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Post-Intervention Assessment of Health-Related Quality of Life among Industrial Workers in Oyo State, Nigeria

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ABSTRACT

The occupational health interventions and the health-related quality of life (HRQoL) of industrial workers in Southwest Nigeria are examined. The study is grounded in the exploration of occupational health and safety culture, organisational commitment, and workers' awareness of occupational hazards, with a focus on the relevance of safety communication and training. A mixed approach was used, incorporating quantitative and qualitative data from a sample of industrial workers divided into intervention and control groups. The results indicate that participation in these health interventions significantly enhances workers' HRQoL by reducing exposure to occupational hazards and improving health outcomes. The study also identifies the key factors that influence the effectiveness of these interventions, including the role of managerial commitment and the implementation of a comprehensive safety culture. Findings suggest that targeted occupational health interventions can lead to substantial improvements in the physical, mental, and social aspects of workers' lives, thereby contributing to overall productivity and well-being.

Keywords: *Health-related quality of life, occupational health, safety, ergonomic programs, occupational hazards, and behavioural health programs*

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INTRODUCTION

Health-related quality of life (HRQoL) is a multidimensional concept that reflects an individual's perceived physical, mental, and social well-being over time (Centers for Disease Control and Prevention (CDC), 2020). In occupational health research, assessing HRQoL provides critical insight into how workplace conditions, occupational hazards, and health interventions affect workers' overall well-being and productivity (Karimi & Brazier, 2016). Industrial workers are particularly vulnerable to a range of health risks, including exposure to physical, chemical, ergonomic, and psychosocial hazards that can significantly impair their quality of life if not adequately addressed (World Health Organisation (WHO), 2018).

In Nigeria, especially in industrial regions such as Oyo State, a substantial proportion of the workforce is employed in manufacturing, processing, and production sectors that often lack rigorous occupational health and safety standards (Okunlola & Olufunke, 2017). These working conditions may contribute to adverse health outcomes, increased absenteeism, and diminished job satisfaction, thereby reducing overall well-being and productivity (Ezenwa, 2019). Recent public health initiatives and workplace interventions, ranging from occupational health education to improved ergonomics and medical access, have aimed to mitigate these issues (Olayemi et al., 2020). However, there is a paucity of empirical data evaluating the actual impact of such interventions on workers' HRQoL, particularly in the post-intervention phase.

This study, therefore, conducts a post-intervention assessment of the health-related quality of life among industrial workers in Oyo State, Nigeria. By evaluating changes in HRQoL following the implementation of targeted occupational health interventions, the study aims to provide evidence-based recommendations to improve worker well-being, enhance productivity, and inform policy development within industrial settings.

Health-related quality of life (HRQoL) is a key indicator of an individual's overall well-being, particularly within work environments where occupational exposures can have long-term health implications. In industrial settings, workers are frequently subjected to a range of physical, chemical, ergonomic, and psychosocial risks, often resulting in diminished physical and mental health. In Nigeria, and specifically in Oyo State, industrial growth has not always been accompanied by adequate occupational health interventions or policies. While several initiatives have recently been implemented to improve working conditions and promote health in industrial sectors, there is limited empirical evidence to evaluate the effectiveness of these interventions, particularly in terms of improving HRQoL.

Many previous studies in Nigeria have focused on general occupational hazards or safety compliance, with little attention to outcome-based measures such as post-intervention HRQoL. Without a clear understanding of the extent to which health interventions influence workers' well-being, policy-making remains reactive and poorly informed. Therefore, this study aims to fill this critical knowledge gap by assessing the health-related quality of life

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of industrial workers in Oyo State after the implementation of health interventions. The outcome will inform evidence-based decision-making for sustainable occupational health.

Hypotheses

i) There is no statistically significant difference in the mean level of health-related quality of life between industrial workers who enrolled in health and safety training (intervention group) and those who did not (control group).

ii) There is no statistically significant difference in the mean level of health-related quality of life between industrial workers who enrolled in ergonomic programmes (intervention group) and those who did not (control group).

iii) There is no statistically significant difference in the mean level of health-related quality of life between the industrial workers who enrolled in behavioural health programmes (intervention group) and those who did not (control group).

