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Research Article

Influence of Environmental and Psychosocial Factors on Functional Disability among Older Adults Attending a Geriatric Clinic in Ibadan, Oyo State, Southwest Nigeria

Olabisi Modupe Osimade[1]*, Lawrence A. Adebusoye[2], Osiki O. Jonathan[1]

[1]Department of Guidance and Counselling, Faculty of Education, University of Ibadan, Oyo State, Nigeria; [2]Department of Family Medicine, University College Hospital Ibadan, Oyo State, Nigeria

ABSTRACT

Background: Functional disability, a gradual decline in ability to perform major day to day activities is a major health issue in late life generating concerns all over the world. The function of the environment and inherent characteristics in older adults play a major role in determining the gradual and eventual effect of this decline. Previous studies had established the prevalence and associating co morbid factors of functional disability among the older population but very few studies explored the influence of psychological and environmental factors on functional disability in older adults.

Method: The study is a cross sectional study with population comprising of consenting male and female patients aged sixty-five years and above who present at the Chief Tony Anenih Geriatric Centre within the stipulated time frame for the study. A total of one hundred and fifty-eight respondents who consented to participating were selected for the study. Purposive sampling technique was used in selecting older adults aged 65 years and over for the study. Reconstructed questionnaire was used in obtaining information regarding demographic characteristics, living arrangements and background of the participants. Standardized questionnaires which were pretested on another sample of participants were used in obtaining participant's functional disability status, environmental and psychological factors predicting functional disability.

Results: Data was subjected to Pearson Product Moment Correlation (PPMC) showing the relationships between variables. The regression analysis presented the joint contribution of psychological and environmental factors on functional disability. Environmental and psychological factors each had significant relationship with functional disability at (r=-0.393, n=158, p (0.000) <0.05) and (r=-0.682, n=158, p (0.000) <0.05) respectively. The relationship between the environmental and psychological factors was also significant at (r=0.538, n=158, p (0.000) <0.05). The combined effect of the independent variables on functional disability with a coefficient multiple correlations R=0.68 and a multiple R2 of 0.0466 was also significant signifying that 46.6% of the variance was accounted for by the two predictor variables when taken together. The relative influence of the variables expressed as beta weights, viz: Psychological factors (β= -0.662, p<0.05), and Environmental factors (β= -0.037, p>0.05) on functional disability was also significant.

Conclusion: The study established relationships and influence of psychological and environment on the development of functional disability in older adults, thereby adding to already existing literature on functional disability in older adults. This is to further advance research on the well-being and general wellness of older adults in Nigeria and the world as a whole. The study can be adopted for further studies and in clinical practice.

Keywords: Functional disability; Psychological Factors; Environmental Factors; Older Adults

INTRODUCTION

The process of disablement in function in late life is an important health indicator that is capable of jeopardizing the mental health stability, quality of life and independence of the sufferer. This process represents a significant phase in the life of every aging

Correspondence to: Olabisi Modupe Osimade, Department of Guidance and Counselling, University of Ibadan, Faculty of Education, Ibadan, Oyo State, Nigeria, Tel: +2348164060420; E-mail: osimadeolabisi@yahoo.com

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adult [1]. Old age is a stage that is accompanied with multiple health challenges that bothers on the individual's ability to adjust and function effectively and disability rates at this time tend to be higher in people aged 80 – 89 years [2]. Functional disability is a term associated with difficulty in performing daily activities in major areas of function due to a health challenge. It is associated with multidimensional factors which may be evaluated in two domains: basic activities of daily living (BADLs) which encompasses tasks relating to self-care, personal grooming; and the other factor (instrumental activities of daily living (IADLs) relating to independence in performing social duties which may involve shopping, travelling etc. [3].

