Original Article

Socio-demographic Characteristics and Workplace Safety Practices of Panel Beaters: A Comparative Study of Roadside and Organized Sectors in Enugu State, Nigeria

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Abstract

Background: Human resources and their safety are central to occupational health practices. Understanding the sociodemographic characteristics and safety practices of workers helps in workplace interventions. This study aimed at comparing the sociodemographic characteristics and safety practices among roadside and organized panel beaters in Enugu metropolis, Enugu State, Nigeria. **Methodology:** This was a comparative cross-sectional study. A multistage sampling method was used to select 428 panel beaters in Enugu metropolis. A semi-structured interviewer-administered questionnaire was used for data collection. Data was entered and analyzed using the Statistical Package for the Social Sciences 20. Comparative analysis was done using Chi-square and the level of significance was set at 5%. **Results:** The mean ages (standard deviation) were 31.1 ± 10.3 years and 37.9 ± 12.1 years for roadside and organized panel beaters, respectively. The majority of respondents, (70.6%) and (56.5%), from the roadside and organized sectors, respectively, had secondary education. About 59.8% of the roadside panel beaters were single compared to about two-thirds (63.1%) of organized panel beaters who were married. More than two-thirds (72.9%) of roadside workers earn more than N 35,000 monthly, while half of the organized workers earn more than N 35,000. The differences in sociodemographic characteristics and monthly income were statistically significant. Environmental sanitation was the most common safety and hygiene practices engaged by respondents. Very few respondents, more among the organized sector, noted that their workplaces were monitored or checked. The use of personal protective equipment was found to be generally deficient, in addition to poor health and safety training. **Conclusion:** There was a statistically significant difference in the sociodemographic characteristics between the roadside and organized sectors panel beaters with poor safety practices. Routine and improved health education and safety training on basic preventive measures would be necessary to prevent occupational hazards in the workplace.

Keywords: Panel beaters, sociodemographic characteristics, workplace safety measures

Introduction

Panel beaters are a sub-specialty of automobile technicians whose occupational practices include panel beating, car repairs, cuttings, soldering, welding, wheel refinishing, and spray paintings.[1] Panel beaters can exist as the roadside informal sector or as the formal organized sector. The organized sector is governed by acts such as the factories act, labour laws, and workmen's compensation act with some defined managerial presence. The informal sector is mainly an unincorporated enterprise limited in personnel, financial, and organizational setup for effective management.[2] It is noted that reorganization of the structure of informal sectors makes it more productive and safe, however, lack of access to capital resources retards this development.[3] Nigeria is a developing country that is densely populated with improvements in roads, highways, and transport systems with the proliferation of the transport business. The high cost of motor spare parts in Enugu State, Eastern Nigeria, has increased the need for repairs and the

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consequent higher number of panel beaters in both sectors. The repair workshops could be grouped as small, medium, and large workshops based on the number and density of personnel and volume of repair activities.[4]

Panel beating as an occupation contribute to achieving social and economic goals of labour absorption, income distribution, poverty alleviation, rural development, and economic growth.[4] Most countries encourage this economic contribution through vocational and technical education and apprenticeship.[5] The informal sector of workers contributed up to 0.93% and 0.94% of Nigerian Gross Domestic Product in 2009 and 2010, respectively, serving as a potential source of employment for the unemployed youth with an unrestricted entry point and accommodated mostly the poorly educated and dropout populace. It is a veritable tool for achieving the Sustainable Development Goals for the employment of youths.[6] Despite the above economic benefits, panel beaters are a high-risk group of workers who are constantly exposed to the occupational hazards of their workplace, i.e., physical, psychological, and ergonomic hazards with systemic health effects.[7,8] These effects are mitigated by the development of safety habits or use of personal protective equipment (PPE), environmental protection, staff training, and retraining.[9]

