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5. The Influence of Stress and Depression on Quality of Life among Residents of Cement-Producing Communities in Ogun State

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Abstract

Pollution of the environment increases because of growth in urbanisation and industrialisation in the West African region and the sustainability of the environment is dependent on the activities of people living in it which have implications on individual quality of life. The cement manufacturing industry, being one of the fastest growing in the region, has played a role in the crucial release of harmful and toxic pollutants not only to the environment but also to human health, causing life-threatening diseases that have in turn resulted in depression affecting the quality of life of residents in the area. Data were collected from 350 participants and residents in Ogun state within a 5 km radius of the cement factory. They analyzed using a sample t-test on stress & depression while multiple linear regression on the joint influence of the predictors on quality of life. The results indicated that stress had a significant impact on the quality of life of residents in cement-producing areas t=(345)=6.067;p<.05) and depression negatively influences the quality of life of the residents' well-being in the producing area t(339)=(5.86) p,<.05), however, both stress and depression jointly influence the quality of life [F (3,333) =31.115; p<.05]. The study shows that pre-existing deteriorated health conditions because of the stressors from the environment and the negative impact of pollution from industry brings about poor quality of life among residents in the cement-producing area. The study concluded that stress and depression have an impact on the quality of life of residents living in the cement-producing area.

Keywords: Cement-, Stress, Depression, Pollution, Quality of Life

Introduction

Quality of life (QOL) is defined by the World Health Organization as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (WHO, 2020).

Quality of Life within the field of health is the perceived quality of an individual's daily life, an assessment of and evaluation of how their well-being may be affected positively or negatively over time by a disease or disability this includes all emotional, social and physical aspects of the individual's life (WHOQOL, 2020). With this context, we are examining the quality of life as an overall sense of well-being, assessed based on basic infrastructural development, safety and security, environment, physical and mental health, livelihood, social amenities, and transport facilities which are all standard indicators of the level of development and livelihood strategies including their availability (Gregory, Johnson, & Pratt, 2009)

Hence from the moment we encounter our physical environment, we can evaluate how a person feels and behaves because of activities within it. Stress is not just the feeling of emotional or physical tension we get when we feel frustrated, angry, nervous or under pressure rather Stress is our psychological and physiological reaction to an event or condition that is considered a threat or challenge when we are unable to cope with situations in the environment or life at large (WHO, 2020).

Generally speaking, small amounts of stress can be good for us and motivate us to help us perform in our daily activities. Too much stress can cause physical and mental health problems, especially when we come in contact

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with stressors from the environment, (such as chemical, physical or climatic stressors) our body produces a response that leads to emotional and mental symptoms like Anxiety or irritability, from Depression to Panic attacks, Sadness, etc., as a result of continuous exposure to the stress just as much the major depressive disorder can lead to a variety of emotional and physical problems and can decrease one's ability to function at work and at home with signs like trouble sleeping, poor fatigue, poor concentration etc. and being exposed to an environment where there is the high level of industrial pollution will only make the effect on individuals severe.

The activities of industries have caused a wreck to human health and the cement industry contributes significantly to the imbalances in air quality. The key environmental emissions are nitrogen oxides (NOx), sulphur dioxide (SO2), and grey dust with other emissions such as carbon dioxide (CO2) from power generation and emission of Carbon monoxide (CO), (Abeanu, Madsen, Popentiu & Thyregod, 2004). The cement manufacturing industry has played a fundamental role in global economic development with construction constituting major infrastructural aspects worldwide, but its production is a major facilitator to the release of particulate matter. The major pollution problems coming from the cement industry are noise, dust and particulate matter emissions, which are emitted from different spots like raw material grinding, coal mills, clinker cool-in, storage silos, and packaging at almost all the stages of cement manufacturing, there is an adverse impact on the environment. During the blasting of the rocks, there are dust particles which spread into the environment and make it toxic. Along with this, there is noise pollution caused while extraction from the rocks occurs (Aqr, 2011).