Variations in report and patterns of functional disability recorded among older adults in developing countries especially in Sub-Saharan Africa owe to a large extent differences in life expectancy [4], age, education, living conditions, family type etc. [5]. With life expectancy in Nigeria currently at 48 years for male and 50 years for female; placing the country in the World Life Expectancy ranking at 177 of 183 countries [6]; survival rate till the age of 60 years and over in Nigeria cannot be completely void of somatic disabilities. Previous studies on disability in elderly Nigerians have reported a very high prevalence rate of 88.3% [5] using the Basic Activity of Daily Living (BADL) and the Instrumental Activity of Daily Living (IADL). Moreover, as with most developing nations the average prevalence rate recorded in India 46.84% [7], Sri Lanka 10% [8] could be indicative of variations in methodology and instruments employed. Looking closely into the prevalence rates of functional disability all over the world, it can then be assumed that higher functional disability rates reflected an accumulation of health risk factors which span across a lifespan of burden of disease, injury and chronic somatic disabilities [9].

Risk factors of functional disabilities in late life had been variously explored in literature. Non-modifiable risk factors like age seems to be more consistent. On the other hand, gender, cultural differences, genetics, sedentary lifestyle, unhealthy behavior and lifestyle, environmental factors like household hazards, disadvantaged neighborhoods conditions, mobility, inherent psychological factors like depression, cognitive impairment, personality etc., in relation to the process of disablement in function had been sparsely studied [10]. Although psychological factors in the development of functional disability has been less studied, mental health status and the process of disability in function are progressive psychodynamic processes often associated with other underlying co-morbid age related conditions [11]. This study will explore depression as a psychological factor influencing disability in function of older adults. Depression is a mental health disorder that causes repeated emotional dysfunction capable of increasing risks disability in virtually all areas of functioning in older adults [12]. Apart from obvious physical changes associated with late life depression, depressed older adults suffer an emotional state that makes it almost impossible for them to maintain their personal day-to-day hygiene [13]. Old age is a phase of life characterized by varying health issues leading to eventual decline in function both cognitively, emotionally and physically. Ageing in Nigeria predisposes older adults to certain conditions socially and economically which invariably predisposes them to psychological and physical health challenges [14].

Environmental factors accompanying the development of functional disability include and are not limited to living conditions, home modifications, availability of health care services and instruments, noise and air pollution etc. [15,16]. The home environment had been studied to be a major component in the healing process for older adults towards recovery from any health issue. Older adults are considered to be extremely sensitive to healthcare received from home rating recovery rate to almost 60% [17]. Talen & Koschinsky [18] noted that the impact of the environment in functional disability process in late life is important in either facilitating recovery or thwarting treatment. For instance, active or passive participation in religious or cultural activities for older adults may exert pressure on their psychomotor and cognitive abilities which in turn might be detrimental to their health. Despite close associations between environmental factors and the development of functional disability, environmental factors such as religious interference, economic development, pollution levels and health service availability in influencing older adults physical functioning has been less studied in Nigeria. This underscores the need to investigate the psychological and environmental influence in the process of disablement for older adults as past studies on functional disability has limited its scope on prevalence of disability and other co morbid medical challenges associated with functional disability.

This study is a descriptive survey study that seeks to investigate associated psychosocial and environmental factors of functional disability among older adults attending geriatric clinic in Ibadan, Oyo State Nigeria. This study also intends to add to existing knowledge and literature in Geriatrics which is an emerging medical specialty in Nigeria by providing quantitative information on psychosocial and environmental correlates of functional disability in order to facilitate effective recovery. In achieving the purpose of this study, five research questions are formulated to guide the study.

RESEARCH QUESTIONS

- Are there significant relationships between the environmental and psychological factor correlating functional disability in older adults?
- Are there significant relationships between the psychological factor and functional disability?
- Are there significant relationships between the environmental factors and psychological factor correlating functional disability in older adults?
- What is the combined effect of the psychological and environmental correlates of functional disability in older adults?
- What is the relative influence of environmental and psychological factors on functional disability in older adults?

