries possessed a good knowledge of physical and ergonomic hazards. The table also shows that male workers more than female workers in plastic manufacturing industries possessed a good knowledge of physical and ergonomic hazards in their workplaces.

Table 4
Summary of Chi-square Test of Workers' Knowledge of Physical and Ergonomic Hazards Based on Age (n=236)

		PH		EH					
		Yes	No	Yes	No				
Age	**N**	**O(E)**	**O(E)**	**O(E)**	**O(E)**	**χ^2**	**df**	**P-value**	**Sig**
18-27years	170	124(121)	46(49)	149(143.3)	21(26.7)				
28-37years	48	34(34.2)	14(13.8)	37(40.5)	11(7.5)	4.630	3	.035	*
38-47years	13	7(9.3)	6(3.7)	9(11.0)	4(2.0)				
48years+	5	3(3.6)	2(1.4)	4(4.4)	1(1.8)				

Key: PH = Physical Hazard EH= Ergonomic Hazard * = Significant

Table 4 shows that the null hypothesis of no significant difference in the workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries based on age was rejected ($\chi^2 = 4.630$, df = 3, $p = .035 < .05$). This implies that irrespective of age, there was a significant difference in the knowledge of physical and ergonomic hazards among workers of plastic manufacturing industries.

Table 5
Summary of the Chi-square Test on Workers' Knowledge of Physical and Ergonomic Hazards in Plastic Manufacturing Industries based on Gender (n=236)

			PH		EH					
s/n	**Items**		**Yes**	**No**	**Yes**	**No**				
	Gender	**N**	**O(E)**	**O(E)**	**O(E)**	**O(E)**	**χ^2**	**df**	**P-value**	**Sig**
1	Male	128	96(91.1)	32(36.9)	72(76.9)	36(31.1)	1.983			
2	Female	108	106(107.9)	22(20.1)	93(91.1)	15(16.9)	.482	1	1.013	*

Key: PH = Physical Hazard , EH= Ergonomic Hazard EH= Ergonomic Hazard * = Significant

Table 5 shows that the null hypothesis of no significant difference in the workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries based on gender was accepted ($\chi^2 = 1.013$, df = 1, $p = .474 < .05$). This implies that there was no significant difference in the knowledge of physical and ergonomic hazards among male and female workers of plastic manufacturing industries.

Discussion of Findings

Table 1 shows that overall, more than half of workers in plastic manufacturing industries possessed a good knowledge of physical and ergonomic hazards in their workplaces, while few proportion possessed poor knowledge of physical and ergonomic hazards. This finding is expected because according to the findings of similar studies conducted by Adebola (2014); Awodele, Popoola, Ogbudu, Akinyede, Coker, and Akintonwa (2014); Aluko, Adebayo, Adebisi, Ewegbemi, Abioye, and Popoola (2016) and Oluwafemi, Abiola, Akingbade, Faeji, and Oni (2017), workers were knowledgeable about hazards in their occupation. However, the findings of this study contradict that of Geetha (2016) in which half of the workers in the plastic packaging industry had inadequate knowledge regarding hazards in their workplaces. The study's findings also disagreed with that of

Agbana, Joshua, Daikwo, and Metiboba (2016) in which workers' knowledge of hazards was low but agreed with the findings of Ugwu (2015) in which workers possessed very high knowledge of ergonomic hazards.

Table 2 shows that more than half of workers in plastic manufacturing industries irrespective of their age category possessed a good knowledge of physical and ergonomic hazards in their workplaces with workers aged 18-27 years possessing good knowledge of physical and ergonomic hazards more than those in other age categories in the workplace. Additionally, table 4 shows a significant difference in the workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries based on age. This finding was satisfactory because one expects disparity in the knowledge individuals possess regarding a particular subject based on their age. Also, Ahmad et al (2012) opined that age directly or indirectly influences human knowledge towards hazards. The finding of this study agrees with the findings of Aliyu and Auwal (2015) who found a marginal significant difference between age and knowledge of physical hazards among workers; Ugwu (2015) reported a significant difference in knowledge of ergonomic hazards based on age. Also, the study finding agrees with the findings of Ambaye (2016) who found a significant association between age and physical hazards; and Geetha (2016) found that age was significant in the knowledge of hazards.

Table 3 shows that overall, more than half of both male and female workers in plastic manufacturing industries possessed a good knowledge of physical and ergonomic hazards. The table also shows that male workers more than female workers in plastic manufacturing industries possessed a good knowledge of physical and ergonomic hazards in their workplaces.

Table 4 shows that the null hypothesis of no significant difference in the workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries based on age was rejected. This implies that irrespective of age, there was a significant difference in the knowledge of physical and ergonomic hazards among workers of plastic manufacturing industries.

Table 5 shows no significant difference in the workers' knowledge of physical and ergonomic hazards in plastic manufacturing industries based on gender. This implies that knowledge of physical and ergonomic hazards among workers of plastic manufacturing industries was the same for both male and female workers. This finding is surprising because gender plays a role in environmental consciousness and knowledge. This finding contradicts the findings of Ugwu (2015) who reported a significant difference in the knowledge of physical and ergonomic hazards among male and female workers but agrees with the findings of Aliyu and Auwal (2015) and Ambaye (2016) who reported a significant difference in workers' knowledge of hazards based on gender.

Implications of the Study's Findings

The study revealed that more than half of workers in plastic manufacturing industries possessed a good knowledge of physical and ergonomic hazards in their workplaces, while a few proportion possessed poor knowledge of physical and ergonomic hazards. Furthermore, the study shows that irrespective of workers' age category, they possessed a good knowledge of physical and ergonomic hazards in their workplaces with workers aged 18-27 years possessing good knowledge of physical and ergonomic hazards more than those in other age categories in the workplace. Also, male workers more than female workers in plastic manufacturing industries possessed a good knowledge of physical and ergonomic hazards in their workplaces. These findings have serious implications for the health of the workers and that of their families, economic growth and national development. This is because the few proportions of workers that possess poor knowledge of physical and ergonomic hazards may be exposing themselves to physical and ergonomic hazards, especially women who are 28 years and above that are supposedly married with a family. A woman's health is a strong determinant of family health. When the woman is sick, nothing seems to work in the family, malnutrition may set in and the children will become uncared for because women are home builders.

Conclusion

The findings have shown that more than half of workers in plastic manufacturing industries possessed a good knowledge of physical and ergonomic hazards in their workplaces. Also, the study shows a significant difference in the workers' knowledge of physical and ergonomic hazards based on age and no significant difference in workers' knowledge of physical and ergonomic hazards based on gender. The study, therefore, concludes that a good number of workers in plastic manufacturing industries possessed a good knowledge of physical and ergonomic hazards and that age was significant in knowledge of physical and ergonomic hazards.

Recommendations

Based on the findings of this study, the following recommendations were proffered:

1. Since workers possess good knowledge of physical and ergonomic hazards in their workplace, workers should strive to minimize their exposure to hazard, especially physical hazards such as excessive noise, heat, radiation among others to they will be healthier and more productive.
2. Workers' workstations should be improved and the use of obsolete machines and frequent and awkward movements minimized to reduce ergonomic hazards.
3. Employees should consider the age of workers while employing them since age was significant in worker's knowledge of physical and ergonomic hazards.

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