Literature Review

Quality of life is defined as an individual's perception of their position in life within the context of the culture and value systems in which they live, including their goals, expectations, standards and concerns. The health-related quality of life (HRQOL) is related to physical, psychological and social conditions of individuals or groups (WHO, 2015). Globally, 2.78 million people die at work from an occupational accident and work-related disease annually, of which 2.4 million are disease-related. An additional 374 million workers experienced non-fatal occupational accidents (ILO, 2019), which is a major contributor to work absenteeism, and morbidities such as musculoskeletal diseases and mental disorders (Lin et al., 2020). This indicates that work-related diseases represent the main cause of mortality at work, killing about six times more workers than occupational accidents (ILO, 2019). Hence, there should be more focus not only on occupational injuries but also on work-related diseases.

To reduce the incidence of injuries and improve the overall quality of life of industrial workers, different occupational health interventions have been demonstrated. These interventions include work redesign, safety training, ergonomic programmes, behavioural health programmes, introduction of legislation, workplace inspection, and health campaigns (Schoenfisch et al., 2017). A study on the effect of legislation and an occupational health intervention at the workplace revealed moderately strong evidence that

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occupational health and safety programmes significantly reduce the incidence of injuries and fatalities (Anderson et al., 2019).

The increasing incidence of occupational accidents and compromised health-related quality of life among industrial workers has led to the recommendation of many occupational health and safety interventions such as safety inspections and regulations, training, ergonomic programmes, and exercises (Van der Molen et al., 2018; Serra & Gelfo, 2019; Arslan et al., 2019). Van der Molen *et al.* (2018) studied the effectiveness of safety regulations in occupational injuries, diseases, and health interventions, industrial accidents, and their health-related quality of life, and their findings show that safety regulations do not reduce occupational injuries and do not improve the overall health-related quality of life of industrial workers.

A quasi-randomised controlled trial on the effectiveness of an ergonomics training program in disorders, job stress, quality of work-life, and work-related quality of life revealed significant improvement in the quality of life of the workers (Sohrabi et al., 2021). Another study on the effectiveness of an ergonomics intervention programme in an Iranian steel industry showed that the ergonomic intervention significantly improved the general health of the employees as well as their human resource capacity (Rostami et al., 2021). The effectiveness of workers' independence interventions has also been examined among industrial workers. The better the workers' independence, the better the quality of life of employees (Paskarini et al., 2019).

Physical exercise is also a recommended intervention for improved workers' health-related quality of life. According to a study on the effect of physical exercise on musculoskeletal problems, stress, and quality of life of workers, it shows that employees who enrolled in the physical exercise program reported a lower prevalence of musculoskeletal problems compared to the control group. There is no significant difference in the quality of life of those enrolled in physical activity and those who are not. Hence, physical exercise cannot improve the quality of life of employees (Serra & Gelfo, 2019).

METHOD

This study explores various occupational health and safety interventions, including health and safety training, ergonomic programs, and behavioural health programs. It also assesses their impact on workers' well-being and overall quality of life. The research is grounded in the exploration of occupational health and safety culture, organisational commitment, and workers' awareness of occupational hazards, with a focus on the relevance of safety

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communication and training. A mixed-methods approach incorporating quantitative and qualitative data from a sample of industrial workers divided into intervention and control groups was used. Frequency count, simple percentage, mean, and standard deviation were used for data analysis.

RESULTS AND DISCUSSION

Table 1: Participants' Distribution by Socio-demographics (Control Group, n = 106)

Variables		Frequency	Percentage
Age	20-25Years	38	36
	26-31Years	30	28
	32-36Years	10	10
	37Years and above	28	26
	Total	**106**	**100**
Sex	Male	73	69
	Female	33	31
	Total	**106**	**100**
Marital Status	Single	64	60
	Married	40	38
	Divorced/Separated	2	2
	Total	**106**	**100**
Ethnicity	Yoruba	76	71
	Igbo	24	23
	Hausa	6	6
	Total	**106**	**100**
Religion	Christianity	78	74
	Islam	26	24
	Traditional	1	1
	Atheist	1	1
	Total	**106**	**100**