RESEARCH METHODOLOGY

Population

A cross-sectional descriptive study carried out at the Chief Tony Anenih Geriatric Centre (CTAGC) of the University College Hospital (UCH), Ibadan. Ibadan is the capital city of Oyo State in the south-western area of Nigeria and has a population of over 180 million inhabitants. CTAGC is a purpose-built facility

for the care of elderly people and the first in Nigeria. It was commissioned on 17 November 2012 and manages patients both on in and outpatient basis. The centre has various specialty units such as physiotherapy, dietetics, geriatric lifestyle, ophthalmology, geriatric dentistry, memory, and geriatric psychiatry units. The population for the study consists of all older adults aged 65 years and over who presented at the geriatric center at the time of the study. They were comprehensively assessed using a checklist while those requiring further specialist care are referred to other specialty clinics within the University College Hospital, Ibadan.

Sample and sampling technique

Purposive sampling method was used in selecting one hundred and fifty-eight (158) consenting older adults for the study which gave all patients within this age bracket who presented at the centre at the period of the study an equal chance of being recruited. The sample consisted of ninety-four males and sixty-four females who meet the inclusion criteria which included that they must be registered at the centre during the period of the study and they must be an outpatient and not on admission in the facility. Older adults who were brought in on emergency and those whose consent to participate in the study could not obtained are excluded from the study.

Ethical considerations

Ethical approval for the study was obtained from the joint University of Ibadan and University College Hospital Ethical Review Board. Each respondent signed and thumb printed the informed consent form before being recruited into the study. Confidentiality of reports and responses were assured each respondent before the commencement of the study.

Instrumentation and Procedure

The study involved administration of structured questionnaires translated into local languages at the Department of Linguistics and African Languages, University of Ibadan to population of participants recruited for the study who had already had a general medical examination. The A part sought demographic information of respondents like age, gender, religion, ethnicity, marital status, family type and socio-economic characteristics like educational level, income, occupation (past and present), living arrangements, lifestyle habits, social support. The B part are tested and validated instruments, the Geriatric Depression Scale [19] GDS (short form), the Modified Berthel Index [20] and the Craig Hospital Inventory of Environmental Factors [21] pretested on another population of older adults in Catholic Hospital Oluyoro, Ibadan Oyo State to further establish the instrument's validity and reliability. The CHIEF is a 24-item self-report instrument that assesses the frequency with which people encounter environmental barriers related to five domains of human functioning which are attitudes and support, services and assistance, physical and architectural, policies and work and home environment as perceived by the individual. Functional disability was measured using the Modified Berthel Index; a 10-item simple to administer tool for accessing self-care and mobility activities of daily living in older adults. It is widely used in geriatric assessment with reliability, validity and overall utility rated at good to excellent. The psychological factor was measured by the GDS (short form) which is a "yes" or "no" questionnaire that focused on addressing depression in older adults. The shortened version of the scale, the GDS 15 has been cited as both valid and as reliable with respect to older adults in general practice with high correlation of r=0.89 compared to the long version of the scale. Other necessary physical examinations on the respondents were carried out by medical professionals and data relevant for the study were thereafter obtained at the appropriate quarters.

RESULTS

Data was subjected to statistical analysis using the Statistical Package for Social Sciences, version 17 (SPSS-17). Descriptive statistics such as percentages mean and standard deviation was calculated to illustrate distribution of socio-demographic and other relevant variable, with Pearson Product Moment Correlation (PPMC) showing the relationships between variables where necessary and probability level of $p<0.05$ will be taken as significant. Regression analysis was used in presenting joint contribution of variables (Table 1).

Table 2 shows the percentage level of depression (psychological factor) among older adults attending Geriatric Clinic in Oyo State. 34.8% (n=55) Adults were not depressed, and 65.2% (n=103) Adults were depressed. It could therefore be deduced that majority of the older adults attending Geriatric Clinic in Oyo state were depressed (Table 3).