The International Labor Organization estimated that 2.34 million work-related deaths occur every year, 321,000 are due to accidents, while 2.02 million deaths were reported to be caused by various types of work-related diseases.[10] A study in Helsinki, Finland, found socioeconomic inequalities to be associated with occupational hazard outcomes.[10] Education, occupational class, and individual income are protective variables. Those without higher education were found to be more than twice likely to encounter hazards compared to those with high education. Manual workers were more than four times likely to encounter occupational hazards compared to managers and professionals. Those in the lowest income quartiles were more than three times likely to encounter occupational hazards compared to the highest quartile.[11] Also among occupational workers, the use of safety measures continues to be a problem. A study in Uyo, Nigeria, found that 7.0% of workers used PPE and only 4.2% had any form of medical examinations.[7]

This study will help in understanding the sociodemographic characteristics of panel beaters and their safety practices and also help to focus intervention to the vulnerable workforce, and to provide evidence for continuous advocacy to employers and employees on routine safety measures necessary to improve safety practices and reduce workplace hazards. This study therefore aimed at comparing the sociodemographic characteristics and safety practices between roadside and organized panel beaters in Enugu metropolis.

Methodology

The study area was Enugu metropolis which is the capital of Enugu State in the southeast geopolitical zone of Nigeria. The study was a comparative cross-sectional study of roadside and organized panel beaters in Enugu metropolis. Panel beaters and trainees who had spent over one year and were willing to participate in the study were selected for the study. The minimum sample size for the study was determined using the formula for comparing two independent proportions.[12] A minimum sample size of 214 per sector was obtained after correcting for nonresponse rate giving a total of 428 panel beaters.

A multistage sampling technique was used for both roadside and organized panel beaters in this study. For the roadside panel beaters, the first stage was the selection of Enugu North among the three local government areas (LGAs) by simple random sampling as a zone using the balloting method. The second stage was the selection of one division out of the five divisions in Enugu North LGA by simple random sampling using the balloting method. The third was the selection of 10 branches out of the 13 branches in Enugu North LGA by simple random sampling using the balloting method. Finally, stratification and proportionate allocation of panel beaters from all the workshops within the selected branches was done. Based on the density of workers and workshops concentration, there were 29 small (<5 panel beaters), 16 medium (5–10 panel beaters), and 9 large (>10 panel beaters) workshops, respectively, from the 54 workshops. Using proportionate allocation, a total of 228 panel beaters were selected. For the organized panel beaters, the first step was the same as that for the roadside. The second was proportion allocation of government- and private-owned company workers, using a ratio of 1:3, 56 panel beaters from the government-owned workshop were selected out of 70 panel beaters by simple random sampling using the balloting method. The privately-owned workshops were categorized into 10 small (2–4 panel beaters), 16 medium (5–7 panel beaters), and 9 large (8–12 panel beaters) workshops. One hundred and seventy-panel beaters were selected from the private workshop giving a total of 226 panel beaters.

A structured pretested, interviewer-administered questionnaire was used to assess the socioeconomic and work habit of panel beaters. The questionnaire was adapted from those earlier used in published articles.[7,13] Data were collected using research assistants who were trained for two days, 2 h per day on questionnaire administration, also included were good communication and follow-up skills, objectives of the study, and ethical issues that were involved in the research. Data were entered and analyzed using the Statistical Package for the Social Sciences version 20. Categorical variables were summarized using frequency tables and proportions. Comparison of variables was managed using the Chi-square test. The level of significance was set at 0.05.

Ethical considerations

Ethical approval was obtained from the Health Research Ethics Committee of the University of Nigeria Teaching Hospital, Ituku/Ozalla. Permission was obtained from unions of panel beaters and organized panel beaters in Enugu State. Informed consent was obtained from participants.

Results

The mean ages (standard deviation) of the respondents were 31.1 ± 10.3 years and 37.9 ± 12.1 years for roadside and organized panel beaters, respectively. Their ages ranged from 16 to 67 years for roadside panel beaters and 18–75 years for organized panel beaters. Most respondents were < 30 years age bracket for the roadside and within 31–50 years age bracket for the organized sector. All the respondents in both sectors were male of Igbo ethnic group and a majority were of the Christian religion. Majority of the respondents, 70.6% and 56.5%, from the roadside and organized sector, respectively, had secondary education. About 38.9% of the roadside panel beaters were married compared to about two-third, 61.1%, of organized panel beaters who were married. More than two-third, 72.9%, of roadside workers earn more than N 35,000 monthly, while half of the organized workers earn more than N 35,000. The difference in monthly income was statistically significant [Table 1].

