

Knowledge and Attitudes on Practices of Occupational Safety and Health in the Informal Non-food Manufacturing Sector in Kampala City, Uganda.

Abstract: *The informal non-food manufacturing sector is an engine of growth and development in both developed and developing countries. The sector is unregulated and unregistered in official government statistics. However this particular sector is faced with occupational safety and health hazards without preventive measures. The study assessed knowledge and attitudes on practices of occupational safety and health in the informal non-food manufacturing sector in Kampala City, Uganda. It adopted across sectional survey design that involved both qualitative and quantitative data collection techniques. A total of 424 firms were sampled from the 6 clusters of the informal sector. Respondents were moderately knowledgeable on hazards with 39.7% compared to 25.5% who reported high level of exposure. Overall the knowledge on occupational safety and health hazards was inadequate while attitude especially on the use of PPE was poor. There was a high level on knowledge towards hazard control measures by complying with the safety measures, although no significant difference was observed in their adherence to control measures. Creation of awareness, training, and application of OSH regulations, inspection and enforcement by the relevant regulatory agency as well as proactive multi-media strategies to improve the situation is required.*

Key words: *Knowledge, attitudes, practices, Occupational Safety, Health, Informal Sector*

1. Introduction

The informal sector is described by the International Labour Organization (ILO) as part of the national economy comprising of a wide range of small scale economic units producing and distributing goods and services. Generally, they are not registered or regulated and do not benefit from government support and subsidies [1]. It encompasses a range of economic units in urban areas that are mainly owned and operated by individuals, either alone or in partnership with family members of the same household, and spans a range of sectors that include; handicrafts, leather crafts, woodworks and carpentry, metal fabrication, electrical and electronics, ceramics and pottery, textiles and garments, hair dressing, printing and graphics, chemicals and pharmaceuticals, building materials and construction, food and beverages, and agro-processing amongst others [2].

2. Literature Review

Studies conducted during the 1990s suggested that the practice of occupational safety and health in small firms and the informal sector was non-existent largely due to illiteracy and lack of knowledge of occupational safety and health [3, 4]. Recent and more systematic knowledge, attitudes and practices (KAP) studies reviewed show a consistent divergence between employers' and workers' knowledge of occupational safety and health hazards in small scale

enterprises and informal sector [5]. In a similar study in Dar es Salaam, on awareness of ergonomic principles in small industries, very low level of awareness of major areas of ergonomic hazards was found, even though the owners had received vocational training [6]. While in Manduria, India, a study investigating the ergonomic conditions found out that work environment was not generally unhealthy and unsafe but poorly designed sewing stations were used and firms could not afford height adjustable sewing tables and chairs. The study also found out that in cases where these were available workers and even the owners were either not aware that machine tables were height adjustable or did not know how to use them. The consequences were that workers suffered from injuries, neural problems, dermatological, respiratory and musculoskeletal disorders such as low back pain and neck pain [7]. In another study it was found out that workers engaged in garment manufacturing sectors had high knowledge of safety and health problems related to their occupation, good knowledge of the importance of using Personal Protective Equipment (PPE) and their benefits but a few workers demonstrated compliance to such measures [8].

Similarly another study, found out that although managers felt they knew more about hazards and risks in the work place, safety audits revealed extremely hazardous workplaces. It was noted that occupational safety and health practice is not a priority for these firms and knowledge may not

always translate into effective practice of occupational safety and health, other factors such as infrequency of accidents, and lack of economic incentives to invest in safety and health may explain [9]. A study in a small scale industry in Sheffield, UK also found out that workers were provided with PPEs but these were not used, thus raising the problem of education in the work place. This suggests that safety practice does not depend on knowledge and attitudes alone but is positively associated with being informed about safety precautions and being supplied with safety gear coupled with adequate and proper supervision [10] (Bradshaw *et al.*, 2001). Studies in the informal sector on knowledge attitudes and practices have not been done, particularly in developing countries' informal non-food manufacturing sector to compare the circumstances. In Uganda no documented studies have been able to address the informal sector as it has just emerged due to political stability.