Research Questions

Research Question 1: Are there significant relationships between the environmental factors and Functional disability among older adults attending Geriatric Clinic in Oyo State?

Table 4 shows that there is a significant relationship between the environmental factors and functional disability among older adults attending Geriatric Clinic in Oyo State (r=-0.393, n=158, p (0.000) <0.05). Hence, environmental factors influenced functional disability among older adults attending Geriatric Clinic in the study.

Research Question 2: Are there significant relationships between the psychological factor and Functional disability among older adults attending Geriatric Clinic in Oyo State?

Table 5 shows that there is a significant relationship between the psychological factor and Functional disability among older adults attending Geriatric Clinic in Oyo State (r=-0.682, n=158, p (0.000)<0.05). Hence, psychological factors influenced functional disability among older adults attending Geriatric Clinic in the study.

Research Question 3: Are there significant relationships between the environmental factors and psychological factors correlating functional disability among older adults attending Geriatric Clinic in Oyo State?

Table 6 shows that there is a significant relationship between the environmental factors and psychological factors correlating functional disability among older adults attending Geriatric Clinic in Oyo State (r=0.538, n=158, p(.000)<.05). Hence, environmental factors and psychological factors influenced functional disability among older adults attending Geriatric Clinic in the study.

Research Question 4: What is the combined effect of the psychological and environmental factors on functional disability in older adults?

Table 1: Social-demographic profile (n=158).

Gender		
Male	94	59.5
Female	64	40.5
Religion		
Christianity	87	55.1
Islamic	71	44.9
Tribe		
Yoruba	108	68.4
Igbo	41	25.9
Hausa	9	5.7
Marital status		
Married	147	93
Divorced	9	5.7
Separated	2	1.3
Family type		
Monogamous	98	62
Polygamous	60	38
Past Occupation		
Trading	52	32.9
Civil servant	81	51.3
Engineers	1	0.6
Farmers	15	9.5
Artisans	6	3.8
Lecturers	2	1.3
Clergy	1	0.6
Present Occupation		
Trading	72	45.6
Civil servant	64	40.5
Engineers	1	0.6
Farmers	13	8.2
Artisans	6	3.8
Lecturers	1	0.6
Clergy	1	0.6
Living arrangement		
Bungalow	33	20.9
Storey building	120	75.9
Duplex	5	3.2
Other occupants in the home		
Non-family members	5	3.2
Family Members	153	96.8
IR=Interquartile Range		

Table 2: Measures of geriatric depression among older adults attending Geriatric Clinic in Oyo State (n=158).

Interval	Mean index	Level of depression	Frequency (n)	Percentage (%)
0-4		Not depressed	55	34.8
5-15	5.7468	Depressed	103	65.2

Table 7 shows the joint contribution of psychological and environmental factors on Functional disability in older adults. The table also shows a coefficient of multiple correlation R=0.683 and a multiple R^2 of 0.466. This means that 46.6% of the variance was accounted for by the two predictor variables when taken together. The significance of the composite contribution was tested at β=0.05. The table also shows that the analysis of variance for the regression yielded F-ratio of 67.637 (significant at 0.05 level). This implies that the joint contribution of the independent variables to the dependent variable was significant and that other variables

Table 3: Functional disabilities among older adults attending Geriatric Clinic in Oyo State.