Table 1 presents the demographic characteristics of the study participants, including age, sex, marital status, ethnicity, and religion. The majority of respondents (36%) were aged between 20 and 25 years, followed by those aged 26–31 years (28%), indicating that most participants were young adults. Male participants were 69% of the sample, while females accounted for 31%, suggesting a male-dominated workforce. Regarding marital status, 60% of the participants were single, 38% were married, and 2% were divorced or separated. Ethnic distribution revealed that Yoruba made up the largest group (71%), followed by Igbo (23%) and Hausa (6%). In terms of religion, the majority of respondents were Christians (74%), followed by Muslims (24%), with Traditional and Atheist adherents making up 1% each. This demographic profile shows a youthful, predominantly male, Yoruba-Christian population, which may influence the perspectives shared in the study.

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Table 2: Health-Related Quality of Life among the Control Group

S/N	Items	AL	MD	M	C	Mean	Std Dev
1	How would you rate your quality of life?	27 (26%)	46 (43%)	22 (21%)	11 (10%)	2.16	0.93
2	How satisfied are you with your health?	22 (21%)	48 (45%)	17 (16%)	19 (18%)	2.31	1.00
3	To what extent do you feel that physical pain prevents you from doing what you need to do?	19 (18%)	53 (50%)	18 (17%)	16 (15%)	2.29	0.94
4	How much do you need any medical treatment to function in your daily life?	28 (26%)	44 (42%)	22 (21%)	12 (11%)	2.17	0.95
5	How much do you enjoy life?	14 (13%)	47 (45%)	34 (32%)	11 (10%)	2.40	0.85
6	To what extent do you feel your life to be meaningful?	29 (27%)	38 (36%)	23 (22%)	16 (15%)	2.25	1.02
7	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	37 (35%)	40 (38%)	15 (14%)	14 (13%)	2.06	1.01
8	How well are you able to concentrate?	12 (11%)	38 (36%)	37 (35%)	19 (18%)	2.59	0.91
9	How safe do you feel in your daily life?	10 (9%)	58 (55%)	38 (36%)	0 (0%)	2.26	0.62
10	How healthy is your physical environment?	16 (15%)	31 (29%)	44 (42%)	15 (14%)	2.55	0.91
11	Do you have enough energy for everyday life?	6 (5%)	53 (50%)	22 (21%)	25 (24%)	2.62	0.91
12	Are you able to accept your bodily appearance?	9 (9%)	51 (48%)	34 (32%)	12 (11%)	2.46	0.81
13	Have you enough money to meet your needs?	25 (24%)	61 (58%)	16 (15%)	4 (3%)	1.99	0.74
14	How available to you is the information that you need in your day-to-day life?	11 (10%)	58 (55%)	25 (24%)	12 (11%)	2.36	0.81
15	To what extent do you have the opportunity for leisure activities?	31 (29%)	45 (43%)	24 (23%)	6 (5%)	2.05	0.87
16	How well are you able to get around?	17 (16%)	55 (52%)	24 (23%)	10 (9%)	2.25	0.84
17	How satisfied are you with your sleep?	20 (19%)	45 (42%)	20 (19%)	21 (20%)	2.40	1.01
18	How satisfied are you with your ability to perform your daily living activities?	13 (12%)	54 (52%)	29 (27%)	10 (9%)	2.34	0.81
19	How satisfied are you with your capacity for work?	14 (13%)	54 (51%)	20 (19%)	18 (17%)	2.40	0.92
20	How satisfied are you with yourself?	18 (17%)	53 (50%)	14 (13%)	21 (20%)	2.36	0.99
21	How satisfied are you with your personal relationships?	14 (13%)	57 (54%)	30 (28%)	5 (5%)	2.25	0.74