3. Materials and Methods

3.1 Study design and setting.

The study employed a cross sectional survey design. It was carried out in Kampala City that lies on Latitudes 00° 18' 49" North of the Equator and Longitudes 32° 34' 52" East of Greenwich. It is bordered by Wakiso district on the south, west and north, Kira Municipal Council on the east and Lake Victoria on the south. Administratively Kampala is divided into 5 Municipalities which include; Kampala Central, Nakawa, Kawempe, Rubaga and Makindye, covering a total area of 189 Km² of which 169 Km² land and 19 Km² water [11]. The study duration was 4months from May to August 2018 and comprised of a sample size of 385 with a 10% non-response rate giving 424 enterprises.

3.2 Sampling.

Cluster sampling technique was used to select the enterprises among the clusters on which simple random sampling was done to get the study enterprises. These included; the manufacture of metal products, textile and clothing, bricks and concrete products, repair of equipment and machinery, recycling of paper and paper products and other manufacturing. The actual enterprises were selected proportional to size at cluster level. The owner of the enterprises and one employee selected at simple random sampling were interviewed by the research assistants using the questionnaires. A walk through survey was also undertaken by the principal investigator using the ILO adapted checklist.

Sample size of the study was determined using the following formula that yielded a representative sample meant for large populations [12].

$$n = \frac{Z^2 pq}{e^2}$$

Where *n* is the sample size

*Z*² is the abscissa of the normal curve that cuts off an area *α* at the tails (1- *α* equals the desired confidence level is 95% (1.96)

E is the desired level of precision (0.05)

P is the estimated portion of an attribute that is present in the population equal to 0.5 and *q* is the 1- *p*

Therefore the sample size $n = \frac{Z^2 pq}{e^2} = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2}$
= 385 plus 10% for non-response to give 424 enterprises.

2.3 Study population.

The study population comprised 8,652 enterprises in the key sectors (clusters) based on the Census of Business Establishments (COBE) for Uganda [13]. They included manufacture of metal products, textile and clothing, bricks and concrete products, recycling of paper and paper products, repair of equipment and machinery and other manufacturing. At the firm level, the owner and one of the informal sectors workers were considered for the study by simple random sampling.

3.4 Data collection.

Relevant information for the study was obtained from primary and secondary sources. Secondary data were obtained from relevant literature such as Scholarly articles, Annual reports, Acts of Parliament and text books. The primary data was obtained through the field survey using the questionnaires by research assistants from the informal non-food manufacturing sector employers, employees and key informants in the Ministry of Gender, Labour and Social Development, Kampala Capital City Authority, National Organization Trade Unions and Federation of Uganda Employers. Seven main clusters in informal non-food manufacturing sector were selected. A walk- through survey was also done using an International Labour Organization (ILO) adapted Workplace checklist at every selected enterprise to record the hazards and control measures in the workplace. Inclusion criteria consisted of those enterprises that had below 5 employees and willing to participate in the survey. The study excluded workplaces that were not involved in some sort of manufacturing of products from raw materials.

People who were not employed in the sector like students and apprentices those who had worked for less than one month and those who declined to participate in the study.

3.5 Data management.

Field checking of questionnaires was done after the field interviews, errors were immediately verified and corrected daily. The quantitative data collected was entered into Statistical Package for Social Scientists (SPSS) Version 20.0 software for analysis.

3.6 Statistical Analysis.

Descriptive statistics were generated using SPSS statistical software for windows (2011) version 20.0 (Armonk, NY: IBM Corp) for the demographic variables. Percentages and frequencies were reported in tables and graphical forms. The independent variables were; workplace hazards, legal framework, administrative measures, knowledge and attitudes on practices and acceptance levels while the dependent variable was adequate occupational safety and health at workplace influenced by the social environment and government regulation as the intervening variables.

3.7 Ethical Approval.

The ethical approval of the study protocol was done by the Makerere University School of Social Sciences Research Ethics Committee and Uganda National Council for Science and Technology. Permission was sought from the Ministry of Gender, Labour and Social Development and Kampala Capital City Authority. Participation of the study population was voluntary and each research participant signed a written informed consent form.