However, Pollution of the environment which is caused by a host of human activities, differs in intensity and effect on the population of people living around with Pollution by industries as the major contributor to environmental degradation and biodiversity loss in the West Africa sub-region, especially Nigeria. Thus, a major environmental health challenge affecting everyone in low, middle, and high-income countries Is causing life-threatening ailments leading to ailment resulting into depression. The air pollutants and effluents released into water bodies with apparent water quality deterioration, noise coming from operating machines, and pollution from lime and cement-producing plants are seen as severe instigators of health hazards and life threats, such as Depressive symptoms, negatively affecting crop yields, buildings, and persons residing in the vicinity of these industries, while the Quality of life of residents which aims to capture the well-being in the totality of their existence to which an individual is healthy and comfortable, the cement activities in a residential area has not only disrupted the well-being but also triggered an increase in the prevalence of anxiety, depression with a lowered global life expectancy.

Statement of the problem

In recent years, there has been a growing global concern over pollution, and health hazards of residents of industrial area, this is evident from the moment we step out of our houses when we are greeted with a strange sight that reminds us that breathing clean air and enjoying suitable environment is more of a distant dream. While good health and environmental sustainability are essential to sustainable development, the 2030 Agenda reflects the complexity and interconnections with an increasing focus on the sustainability of the environment. Nigeria has the largest cement industry in West Africa, with an aggregate capacity of 58.9 million metric tonnes (MMT) per year Cement is not only common rather it is extensively used as an adhesive in the construction industries which is employed on highways, houses, bridges, commercial establishments, and flyovers makes its impact critical on the environment. (Andrew, 2018). The notion of cementing residents' health implies residents' ability to respond to environmental factors which helps to maintain a balance between self and the people of the environment. As desirable as this development of industrial activities is, it has become an albatross not to itself but to the people as well.

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While there are studies that indicate that high levels of pollution can impair affective responses, decreases muscular coordination, and cause hearing problems others reported mood change and reduce life span.

Consequently, addressing this challenge of polluted industrialized communities in maintaining the Goals of sustainable cities and communities is about making cities and human settlements inclusive, safe, resilient and sustainable. Smith and Turner (2020) highlighted the adverse effects of industrial pollution on health including respiratory illnesses, cardiovascular diseases and exacerbation of pre-existing health conditions. Studies on urban sustainability and pollution control in industrial cities emphasis the importance of clean energy initiatives to reduce the environmental impact of industrialized communities (Smith and Turner, 2020). Another study on Sustainable urban development and industrial pollution concluded that a combination of cleaner technologies, strict pollution regulations and public engagement has helped cities maintain their industrial activities while promoting sustainability (Chen & Zhao, 2019). This paper focuses on the influence of stress and depression on the quality of life of residents in cement-industrialized areas.

HYPOTHESIS

1. Influence of Stress on quality of life among residents of cement factories in Ogun State.
2. Influence of depression on quality of life among residents of cement factory in Ogun state.
3. There will be a joint influence of stress and depression on the quality of life among residents of cement factories in Ogun state.

METHODS

Participants

The target population for this study are the residents of Lafarge WAPCO cement factory in Itori Ewekoro and its other plant in Sagamu/ Ikorodu in Ogun state within a 5km radius from the cement factory site. The choice of these categories of residents was informed by several important facts: to represent the typical communities in which industrialization has expanded and how activities of the industries affect them significantly, easy accessibility because residential homes are situated a few kilometres away from industrial factories where they form a large concentration of population in the area. While some factors may be responsible for influencing the quality of life, numerous factors also affect an individual's mental health which this study tends to find, since there are correlation between proximity to industrial areas and the prevalence of respiratory illnesses and depression contributing to quality of life. The study concentrated on stress and depression on quality of life which are the independent variables used to assess its impact on quality of life in a cement-polluted environment.

Hence, a non-probability sampling technique was used to select a total of 350 respondents from 11 communities after geographically mapping out the distance of 5km from the cement industries. A total of 209 were examined in 6 communities around Sagamu, and 141 respondents from 5 communities in Ewekoro.