Barthel's Activities of daily living (BADL)	Frequency (n)	Percentage (%)
Bowels		
Incontinent or need Enemas	18	11.4
Occasional accident	68	43
Continent	72	45.6
Transfer (bed to chair and back)		
Unable, no sitting balance	7	4.4
Major help (1 or 2 people), can sit	18	11.4
Minor help (verbal or physical)	45	28.5
Independent	88	55.7
Bladder		
Incontinent or need Enemas	22	13.9
Occasional accident	76	48.1
Continent	60	38
Mobility		
Immobile	6	3.8
Wheelchair independent (including corners)	12	7.6
Walks with the help of 1 person (Physical or Verbal help)	54	34.2
Independent (May use Aid)	86	54.4
Grooming		
Needs help with personal care	34	21.5
Independent (including face, hair, teeth, shaving)	124	78.5
Dressing		
Dependent	16	10.1
Needs help-can do -	47	29.7
half unaided	95	60.1
Independent (including buttons, zips, faces etc.)		
Toilet use		
Dependent	18	11.4
Needs some help	34	21.5
Independent	106	67.1
Stairs		
Unable	31	19.6
Needs help (verbal or physical)	66	41.8
Independent	61	38.6
Feeding		
Unable	12	7.6
Needs help e.g. cutting	31	19.6
Independent	115	72.8
Bathing		
Dependent	32	20.3
Independent (bath or shower)	126	79.7

Table 4: Pearson Product Moment Correlation (PPMC) showing the relationship between environmental factors and functional disability in older adults.

Variables	Mean	Std. Dev.	n	r	p-value	Remarks
Environmental factors	44.1772	16.5381	158	0.393*	0	Sig.
Functional disability	14.8101	5.6198	~	~		

* Sig. at 0.05 level

Table 5: Pearson Product Moment Correlation (PPMC) showing the relationship between the psychological factors and functional disability in older adults

Variables	Mean	Std. Dev.	n	r	p-value	Remarks
Psychological factors	5.7468	3.5744	158	-.682*	0	Sig.
Functional disability	14.8101	5.6198	~	~		

* Sig. at 0.05 level

Table 6: Pearson Product Moment Correlation (PPMC) showing the relationship between environmental factors and psychological factors correlating functional disability in older adults.

Variables	Mean	Std. Dev.	n	r	p-value	Remarks
Environmental factors	44.1772	16.5381	158	.538*	0	Sig.
Psychological factors	5.7468	3.5743	~	~		

* Sig. at 0.05 level

Table 7: Summary of Regression analysis showing the joint contribution of psychological and environmental factors on functional disability in older adults.

R	R Square	DF	Mean Square	Adjusted R Square	Std. Error of the Estimate	Remark
0.683	0.466	~	~	0.459	4.13297	~
ANOVA						
Model	Sum of Squares	DF	Mean Square	F	Sig. p	Remark
Regression	2310.674	2	1155.337	67.637	0	Sig.
Residual	2647.629	155	17.081	~		
Total	4958.304	157	~	~		

not included in this model may have accounted for the remaining variance.

Research Question 5: What is the relative influence of environmental and psychological factors on functional disability in older adults?

Table 8 shows that the relative contribution of the independent variables to the dependent variable, expressed as beta weights, viz: Psychological factors (β=-0.662, $p<0.05$), and Environmental factors (β=-0.037, $p>0.05$). Hence, it could be deduced that psychological factor was significant i.e., could independently and significantly predict functional disability in older adults in the study.

DISCUSSION

The first research question asks if there is a significant relationship between the environmental factors and functional disability in older adults attending a geriatric clinic. The data established a significant relationship between the influence of environment on the progression of functional disability in older adult. This finding is similar to the study of Talen & Koschinsky [18] investigating walkable neighborhood and the onset functional disability in older adults. The study concluded that environmental factors are major determinants in the causative factors of functional disability in older adults, their argument centered on the fact that the environment helps in enhancing recovery if it is made conducive.

Szanton and colleague however offered a differing opinion on initiating programmes considered effective enough to facilitate quick recovery for assist older adults with chronic functional disability resident in low income rural areas [22]. In contrast to this submission however, a Nigerian study on functional disability among elderly Nigerian also attested to the influence of urban environment associated with increased risk factor of functional disability in elderly Nigerians [6].