4.0 Results

4.1. Socio-demographic characteristics of respondents

Data on socio-demographic characteristics Table 1 below, was collected from 388 out of the 424 enterprises comprising of 388 employers (response rate was 92%). 263(67.8%) were male and 125(32.2%) female. Results showed that 40.7% of the respondents were aged 30 years and below (youth) while slightly less than a quarter (20.6%) were aged 31-40 years and 41-50 with 20.4% as 18.3% represented those aged above 51 years. The mean age of the respondents was 30 ± 2.16 years. A considerable proportion of the respondents (70.9%) were reported married followed by 26% who were single while 2.1% were divorced.

In terms of education, a half of the respondents 196(50.5%) had been exposed to at least some level of education equivalent to secondary level, 103(26.5%) had acquired primary level. Those who possessed higher education (tertiary/vocational) were 55(14.2%) as well as 20(5.2%) with degrees and those who had never attained any formal education level were the minority with 3.6%. Furthermore, most employers engaged themselves in their businesses thereby not employing workers as shown by a percentage of 288(58.8%) whereas employers who employed between 1-3 employees were only 82(21.1%) and 4-5 employees with 78(20.1%). On average, males (average=1.14) dominated the informal non-food manufacturing sector than females (0.24).

In terms of work characteristics, average years worked 1-5 years were 133(34.3%) while 132(34.0%) were above 11years of service in the informal sector. Most of them worked for 9 hours 327(84.3%) per day with only 61(15.7%) working for 8 hours per day with a mean number of hours being 8 ± 1.86 hours per day averaging 40 hours per week while 343(88.1%) worked for 6 days and above per week with a mean working rate of 5 ± 1.88 days per week.

Table 1 Socio-demographic characteristics of respondents (n=388)

Characteristic	Variable category	Frequency	Percent (%)
Sex	Male	263	67.8
	Female	125	32.2
Age category of respondents	30 Years & Below	158	40.7
	31-40 Years	80	20.6
	41-50 Years	79	20.4
	51 years & Above	71	18.3
	Mean age		30 ±2.16
Marital Status	Single	101	26.0
	Married	275	70.9
	Divorced	8	2.1
	Widowed	4	1.0
Education	Informal	14	3.6
	Primary	103	26.5
	Secondary	196	50.5
	Tertiary/Vocational	55	14.2
	Degree level	20	5.2
Period working in Juakali	1-5 Years	133	34.3
	6-10 Years	123	31.7
	10 Years & Above	132	34.0
Number of employees at work	0 Employees	228	58.8
	1-3 Employees	82	21.1
	4 or 5 employees	78	20.1
Working hours / day	1-8 Hours	61	15.7
	9 Hours & above	327	84.3
	Mean Hours		1.84
Working days / week	1-5 days	45	11.6
	6 days and above	342	88.4
	Mean Working days		1.88

Source: Primary data

4.2 Knowledge and attitudes on practices of workers on occupational safety and health

The knowledge and attitudes on practices of occupational safety and health was adequate among male respondents 257 (66.3) as compared to the female with 131(33.7% while 171(40.1%) for males and 117(30.2%) females had inadequate knowledge and attitude on practices to occupational safety and health ($p < 0.05$, $X = 23.9$, $df = 3$). The knowledge and attitude on practices of occupational safety and health was still very adequate among respondents with higher level of education 128(32.2%). There is a statistical significant relationship between educational status and knowledge of occupational safety and health ($p = 0.00$) at 95% level of significant $p < 0.05$. $X = 147$, $p = 0.003$, $df = 3$. Occupational safety and health practices were poor among respondents with no education 41 (10.5%) and relatively low 72 (18.5%) in respondents with primary education.

There is a statistical significant relationship between educational status and practice at 95% level of significance $p < 0.05$. The correlation results reveal that age/age groups have statistical significant relationship on occupational safety and health in the work place in the informal non-food manufacturing sector ($p = 0.00$) at 95% level of significant $p < 0.05$. $X = 51.3$, $p = 0.003$, $df = 3$. Injury rates are more prevent in age groups of 30 years and below due less knowledge and poor attitude. Further, period spent working in Informal sector exposed workers to knowledge and attitudes on practices of OSH and it revealed that people who had worked for 10 years and above had adequate knowledge of OSH 147(45.6%) and better attitude. There is a statistical significant relationship between working period and knowledge of OSH ($p = 0.01$) at 95% level of significant $p < 0.05$. $X = 87.5$, $p = 0.002$, $df = 2$. Regarding number of employees at work and knowledge and attitude on practices of OSH, it was