Design Instruments

A quantitative survey research design was employed using three standardized questionnaires to elicit information from the participants. It is divided into four sections as Socio-Demographic data form, the WHO-quality of life scale with a Cronbach's alpha of 0.78, the perceived stress scale with a Cronbach alpha of 0.81 and the depression scale with a value reliability of 0.87.

Procedure For Data Collection

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The participants had their confidentiality and voluntary participation assured while ethics in research were followed. The questionnaire was distributed with the aid of research assistants at the participants' households and workplaces within the radius of cement-producing factories to yield valid results.

METHOD OF DATA ANALYSIS

The demographic information of respondents was analysed using descriptive statistics presented in frequency counts and percentages while a sample t-test was used to analyse the hypothesis to determine the influence of stress and depression and multiple regression analysis was used to determine the joint influence of both variables.

RESULTS

Respondents' Characteristics

Table 1 presents the distribution of respondents' characteristics. The result showed that there were 179 (51.0%) males while there were 171 (49.0%) females. With regards to their age, 120 (33.4%) were 19 years and below, 193 (30.8%) were 20-29 years, 79 (24.3%) were 30-39%, 24 (6.8%) were 40-49 years, 16(4.4%) were 50-59 years and 1 (0.3%) was 60 years and above. On marital status, 216 (62,6%) were single, 125 (35.1%) were married and 9 (2.2%) were divorced, while based on the highest level of education, 9 (3.2%) were educated up to primary school, 207 (57.8%) up to JSCE/SSCE/O'Level, 64 (19.1%) had NCE/OND/Technical College, 56 (16.1%) HND/B.Sc., 10 (2.7%) had post-graduate, and 2 (1.0%) declined to indicate their age. The distribution of respondents by occupation showed that 70 (20.8%) were into business/trading, 42 (11.4%) were artisans, 43 (12.4%) were professionals, 19 (4.7%) were civil servants, 9 (4.2%) were sales/service providers, 140 (38.9%) were students, 2 (0.5%) were unemployed, 19 (5.7%) belonged to employment categories and 6 (1.5%) declined to indicate their occupation. The income distribution of the respondents was as follows: 119 (35.1%) were earning below 20,000, 68 (19.1%) earned 20,000-50,000, 18 (5.4%) earned 51,000-100,000, 26 (7.2%) earned 100,000 and above while 119 (33.2%) declined to disclose their income. Finally, with regards to their employer distribution, 36 (9.4%) were civil servants, 1 (0.5%) were self-employed, 174 (53.3%) were employed in private organisations, 126 (32.5%) were not employed and 12 (3.0%) declined to indicate their employer.

Table 1: Socio-demographic Characteristics of Respondents

		(n=201)		(n=149)		(n=350)	
		Freq.	%	Freq.	%	Freq.	%
Gender	Male	109	54.2	70	47.0	179	51.0
	Female	92	45.8	79	53.0	171	49.0
Age	19 years and below	87	45.5	33	23.4	120	33.4
	20 - 29 years	45	23.6	48	34.0	193	30.8
	30 - 39 years	40	20.9	39	27.7	79	24.3