Environmental sanitation was the most common safety and hygiene practice engaged by respondents while having a separate dining room was the least. Very few respondents, more among the organized sector, noted that their workplace was being monitored or checked. The difference between the two groups was statistically significant. The most common variables checked were hygiene and workplace safety, while PPE and welfare were rarely checked. The use of PPE was found to be generally deficient, coupled with the practice of medical examination and health and safety training [Table 2].

Discussion

Four hundred and twenty-eight respondents with mean ages 31.10 ± 10.31 years and 37.88 ± 12.06 years for roadside and organized panel beaters, respectively, participated in this study. There was a wide age range among both the groups of panel beaters. This agreed with studies done in Lagos, Ibadan, and Nnewi, Nigeria.[14-16] This is due to the need for strength and experience noted among the younger and older population, respectively, in the various work practices engaged in panel beating. The roadside in this study had a younger population compared with the organized sector. This was different from a study in Lagos, Nigeria, with a comparable age group of 31–50 years reported on both sectors.[14] This difference was due to the use of apprenticeship involving young people more in the southeastern part of the country in roadside informal jobs. Panel beating was found to be a male-dominated profession which agreed with the study done in Nnewi.[16] The lower educational level compared to higher education level for the organized sector is expected for the informal roadside sector where master craftsmen mostly pass on their skills and knowledge to apprentices and rarely create new knowledge making the informal sector void of theoretical knowledge and scheme for training apprentice.[6] A study in southwest Nigeria revealed poor linkages of informal automobile repairers with higher educational institutions such as technical schools, universities, and research institutions to improve knowledge of their work processes or work practices.[17] This resonates with studies in Lagos and Kaduna.[14,18] This is due to increasing preference for postprimary education among unskilled labor and readiness for the uptake of knowledge and training as regards hazards and safety of the workplace. The difference in marital status was also noted in this study and was due to the different age distribution which differed from the study in Lagos, Nigeria, where workers in both sectors were found to be married.[14] Majority of roadside workers earned more money compared with organized workers. The roadside had better bargaining power individually with their customers, while there could be weak and non existence labour unions that protect the welfare of workers in organized private companies.

Table 1: Sociodemographic characteristics of roadside and organized panel beaters (*n*=214)

Variable	Frequency, *n* (%)		Statistical analysis	
	Roadside panel beaters	Organized panel beaters	χ^2	*P*
Age				
<30	121 (62.4)	73 (37.6)	28.027	<0.001*
31-50	81 (44.0)	103 (56.0)		
>50	12 (24.0)	38 (76.0)		
Mean±SD	31.1±10.3	37.9±12.1	*t*-test=−6.26	<0.001*
Educational level				
Below secondary	55 (45.5)	66 (54.5)	Chi Sq=14.623	0.001*
Secondary	151 (55.5)	121 (44.5)		
Tertiary	8 (22.9)	27 (77.1)		
Marital status				
Single	128 (61.8)	79 (38.2)	22.463	<0.001*
Married	86 (38.9)	135 (61.1)		
Monthly income				
<35000	58 (35.2)	107 (64.8)	23.681	<0.001*
>35000	156 (59.3)	107 (40.7)		