found out that a high number of employees 4-5 people in an organisation possessed knowledge of occupational safety and health than in other groups. There is statistical significant relationship between number of employees at work and knowledge and attitudes on practices of OSH at 95% level of significant $p < 0.05$, $X = 69.9$, $df = 2$. The results also

revealed a significant positive relationship between hours spend at work and knowledge, attitude and practices of OSH, those who spent less hours at work (less than 8 hours) were less knowledgeable about OSH unlike those who spent more hours at work ($p < 0.05$, $X = 19.8$, $df = 1$).

Table 2. Correlation of socio-demographic variables on knowledge and attitudes on practices of occupational safety and health in the informal non-food manufacturing sector

Variable	Category	Knowledge, attitudes on practices of OSH		Chi Square	P Value
		Adequate	Inadequate		
Sex	Male	257(66.3)	171(40.1)	23.9	0.003
	Female	131(33.7)	117(30.2)		
Age of respondents	30 Years & below	51(11.2)	12(3.80)	51.3	0.000
	31-40 years	176(55.9)	37(9.50)		
	41-50 years	144(22.5)	85(21.9)		
	51 years & Above	74(16.7)	61(15.7)		
Marital status	Single	39(10.10)	1(0.001)	17.1	0.002
	Married	266(68.5)	22(16.6)		
	Divorced	63(16.2)	32(8.20)		
	Widowed	44(11.3)	40(10.3)		
Education level	Illiterate	41(10.5)	19(4.80)	147.3	0.000
	Primary level	72(18.5)	17(4.70)		
	Secondary level	93(24.5)	54(13.9)		
	Higher(degree) level	128(32.9)	188(44.5)		
Period working in Juakali	1-5 years	69(17.9)	74(19.1)	87.5	0.002
	6-10 years	95(24.5)	111(28.6)		
	10 years and above	177(45.6)	83(21.4)		
Number of employees at work	0 employees	58(14.9)	65(16.8)	69.9	0.000
	1-3 employees	86(22.2)	87(22.4)		
	4-5 employees	157(40.5)	83(21.4)		
Hours spent at work	1-8 hours	61(15.7)	90(23.2)	19.8	0.004
	9 and above hours	327(84.3)	298(76.8)		

Source: Primary data

4.3 Knowledge on control/ preventive measures of

Knowledge on most preventive measures of occupational safety and health hazards variables averaged more than 3.5 on a Likert scale of 1-5 thus revealing a relatively high level of preventive measures (Table 3). Training and awareness and good house keeping evidenced by the highest mean values of all of the variables used to prevent and mitigate occupational safety and health hazards in the informal non-food manufacturing sector as indicated by mean of 4.55 and 4.36 respectively. Both of these were indicators of the existence of measures of occupational safety and health. However apart from good housekeeping which is relatively easy to implement, Training and awareness is always not the norm in the informal sector. This

preventive measures may not necessarily translate to actual practice in the workplace. The second highest mean value was adequate/appropriate use of PPE and occupational safety measures as shown by means of 4.28 and 4.12 respectively. However, the quality of PPE was inferior and inappropriate and in most cases it was only the apron or overcoat used. Fire extinguishers and carrying out risk assessment were found to have the same mean value of 3.59. It was further established that hazard identification as well as ensuring adequate supervision had different mean values of 3.78 and 3.58 while two indicator variables of Incident reporting/registering and workplace insurance evidenced the lowest levels of dispersion with mean values of 2.97 and 2.94 respectively.

Table 3. Preventative measures/mitigation of occupational safety and health hazards in the informal non-food manufacturing sector (n=388)