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22	How satisfied are you with your sex life?	21 (20%)	61 (58%)	19 (18%)	5 (4%)	2.08	0.75
23	How satisfied are you with the support you get from your friends?	23 (22%)	49 (46%)	23 (22%)	11 (10%)	2.21	0.90
24	How satisfied are you with the conditions of your living place?	18 (17%)	48 (45%)	25 (24%)	15 (14%)	2.35	0.93
25	How satisfied are you with your access to health services?	25 (24%)	55 (52%)	20 (19%)	6 (5%)	2.07	0.81
26	How satisfied are you with your transport?	24 (23%)	41 (39%)	25 (24%)	16 (14%)	2.31	0.90
Weighted Mean						2.29	0.88

Note that: AL = A little, MD = Moderately, M = Mostly, C = Completely

Table 2 provides an assessment of the health-related quality of life (HRQoL) among the control group. To interpret the data, response options were grouped into two categories: "little" (a little/moderately) and "complete" (mostly/completely), with an average benchmark score of 2.5. The overall weighted mean was 2.29, indicating a generally poor quality of life among participants. The findings show that the majority of respondents reported low satisfaction with key dimensions of HRQoL. Specifically, 69% rated their overall quality of life as "little," and 66% felt the same about their health satisfaction. Physical pain and the need for medical treatment also affected a large portion of respondents (68%). Emotional well-being was also poor; 73% reported experiencing negative feelings such as depression or anxiety to some extent, and 53% struggled with concentration. Over 60% felt unsafe in their environment and lacked satisfaction in areas like sleep (61%), energy (56%), and work capacity (64%). In terms of financial and social well-being, 82% reported having insufficient funds to meet their needs, and 72% lacked access to leisure opportunities. Access to daily information (65%), healthcare services (76%), and transportation (62%) was also notably inadequate. Social relationships were also weak: 67% were dissatisfied with personal relationships and self-perception, while 78% were unsatisfied with their sexual life, and 68% received limited support from friends. In summary, most participants in the control group experienced a suboptimal health-related quality of life, marked by economic hardship, poor physical and emotional well-being, limited access to essential services, and strained personal relationships.

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Table 3: Health-Related Quality of Life among the Intervention Group

S/N	Items	AL	MD	M	C	Mean	Std Dev
1	How would you rate your quality of life?	78 (74%)	2 (2%)	19 (18%)	7 (6%)	1.58	1.00
2	How satisfied are you with your health?	84 (79%)	2 (2%)	15 (14%)	5 (5%)	1.44	0.91
3	To what extent do you feel that physical pain prevents you from doing what you need to do?	26 (25%)	62 (59%)	13 (12%)	5 (4%)	1.97	0.75
4	How much do you need any medical treatment to function in your daily life?	36 (34%)	46 (43%)	20 (19%)	4 (4%)	1.92	0.83
5	How much do you enjoy life?	34 (32%)	6 (5%)	62 (59%)	4 (4%)	2.34	0.98
6	To what extent do you feel your life to be meaningful?	77 (72%)	3 (3%)	23 (22%)	3 (3%)	1.55	0.93
7	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	44 (41%)	24 (23%)	27 (26%)	11 (10%)	2.05	1.05
8	How well are you able to concentrate?	42 (40%)	3 (3%)	49 (46%)	12 (11%)	2.29	1.11
9	How safe do you feel in your daily life?	60 (57%)	4 (4%)	37 (35%)	5 (4%)	1.88	1.05
10	How healthy is your physical environment?	43 (41%)	2 (2%)	56 (53%)	5 (4%)	2.22	1.04
11	Do you have enough energy for everyday life?	20 (19%)	42 (40%)	33 (31%)	11 (10%)	2.33	0.90
12	Are you able to accept your bodily appearance?	25 (24%)	32 (30%)	45 (43%)	4 (3%)	2.26	0.87
13	Have you enough money to meet your needs?	25 (24%)	48 (45%)	27 (26%)	6 (5%)	2.13	0.84
14	How available to you is the information that you need in your day-to-day life?	20 (19%)	46 (43%)	31 (29%)	9 (9%)	2.27	0.87
15	To what extent do you have the opportunity for leisure activities?	28 (26%)	55 (52%)	17 (16%)	6 (6%)	2.01	0.81
16	How well are you able to get around?	17 (16%)	56 (53%)	19 (18%)	14 (13%)	2.28	0.89
17	How satisfied are you with your sleep?	53 (51%)	30 (28%)	13 (12%)	10 (9%)	1.81	0.99
18	How satisfied are you with your ability to perform your daily living activities?	58 (55%)	25 (24%)	20 (19%)	3 (2%)	1.70	0.88
19	How satisfied are you with your capacity for work?	56 (53%)	5 (5%)	30 (28%)	15 (14%)	2.04	1.18
20	How satisfied are you with yourself?	64 (60%)	6 (6%)	24 (23%)	12 (11%)	1.85	1.13
21	How satisfied are you with your personal relationships?	55 (52%)	7 (7%)	28 (26%)	16 (15%)	2.05	1.18