*Significant. SD: Standard deviation

Table 2: Work habits among roadside and organized panel beaters

Variables	Frequency, *n* (%)		Statistical analysis	
	Roadside panel beaters	Organized panel beaters	χ^2	*P*
Safety and hygiene practices				
Environmental sanitation	204 (95.3)	207 (96.7)	0.551	0.458*
Separate dinning	24 (11.2)	69 (32.2)	27.819	<0.0001*
Hand hygiene	46 (21.5)	109 (50.9)	-	-
Shower after work	38 (17.8)	185 (86.4)	-	-
Laundering of clothes	41 (19.2)	145 (67.8)	-	-
Monitor workplace	10 (4.7)	35 (16.4)	15.521	<0.0001*
Check PPE	3 (30.0)	3 (8.6)	-	-
Check hygiene	3 (30.0)	33 (94.3)	-	-
Check work-place safety	4 (40.0)	35 (100)	-	-
Check welfare	1 (10.0)	3 (8.6)	-	-
Use of PPE				
Overall				
Always	17 (7.9)	23 (10.7)	13.768	0.001*
Sometimes	81 (37.9)	46 (21.5)		
Never	116 (54.2)	145 (67.8)		
Facemasks				
Always	3 (1.4)	2 (0.9)	4.407	0.111
Sometimes	12 (5.6)	4 (1.9)		
Never	199 (93.0)	208 (97.2)		
Respirator				
Always	1 (0.5)	0	1.614	0.449
Sometimes	4 (1.9)	2 (0.9)		
Never	209 (97.7)	212 (99.1)		
Goggle				
Always	4 (1.9)	0	9.432	0.006*
Sometimes	8 (3.7)	1 (0.5)		
Never	202 (94.4)	213 (99.5)		
Boot				
Always	12 (5.6)	26 (12.1)	12.014	0.002*
Sometimes	61 (28.5)	36 (16.5)		
Never	141 (65.9)	152 (71.0)		
Medical examination				
None	187 (87.4)	208 (97.2)	18.760*	<0.0001*
Preemployment	6 (2.8)	4 (1.9)		
Periodic employment	21 (9.8)	2 (0.9)		
Health education and safetytraining	7 (3.3)	4 (1.9)	-	0.543**

*Significant, **Not significant. PPE: Personal protective equipment

The most common safety and hygiene practice found in this study from both sectors was environmental sanitation, while the least was the separate dining area, more on the roadside compared to organized panel beaters. The significant difference showed that the organized sector had the potentials for safety and hygiene practices. However, the low practice of safety and hygiene in both the sectors agreed with a study done among least developed countries where a deteriorating situation of health and safety practices was found.[19] This generally could be due to the inability to research evidence-based changing solutions specific to the informal sector with inadequate resource facilities and financial constraints. Specific to the formal sector was the poor implementation of labour legislation, the restrictiveness of the environment, and the lack of occupational health physicians to implement control measures.[19] These practices help to reduce the possible routes of exposure to occupational hazards. Monitoring of the workplace for safety was found to be very low with a significant difference between the two sectors. Among the organized sector, hygiene and safety practices were checked and monitored compared to the use of PPE and welfare while in the informal roadside sector, all were rarely checked. This agreed with a study in California, the U. S. A, showing poor monitoring for the facility for safety and health practices.[20] This could be due to inadequate utilization of occupational health practices and poor adherence to existing factory laws, labour laws, and workmen's compensation laws. The PPE in this study was abysmal in both sectors. Almost all

respondents never used respirators, facemasks, and goggles and the differences were not statistically significant. Less than three-quarter never wore overalls and boots in both sectors which were worse among organized sectors and the difference was statistically significant. The low usage of PPE exposes workers to potentials of occupational hazards. This agreed with studies done in Kenya, Thailand, and Norway where it was found that the use of PPE reduces occupational exposure to hazards.[21-23] This similarity in findings could be due to a lack of training and education on technique, the procedure of usage, and benefits of PPE which is normally done by occupational health physicians or safety engineers. Another indicator of the weak or absence of occupational health practices is the lack of medical examinations in workplaces, health education, and safety training. More than three-quarter had never had any medical examination, while <5% of respondents had had health education and safety training. This agreed with a study in Calabar, Nigeria, where among small-scale industries, there was no medical examination, no clinics, medical center, nor first aid box.[24] A study in Thailand found safety training to reduce occupational exposure to hazards.[12] This is due to poor implementation of occupational health laws, the practice of occupational health, and unavailability of occupational health physicians in industries in developing countries.

Conclusion

The roadside panel beaters constitute mainly the younger age group, single with secondary education compared to the organized panel beaters who are of older age group, and married with tertiary education. There were poor workplace safety practices more in the roadside compared to the organized sector. The use of PPE was also poor, more among organized compared to the roadside panel beaters.

Recommendation

There is a need to engage both sectors of panel beaters on routine and improved health education and safety training on the basic preventive measures necessary to prevent occupational hazards in the workplace.

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Conflicts of interest

There are no conflicts of interest.

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