Preventive measure	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Dev.
Training and awareness	6(1.5%)	15(3.9%)	10(2.6%)	85(21.9%)	272(70.1%)	4.55	0.848
Adequate/appropriate use of PPE	6(1.5%)	36(9.3%)	5(1.3%)	135(34.8%)	205(52.8%)	4.28	0.988
Fire Extinguishers	43(11.1%)	73(18.8%)	10(2.6%)	138(35.6%)	124(32%)	3.59	1.389
Hazard Identification	8(2.1%)	36(9.3%)	27(7%)	278(71.6%)	39(10.1%)	3.78	0.826
Occupational safety measures	1(0.3%)	12(3.1%)	28(7.2%)	246(63.4%)	101(26%)	4.12	0.683
Good housekeeping	14(3.6%)	10(2.6%)	8(2.1%)	145(37.4%)	211(54.4%)	4.36	0.929
Incident reporting and registering	76(19.6%)	101(26%)	12(3.1%)	158(40.7%)	41(10.6%)	2.97	1.370
Ensure adequate supervision	26(6.7%)	72(18.6%)	10(2.6%)	211(54.4%)	69(17.8%)	3.58	1.173
Carrying out risk assessment	26(6.7%)	58(14.9%)	13(3.4%)	243(62.6%)	48(12.4%)	3.59	1.092
Workplace Insurance	103(26.5%)	63(16.2%)	14(3.6%)	171(44.1%)	37(9.5%)	2.94	1.431

Source: Primary data

5.0. Discussion

The knowledge and attitude on practices of occupational safety and health was adequate among male respondents 257(66.3) as compared to the female with 131(33.7%) (p<0.05. X=23.9, df=3). This was as a result of the informal sector being highly dominated by men. The knowledge and attitudes on practices of occupational safety and health was still very adequate among respondents with higher level of education 128(32.9%). There is a statistical significant relationship between educational status and knowledge of occupational

safety and health (p=0.00) at 95% level of significant (p<0.05. X=147, p=0.003, df=3). Occupational safety and health practices are poor among respondents with no education 41 (10.5%) and relatively low 72 (18.5%) in respondents with primary education. There is a statistical significant relationship between educational status and practice at 95% level of significance p<0.05.

According to a similar study, differences in how individuals are socialized and treated based on gender can lead to health disparities like wage gaps and

sexual harassment. Gender determines access to health work in many ways, which sometimes differ from or modify the influences of other social identities [14]. Consistently it has stated that men experience work accidents more frequently than women and their injuries are more severe. Male workers younger than 25 years are also more prone to work accidents than the rest of the workforce [15]. Elsewhere in the US, it has been urged that despite the rapid increase in the proportion of US women involved in paid labour over the last half of the decade, and in particular the participation of mothers in paid labour, women still spent few adult years in fulltime employment in many wealth economies. This holds even net of their socio-economic, racial, immigrant and other identities because of the different socialization of men and women and traditional division of labour around paid market and unpaid house work [16]. Furthermore, it has been stated that women are also differentially sorted into jobs within the occupation structure leading to differential exposures at work and varying total hazard exposure [17]. On the other hand women are said to be disadvantaged at work in many ways than men, occupying fewer highest level positions in organizations and the occupation structure [18]. It has been further found out that male workers were found to be 2.5 times more likely to report occupational injuries than female workers. This is due to the willingness of male workers to engage towards risk taking behaviour than female workers [19]. This has been also supported in other studies that found out that men experience work accidents more frequently than women and their injuries are even more severe [15].

Education provides knowledge and skills which can be used to avoid occupational safety and health hazards, according to a study, people with high education attainment are more likely to understand harmful exposures and avoid them [20]. Similarly, a Nigerian study conducted among welders reported that only 20% of those who had no formal education were aware of occupational hazards and safety measures compared to 78% among those who had primary education and 85% who had secondary education. Those with higher educational attainment may also be employed in more skilled but less hazardous jobs. Highly educated people are more likely to be in managerial, supervisory, clerical and administrative work than in manual or factory work. This shows that workers who are more educated are better prepared to apply the control measures than

informally educated and in most case they are the employers [21].

Further still a study in Thailand, found out that informal workers have less formal education than the formal ones. Majority 64% had only primary education, 28.7% had secondary education and only 7.1% had technical training or University degree. It states that absence of schooling and female education result in enhanced female mortality. The related health impacts of illiterate workers are less awareness of health hazards in working conditions that lead to injuries and occupational diseases as a result of poor apprehension of mitigation measures. Employers are obliged to provide training and awareness to staff in form of induction and on job training as well as refresher training to help reduce the injuries and accidents in the workplace [22]. International studies indicate that uneducated men are more likely to experience fatal automobiles crashes than more highly educated men and also asserts that the rate of serious non-fatal injury is higher for individuals of lower education levels, but less serious injury is not so clearly correlated with education [23].