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	40 - 49 years	12	6.3	12	8.5	24	6.8
	50 - 59 years	7	3.7	9	6.4	16	4.4
	60 years and above	0	.0	0	.0	0	.3
Marital Status	Single	139	69.2	77	51.7	216	62.6
	Married	59	29.4	66	44.3	125	35.1
	Divorced	3	1.5	6	4.0	9	2.2
Highest Level of Education	Primary School	6	3.0	3	2.0	9	3.2
	JSCE/SSCE/O'Level	124	62.0	83	55.7	207	57.8
	NCE/OND/Technical	30	15.0	34	22.8	64	19.1
	HND/B.Sc.	31	15.5	25	16.8	56	16.1
	Postgraduate	7	3.5	3	2.0	10	2.7
	Declined to indicate	2	1.0	1	.7	3	1.0
Occupation	Business/Trading	32	15.9	38	25.5	70	20.8
	Artisan	19	9.5	23	15.4	42	11.4
	Professional	25	12.4	18	12.1	43	12.4
	Civil servant	10	5.0	9	6.0	19	4.7
	Sales/Service provider	4	2.0	5	3.4	9	4.2
	Student	96	47.8	44	29.5	140	38.9
	Unemployed	2	1.0	0	.0	2	.5
	Others	9	4.5	10	6.7	19	5.7
	Declined to indicate	4	2.0	2	1.3	6	1.5
Income	Below 20,000	68	33.8	51	34.2	119	35.1
	20,000 - 50,000	33	16.4	35	23.5	68	19.1
	51,000 - 100,000	11	5.5	7	4.7	18	5.4
	100,000 and above	13	6.5	13	8.7	26	7.2
	Declined to disclose	76	37.8	43	28.9	119	33.2

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Employer	Civil service	20	10.0	16	10.8	36	9.4
	Self-employed	1	.5	0	.0	1	.5
	Private organisation	88	43.8	86	58.1	174	53.3
	Not employed	86	42.8	40	27.0	126	32.5
	Declined to indicate	6	3.0	6	4.1	12	3.0

Hypothesis one

The first hypothesis stated that stress will have a significant impact on the overall quality of life of residents in cement-producing areas in Ogun state.

The independent variable (stress) consisted of two categories (low and high stress) while the dependent variable was measured on a continuous scale. Thus, the hypothesis was tested using an independent samples t-test at a 0.05 level of significance. The result is presented in Table 2

Table 2 Independent samples t-test on impact of Stress on overall Quality of Life

Stress	***N***	***Mean***	***Std. Dev.***	***t***	***df***	***p***
Low stress	141	101.1	12.4	6.067	345	0.001
High stress	206	92.5	13.4			

The result showed that there was a significant difference in the quality of life of respondents with low and high stress [t (345) = 6.067; p < .05]. Respondents with low stress (mean = 101.1; s.d. = 12.4) reported a higher quality of life in comparison with those who had high stress (mean = 92.5; s.d. = 13.4). Thus, the hypothesis that stress will have a significant influence on the overall quality of life of residents in cement-producing areas in the Ogun State is accepted.

Hypothesis two

The second hypothesis stated that depression will have a significant influence on the overall quality of life of residents in cement-producing areas in Ogun state.

The independent variable (depression) was measured on a categorical scale which comprised two categories (no risk of clinical depression and risk of clinical depression) whereas the dependent variable (quality of life) was measured on a continuous scale. Hence, the hypothesis was tested using an independent samples t-test at a 0.05 level of significance. The result is presented in table 3:

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Table 3 Independent Samples t-test of depression on quality of life

Depression	*N*	*Mean*	*Std. Dev.*	*t*	*df*	*p*
No risk of clinical depression (mild)	95	102.4	13.4	5.86	339	0.001
Risk of clinical depression (chronic)	246	93.2	12.9			

The result showed that there was a significant difference in the quality of life of respondents based on their level of depression [t (339) = 5.86; p < .05]. Further examination of the result showed that respondents with no risk of clinical depression had higher scores in quality of life (mean = 102.4; s.d. = 13.4) compared with those who had a risk of clinical depression (mean = 93.2; s.d. = 12.9). Thus, the hypothesis that depression will have a significant influence on the quality of life of respondents in cement-producing areas is accepted and it was concluded that depression will significantly predict the quality of life of residents in cement-producing areas.

Hypothesis three

The third hypothesis stated that stress and depression will have a significant joint impact on the quality of life of respondents in cement-producing areas.

The hypothesis was tested using multiple linear regression analysis. The result is presented in Table 4

Table 4:Multiple linear regression of influence of stress and depression on quality of life of cement-producing respondents.