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22	How satisfied are you with your sex life?	67 (63%)	3 (3%)	28 (26%)	8 (8%)	1.78	1.08
23	How satisfied are you with the support you get from your friends?	47 (44%)	14 (13%)	40 (38%)	5 (5%)	2.03	1.01
24	How satisfied are you with the conditions of your living place?	56 (53%)	18 (17%)	27 (26%)	5 (4%)	1.82	0.97
25	How satisfied are you with your access to health services?	57 (54%)	24 (23%)	22 (21%)	3 (2%)	1.73	0.89
26	How satisfied are you with your transport?	53 (50%)	17 (16%)	19 (18%)	17 (16%)	2.00	1.16
Weighted Mean						1.97	0.97

Note that: AL = A little, MD = Moderately, M = Mostly, C = Completely

Table 3 assesses the health-related quality of life (HRQoL) among the intervention group. Response categories were collapsed into "little" and "complete," with a calculated response average of 2.5. The weighted mean score of 1.97, which falls below this threshold, indicates a generally poor quality of life among participants. A majority (76%) of respondents reported low overall quality of life, and 81% expressed low satisfaction with their health. Most also reported physical discomfort; 84% indicated that pain slightly interfered with their activities, while 77% required medical treatment. Furthermore, while 63% reported complete enjoyment of life, 75% stated their lives had little meaning. Emotional and psychological well-being showed mixed results. Although 64% reported some negative feelings, 36% experienced them severely. In contrast, 57% could concentrate completely.

Feelings of safety and environmental conditions were moderate, with 61% feeling unsafe and 43% indicating a poor physical environment. Economic hardship was evident; 69% lacked access to funds for needs, 62% had limited access to life-related information, and 78% had little opportunity for leisure. Access to services was similarly poor; 75% were dissatisfied with sleep, 79% struggled with daily activities, 77% had insufficient access to healthcare, and 66% lacked adequate transportation. Social and personal satisfaction also trended low. Most participants were dissatisfied with their work capacity (58%), bodily appearance (54%), personal relationships (59%), sexual life (66%), and the support they received from friends (57%). Additionally, 70% were unsatisfied with their living conditions. In summary, the findings reveal that HRQoL among the intervention group was generally poor, with most participants reporting inadequate access to health, social, economic, and environmental resources, as reflected in the low mean score of 1.97.

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Table 4: Post Intervention Health-Related Quality of Life among the Intervention Group