The correlation results reveal that age /age groups have statistical significant relationship on occupational safety and health hazards in the work place in the informal non-food manufacturing sector ($p=0.00$) at 95% level of significant $p<0.05$. $X=51.3$, $p=0.003$, $df=3$. Injury rates are more prevent in age groups of 30 years and below due less knowledge and poor attitude. There have been similar studies were increase in age has been associated with health problems like sleep problems, heart diseases, stomach ache, stress, irritability and vision problems [24]. This is confirmed by Atlantic Collaborative for Injury Prevention (ACIP) that states that much research has been conducted on the high rates of adolescents, and practioners struggle to understand how to effectively prevent injuries in this age group. ACIP states that in the case of adolescents, social and economic determinants interact with a biological propensity for higher risk taking behaviors, so while risk taking has benefits and is part of the adolescent development, inappropriate or excessive risk taking brings with it increased risk of harm. Although not applicable to all adolescents, evidence has shown that pubertal neurological changes that impact risk perception, reward seeking and social image can increase risk to injury and endanger occupational safety and health [25]. Similarly, it has been revealed in Ethiopia that, working at young age increases risk of sustaining more occupational injury among factory

workers compared with older workers. This was attributed to the inaccessibility of OSH information, lack OSH training, lack of experience and low level of knowledge and skills among young workers [19]. On the other hand it has been urged that increased age was positively associated with exposure to work hazards [20]. This finding was however in contrast with the one reported by ILO, UNICEF and World Bank that young children appeared no less likely to be exposed to hazardous work than their older counterparts [26].

On the period spent working in Informal sector (Jua-kali) exposed workers to knowledge, attitude on practices of OSH, it revealed that people who had worked for 10 years and above had adequate knowledge of OSH 147(45.6%). There is a statistical significant relationship between working period and knowledge of OSH ($p=0.01$) at 95% level of significant $p<0.05$. $X=87.5$, $p=0.002$, $df=2$. Regarding number of employees at work and knowledge, attitude on practices of OSH, it was found that a high number of employees perhaps 4-5 people in organisation possessed knowledge of occupational safety and health than in other groups. This is due to worker to worker relationship and the seniors being able to advice the new and young workers. There is statistical significant relationship between number of employees at work and knowledge, attitude on practices of OSH at 95% level of significant $p<0.05$, $X=69.9$, $df=2$. The results also reveal that a significant positive relationship existed between hours spend at work and knowledge, attitude on practices of OSH, those who spent less hours at work (less than 8 hours) were less knowledgeable about OSH unlike those who spent more hours at work ($p<0.05$, $X=19.8$, $df=1$). However, more hours at work are most likely to bring about fatigue, stress, exhaustion, burnout leading to psychosocial hazards. Psychological hazards can be a precursor for physical and mechanical hazards in the workplace. Longer working hours have been known to increase physical and mental fatigue at work with reduction in precision and concentration at work leading to injuries [24].

Knowledge and attitudes on practices of occupational safety and health is adequate in the informal non-food manufacturing sector commensurate with education. There is a statistical significant relationship between educational status and knowledge, attitude on practices of occupational safety and health in the workplace. This is in contrast to studies conducted during the 1990s that suggested

that, the practice of occupational safety and health in small firms and the informal sector was non-existent largely due to illiteracy and lack of knowledge of occupational safety and health [3; 4; 27]. .

Conclusion

There is inadequate knowledge about the occupational safety and health hazards among the informal non- food manufacturing workers in Kampala Capital City Authority. The attitude on the occupational safety and health preventive measures is also poor hence few measures if any in terms of preventive measures are available to mitigate hazards. This may be attributed to low levels of occupational safety and health awareness, lack of occupational safety and health training, lack of top management commitment and low level of workers education in the sector. The sector requires urgent action to create awareness and training partly through mass media address the situation by the regulatory agency and Kampala City Capital Authority and relevant stakeholders and enforcement of the relevant OSH regulations

Disclaimer

The sponsors had role in the design, implementation and writing of the paper and choice of journal to publish this research paper.

Conflict of interest

All authors declare no conflict of interest

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