R = 0.468					
R^2 = 0.219					
Adj. R^2 = 0.212					
S.E.E. = 12.188					
ANOVA					
	Sum of Squares	Df	Mean Square	F	p
Regression	13866.335	3	4622.112	31.115	.001
Residual	49467.196	333	148.550		
Total	63333.531	336			

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Coefficients					
	B	Std. Error	Beta	T	p
(Constant)	80.359	6.241		12.875	.001
Stress	.834	.133	.333	6.267	.001
Depression	-.193	.092	-.123	-2.090	.037

The model significantly predicted quality of life [F (3, 333) = 31.115; p <.05]. The model predicted 21.9% of the variation in the dependent variable. All the two predictors significantly contributed to the model variation. Stress contributed positively [$\beta = 0.834$; $t = 6.267$; $p < 0.05$] implying that a higher level of stress led to higher quality of life among the respondents and depression [$\beta = -0.193$; $t = -2.090$; $p < 0.05$] contributed negatively to the model. The hypothesis that stress and depression will have a significant joint impact on the quality of life of respondents in cement-producing areas is accepted and it can be concluded that stress and depression will significantly impact the quality of life of residents in cement-producing areas.

DISCUSSION

The study examined the level of stress and depression on the quality of life of residents. The first research question in the study was what impact stress has on the quality of life of residents in Ogun State. Stress was a contributor to the level of quality of life of both cement-producing communities as shown in the distribution of stress among respondents, where the level of stress in producing cement areas shows that their level of stressors can be attributed to environmental factors such as pollution and noise which implies their mental state.

A review of quality of life studies in Nigerian patients with psychiatric disorders in 6 studies which employed the generic WHO quality of life scale reveals that quality of life is associated with socio-demographic factors like marital & employment status, and social support, while poor quality of life was associated with illness-related factors such as co-morbid medical problem, presence of depressive symptom and non-adherence to medication (Aloba, Fatoye, Mapayi and Akinsulore, 2013).

Findings from the study show that stress has a persistent positive influence on quality of life as the respondents' high level of stress is directed at facing the challenges encountered in the environment. According to the correlations of the variables, it indicated that a higher level of stress shows a poorer quality of life. Chishohm (1996) identified the effects of stress is lack of concentration, memory loss and errors in judgment. Krohe (1997) affirmed that stress has its implications for physical and mental well-being and when one is unable to cope with it only leads to psychological issues such as depression and anxiety. Oladepo & Oladejo (2011) findings contradict this study, their study affirmed that prolonged and continuous exposure to a polluted environment along with the noise from industrial activities can contribute to elevated stress. It activates many of the body's organs and eventually leads to physical and mental exhaustion because it decreases the function of the system, strains the

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body and consequently leads to illness, or even prolongs the illness we already have. Further findings from Akinboye (2002) study state that both major and minor stress contributed to the dimensions of quality of life the observations from the results in the study show that moderate stress is most times necessary and required for motivation, creativity and facing challenges to carry on daily activities which positively influence an individual quality of life and in support of the current study while stress only become negative when it is prolonged for an extended time then it will have an implication one's health. Akinboye, *et al.* (2002) further state that one's perception of stress determines the effect of stress, the way we perceive, interpret and appraise stressful events will determine its impacts, which aligns with this study that residents do not attribute their quality-of-life level to stress, hence stress significantly influences the quality of life.

The second hypothesis also reveals the level of depression among the producing proving that a high number of respondents in cement-producing communities are at risk of clinical depression (chronic). Depression among non-producing communities' respondents may be in line with emotional, and social problems experienced meanwhile depression in cement is more of an environmental concern, where emissions of harmful substances is likely to alter brain function causing mood disorders, defects and other disabilities, yet their risk of clinical depression (mild) is less

However, results from the findings show that depression negatively influences the quality of life of residents in the cement-producing area, it shows that the higher the level of depression the poorer the quality of life. The findings support Yusuf, Nuhu, Olisah (2013) study which says that emotional distress is experienced by people who suffer a certain ailment in the case of epilepsy, which manifests itself in the form of phobia, or panic disorder thereby compromising the quality of life at the level of psychosocial functioning. Another study by Aloba, Fatoye, Mapayi and Akinsulore (2013) on quality-of-life studies among Nigerian patients with psychiatric disorders supports the study findings that poor quality of life was associated with illness-related factors.