S/N	Items	AL	MD	M	C	Mean	Std Dev
1	How would you rate your quality of life?	4 (4%)	6 (6%)	29 (27%)	67 (63%)	3.50	0.77
2	How satisfied are you with your health?	21 (20%)	68 (64%)	7 (7%)	10 (9%)	3.42	0.91
3	To what extent do you feel that physical pain prevents you from doing what you need to do?	4 (4%)	9 (9%)	27 (25%)	66 (62%)	3.46	0.81
4	How much do you need any medical treatment to function in your daily life?	41 (39%)	52 (49%)	9 (9%)	4 (4%)	1.77	0.76
5	How much do you enjoy life?	5 (5%)	14 (13%)	26 (24%)	61 (57%)	3.35	0.88
6	To what extent do you feel your life to be meaningful?	5 (5%)	12 (11%)	21 (20%)	68 (64%)	3.43	0.87
7	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	66 (62%)	24 (23%)	3 (3%)	13 (12%)	1.65	1.01
8	How well are you able to concentrate?	2 (2%)	13 (12%)	21 (20%)	70 (66%)	3.50	0.78
9	How safe do you feel in your daily life?	9 (9%)	11 (10%)	25 (24%)	61 (58%)	3.30	0.97
10	How healthy is your physical environment?	0 (0%)	7 (7%)	16 (15%)	83 (78%)	3.72	0.58
11	Do you have enough energy for everyday life?	5 (5%)	4 (4%)	25 (24%)	72 (68%)	3.55	0.78
12	Are you able to accept your bodily appearance?	2 (2%)	14 (13%)	19 (18%)	71 (67%)	3.50	0.80
13	Have you enough money to meet your needs?	1 (1%)	9 (9%)	27 (25%)	69 (65%)	3.55	0.69
14	How available to you is the information that you need in your day-to-day life?	2 (2%)	11 (10%)	23 (22%)	70 (66%)	3.52	0.76
15	To what extent do you have the opportunity for leisure activities?	2 (2%)	15 (14%)	15 (14%)	74 (70%)	3.52	0.81
16	How well are you able to get around?	4 (4%)	12 (11%)	22 (21%)	68 (64%)	3.45	0.84
17	How satisfied are you with your sleep?	4 (4%)	12 (11%)	20 (20%)	70 (65%)	3.47	0.84
18	How satisfied are you with your ability to perform your daily living activities?	2 (2%)	10 (9%)	19 (18%)	75 (71%)	3.58	0.74
19	How satisfied are you with your capacity for work?	6 (6%)	8 (8%)	20 (20%)	72 (68%)	3.49	0.86
20	How satisfied are you with yourself?	5 (5%)	4 (4%)	24 (23%)	73 (69%)	3.56	0.78
21	How satisfied are you with your personal relationships?	3 (3%)	11 (10%)	35 (33%)	63 (59%)	3.53	0.79
22	How satisfied are you with your sex life?	2 (2%)	6 (6%)	35 (33%)	63 (59%)	3.50	0.69

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23	How satisfied are you with the support you get from your friends?	4 (4%)	6 (6%)	25 (24%)	71 (67%)	3.54	0.77
24	How satisfied are you with the conditions of your living place?	6 (6%)	9 (9%)	21 (20%)	70 (66%)	3.46	0.87
25	How satisfied are you with your access to health services?	3 (3%)	10 (10%)	28 (26%)	65 (61%)	3.46	0.78
26	How satisfied are you with your transport?	5 (5%)	16 (15%)	22 (21%)	63 (59%)	3.35	0.90
Weighted Mean						3.35	0.81

Table 4 presents the post-intervention assessment of health-related quality of life (HRQoL) among the intervention group. Responses were collapsed into two categories, “little” and “completely”, with a benchmark average of 2.5. The post-intervention weighted mean score of 3.35 indicates a significant improvement in HRQoL after the intervention. The results show marked enhancement across multiple indicators. Notably, 90% of participants reported complete satisfaction with their overall quality of life, and 84% were satisfied with their health. Pain and need for medical treatment were minimal for most, as 87% reported only slight disruption from pain and minimal reliance on medical treatment. Enjoyment of life and sense of meaning were also strong, with 82% and 84% respectively reporting complete fulfilment. Emotional well-being improved, with only 15% reporting intense negative feelings. Most respondents (86%) could concentrate fully, and 81% felt completely safe in their daily lives.

Environmental and physical conditions also showed improvement: 93% described their physical environment as healthy, 91% reported having full energy for daily life, and 85% were fully accepting of their bodily appearance. Financial and informational access improved; 90% had funds for daily needs, and 88% had full access to necessary life information. Access to leisure, mobility, and daily functioning also improved significantly, with over 84% reporting complete satisfaction in these domains. Most participants were satisfied with sleep (85%), daily activities (89%), and work capacity (84%). Personal and social relationships strengthened: 91% were completely satisfied with themselves, 87% with personal relationships, 92% with sex life, and 90% with support from friends. Lastly, high satisfaction was recorded in living conditions (85%), access to health services (87%), and transportation (80%). In summary, the post-intervention HRQoL within the intervention group was significantly high, with most respondents experiencing complete satisfaction in various aspects of life. The high mean score of 3.35 reflects the effectiveness of the intervention strategies, such as health and safety training, ergonomic programs, and behavioural health support.