The third objective was to examine the influence of the two variables and its hypothesis in the study states the negative influence of these variables on physical, and psychological health, social relationships and environment, where higher levels of stress, and depression lead to poorer quality of life. Hence, results from the findings pointed out that as much as the two independent variables have a level of significance in quality of life only depression has a deep root of contributing negatively to the quality of life of residents. Slightly significant stress is necessary but the overreaction of it causes distress which leads to panic disorder.

Conclusion

This study examined the mental health level of how an individual in a perceived polluted community perceives their quality of life. The study indicated that stress, significantly the quality of life of residents, is attributed to individual biological makeup. A certain level of stress (good stress) is required to function in daily life, only continuous stress which is termed chronic could negatively influence quality of life but this is not experienced by the respondents because they see life and their community as something they could bare and cope with without overreactions. Meanwhile, depression influences the quality of life negatively. As expected, individual residents who are anxious develop phobic attacks which result in distress and consequently depression, they perceive their quality of life has been threatened. The higher the level of depression the poorer their quality of life. Depression causes impairment in psychological health, physical health, social relationships e.t.c., which consequently affects their quality of life. Hence, if we are going to achieve a substantial reduction in the global burden of mental health conditions because of an unhealthy environment, we have to address the socioeconomic status and

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environmental circumstances that drive them. The balance in individual well-being cuts across all stages of sustainable development goals. Exposure to socioeconomic & poor air quality adversity exerts its influence on mental health across the course of life by paying special attention to air quality and ultimately providing universal access to safe, inclusive and accessible, green and public spaces.

Implications

It is evident from the study that the effects of stressful life events, depression arising from life events and environmental consequences have collective and interactive adverse physical and mental health consequences on residents in polluted areas. For instance, loss of life based on health due to an unprotected environment from pollution hazards leads to mental health problems among residents such as anxiety, depression, post-traumatic stress disorder and a variety of other illnesses

Stress among community residents leads to reduced energy, difficulty in dealing with others and managing occurrences from the environment which is usually accompanied by a feeling of helplessness and powerlessness, the findings revealed that improvement in the quality of the environment will produce corresponding improvement in the quality of life.

The findings demonstrated that maintaining a balance between oneself and the requirements of the environment and avoiding phobic and unnecessary distress are important for mental health and general well-being stating that only stress at a minimal positive level is beneficial for health.

The study therefore serves as an awareness to sensitize Nigeria industries emitting gas and particles during manufacturing to help reduce health hazards and other ailment that might be as a result of inhaling poisonous gas, dust, metal lethal and other chemical particles coming from their industries to the environment.

Recommendations

In meeting with the vision set out in the SDGs: a more flexible, cleaner living environment for the 100 million people who are expected to move to cities over the next 10 years, and for the almost millions of people living in cities today the industries is expected to reduce emission and follow the guidelines set out by environmental protection agency in the country. One of the unique contributions of this study is that it has demonstrated that stress is a necessary determinant and function of quality of life. It is needed to satisfy everyday life and hassle making one fit for environmental challenges, hence it's important to maintain a reasonable level of stress to combat environmental challenges.

From the study, depression is categorically a possible determinant of poor quality of life. This is evidence of how distress and unnecessary phobia in the face of threat could cause, it is therefore expedient for residents to maintain a good mental state level to combat environmental challenges and enhance their quality of life. Also, the findings reveal that the presence of physical health deterioration results in mental imbalance, hence it is suggested that residents should protect themselves from environmental hazards through the use of gadgets such as cyclones, venturi scrubbers, and electrostatic precipitators and equip themselves with information on how to eradicate environmental threats ranging from indoor pollution to outside pollution, specifically refurbishing the environment into a green-nature to trap air pollutant that might be coming from industrial activities and released to the environment.

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