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Table 5: T-Test Analysis on the mean Difference in Level of Health-Related Quality of Life between the Industrial Workers Enrolled to Health and Safety Trainings (Intervention Group) and those who were not (Control Group)

Level of Health-Related Quality of Life Between The Industrial Workers	Grouping	Mean	Std Dev	t-test for equality of Means						
				t	df	Sig	Mean Diff	Std Error Diff	95% Confidence Interval of Difference	
									Lower	Upper
	Intervention Group **(health and safety trainings)**	15.89	0.32	2.41	210	.017	0.133	0.05	0.24	0.02
	Control Group	11.76	0.43							

An independent sample t-test analysis was carried out to compare the mean scores of health-related quality of life between industrial workers enrolled in health and safety training (intervention group) and those who were not (control group), with a P-value of 0.017 and t-value of 2.41. The finding in Table 5 shows that a significant difference exists between the level of health-related quality of life between the industrial workers (intervention and control groups), and the mean difference is in favour of the industrial workers enrolled on health and safety training (intervention group), which implies that health and safety training is impactful on workers' level of health-related quality of life in the study coverage.

Table 6: T-Test Analysis on the mean Difference in Level of Health-Related Quality of Life between the Industrial Workers Enrolled to Ergonomic Programmes (Intervention Group) and those who were not (Control Group)

Level of Health-Related Quality of Life Between The Industrial Workers	Grouping	Mean	Std Dev	t-test for equality of Means						
				t	df	Sig	Mean Diff	Std Error Diff	95% Confidence Interval of Difference	
									Lower	Upper
	Intervention Group **(ergonomic programmes)**	6.47	2.55	4.88	210	.000	1.93	0.42	1.15	2.71
	Control Group	4.54	3.15							

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A t-test analysis was carried out to compare the mean scores of the level of health-related quality of life between industrial workers enrolled in ergonomic programmes (intervention group) and those who did not (control group), with a p-value of 0.000 and t-value of 4.88. The finding in Table 6 shows that significant difference exists between level of health-related quality of life between the industrial workers (intervention and control groups); the mean difference is in favour of industrial workers enrolled to ergonomic programmes (intervention group), which implies that ergonomic programmes are impactful on workers' level of health-related quality of life in the study coverage.

Table 7: T-Test Analysis on the mean Difference in Level of Health-Related Quality of Life between the Industrial Workers Enrolled to behavioural health programmes (Intervention Group) and those who were not (Control Group)

Level of Health-Related Quality of Life Between The Industrial Workers	**Grouping**	**Mean**	**Std Dev**	**t-test for equality of Means**						
				t	**df**	**Sig**	**Mean Diff**	**Std Error Diff**	**95% Confidence Interval of Difference**	
									Lower	**Upper**
	Intervention Group **(behavioural health programmes)**	14.03	0.55	3.48	210	.000	0.25	0.07	0.11	0.39
	Control Group	11.15	0.42							

A t-test analysis compares the mean scores of health-related quality of life between industrial workers enrolled in behavioural health programmes (intervention group) and those not enrolled (control group); p-value is 0.000 and t-value is 3.48. Table 7 shows a significant difference in the level of health-related quality of life between industrial workers (intervention and control groups), with the mean difference of the industrial workers enrolled in behavioural health programmes (intervention group). It implies that behavioural health programmes significantly affect workers' level of health-related quality of life.

This study revealed that health-related quality of life among the intervention and control groups was poor before the intervention. The majority of respondents did not have access to all the necessities of life as a measure of health-related quality of life. Another study on the level of wellness among industrial workers has also reported a significant reduction in overall wellness of industrial workers with greater burden among the aged and those with longer working hours (Lee et al., 2019). In contrast, a study on quality of life and the associated factors among younger industrial workers revealed a better quality of life among this population (Andrade et al., 2021). Similarly, a descriptive study on the predictors of HRQoL revealed that industrial workers had good physical health and had scored lower in the environmental domain (Malakeh et al., 2017).

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In the same vein, Aluko et al. (2016) conducted a study in Nigeria using a health facility and discovered that most employees were knowledgeable about hazards associated with their job functions. However, it was concluded that the high level of awareness demonstrated by the respondents did not translate into the observance of health and safety practices at the facility. It, therefore, means that the knowledge of hazards was inconsistent with the observance of safety practices. Construction workers had poor physical, social, and psychological domains, but in the environmental domain, they displayed a good quality of life (Zabeer et al., 2019). Chakraborty et al. (2017) investigated construction workers' occupational stress and quality of life, in addition to the incidence of musculoskeletal pain, and observed poor quality of life in all dimensions of quality of life.

The study revealed a significant mean difference in the level of health-related quality of life among industrial workers enrolled in health and safety training, ergonomic programmes, behavioural health programmes (intervention groups), and those who were not (control group). This result appears in this way because the intervention exposes the need for workers to appreciate their lives. The result aligns with Toole (2002), who asserts that safety training plays a role in management practices to improve safety performance and employees' performance.

Likewise, the findings support Khdair's (2011) opinion that it provides the means for making accidents more predictable (In other words, effective training is needed to make sure employees understand the work-related hazards to which they are exposed and how to prevent injuries to themselves and others (Stromme, 2013). It involved educating employees on the safety rules and procedures (Cabrera, 2007). The level of perceived hazards increases employee compliance with warning and instructions; hence, training all employees to identify and react against the hazards associated with the workplace is crucial (Vredenburgh, 2002).

Summary of findings

1. Health-related quality of life among the control group was poor, as the majority of the respondents asserted that they did not have access to all the highlighted necessities of life in the items used to measure health-related quality of life.
2. Likewise, the health-related quality of life among the intervention group was poor before the intervention, as the majority of the respondents asserted that they did not have access to all the highlighted necessities of life in the items used to measure health-related quality of life.
3. Post-intervention health-related quality of life within the intervention group is high, as the majority of the respondents asserted that they have complete access to all the necessities of life in the items used to measure health–related quality of life.

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4. There is a significant mean difference in the level of health-related quality of life between the industrial workers enrolled in health and safety training (intervention group) and those who were not (control group).
5. There is a significant mean difference in the level of health-related quality of life between the industrial workers enrolled in ergonomic programmes (intervention group) and those who were not (control group).
6. There is a significant mean difference in the level of health-related quality of life between the industrial workers enrolled in behavioural health programmes (intervention group) and those who were not (control group).

CONCLUSION AND RECOMMENDATIONS

Owing from the findings of the study, which revealed that significant mean difference exists in the level of health-related quality of life among the industrial workers enrolled to health and safety trainings, ergonomic programmes, behavioural health programmes (intervention groups) and those who were not (control group) and similarly with notable improvement in the quality of life of sampled industrial workers selected for intervention after the administration of intervention. It can be reiterated that every occupation and industry has some hazards and health risks that employees must contend with. But the more important issue is whether they are aware of or are not aware of the hazards associated with their respective job functions. The findings of this research necessitate further stimulation of critical awareness of the impacts of occupational hazards on quality of life. Therefore, when every industry cultivates a heightened sense of vigilance regarding potential occupational hazards, this will go a long way toward a desirable quality of life among industrial workers.

i. Quality, weather-sensitive, and durable PPE should always be provided for the employees free of charge by the management; when some of them become worn out, they should be replaced immediately.
ii. The health and safety units of the companies should organise seminars once a month for the factory employees on occupational hazards and the control measures, such as the use of protective equipment.
iii. There should be periodic counselling sessions for married employees and their spouses to sensitise them on the need to cooperate with their respective partners who might be saddled with demanding job time schedules, functions, and shifts.
iv. Job schedules, job demands, and shift work should be made responsive to the mental and social health needs of the employee.
v. Federal Ministry of Labour and Employment should provide the policy framework that will mandate the management of companies to give room for the factory employees to unionise, as that may enhance their mental and social health status when they have better bargains of welfare in terms of effort-reward equity.

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