Research question two asks for significant relationships between the psychological factor and functional disability among older adults. The study established a significant relationship between depression (psychological factor) correlating functional disability in older adults. This conclusion is in tandem with the findings of Akosile, Mgbeojedo, Maruf & Okoye, in their study of depression, functional disability and quality of life among Nigerian older adults. The study expressed that for each of the domains of functional disability, older adults are prone to depression. Correlations have similarly been established between domains of functional disability in older adults and depression in community dwelling older adults [13]. These studies found depression to be a major risk factor of decline in older adult's abilities to function effectively largely due to depressed older adults limited social interactions, feeling of worthlessness and guilt and sometimes thoughts of suicide and death.

Similarly, Aries, Dranan, Rahman & Shamsuddin [23] in their

Table 8: Summary of regression analysis showing the relative contribution of environmental and psychological factors on functional disability in older adults.

Model	Unstandardized Coefficient		Standardized Coefficient	T	Sig.
	B	Std. Error	Beta Contribution	-	-
(Constant)	21.351	0.943		22.646	0
Psychological factors	-1.041	0.109	-0.662	-9.504	0
Environmental factors	-0.013	0.024	-0.037	-0.536	0.592

study carried out on patients attending primary care, percentage of depressed older adults in their study was 17.0% indicative of a higher influence in comparison to other health problems identified in the study. Fiksenbaum and colleagues on the other hand expressed a different view on depression and functional disability labelling the former as a potential outcome of functional disability in older adults rather than a risk factor. Their study hypothesized the influence of disability in late life as a major risk for depression [24]. Existing relationship between environmental and psychological factors of functional disability in older adults was also significant. This in essence established the fact that psychological factors inherent in individuals could possibility predispose them to external factors that could pose a risk to their already worsening health status. Xie, Ma & Wang [16] established the combined relationships of perceived neighborhood, social cohesion and physical frailty on functional disability in older adults; the study highlighted environmental characteristics as a burden for functionally disabled older adults struggling with other medical comorbidities.

While most studies had explored the understanding of each of the environmental factors and psychological factors correlating functional disability in older adults, very few studies had documented relationships between these variables. There is however a growing concern for the influence of the environment in enhancing or impeding the ability of older adults to function effectively. Verbrugge and Jette [1], in the definition of the process of disablement in function in older adults emphasized the impact of the environment via societal demands and family expectations exceeding the individual's capacity to be able to live up to demands. Old age comes with changes in both physical and mental function. During this stage, the individual's ability to effectively process emotions and thoughts decline alongside decline in the physical characteristics. Calderon-Larranaga and others in their study of the psychological correlates of multimorbidity and the gradual accumulation of disability in older adults suggested that older adults should express positive attitudes towards life and health. Their debate on the biological and environmental factors as a leading cause of decline in function in late life established the need for researchers to employ the use of measures of psychological well-being in understanding the diverse and multifactorial process of ageing.

Research question four and five examined the joint and relative contribution of psychological factor and the environment on functional disability in older adults established to be significant. The development of disability in function in older adult is a progressive process with first symptoms noticed quite earlier in the life of the patient. The gradual decline may have been interplay in the function of the environment on the psychological disposition of the individual. Marlon, Aliberti, Kenneth and Covinsky in their study on modifying the home to reduce incidence of functional disability in older adults, established to effectively manage functional disability in older adult, change of environment is inevitable for individuals in communities that poses harm to their health before any major clinical intervention be done on their thought processes. In their study, cognitive impairment is identified as a major psychological risk factor of functional disability in late life and their conclusion is geared towards addressing the environmental defects in their thoughts before any psychological intervention.

CONCLUSION AND LIMITATIONS

In the course of the study, a few limitations are worthy of note. The study is carried out on hospital-based cohort attending a geriatric clinic which may not particularly portray adequate representation of older adults in Oyo State. The variables in the study is assessed with the use of self-reporting instruments which may have increased possible alterations on the reported relationships and influences recorded in the study. In addition, the presence of other co morbidities (if present) was not ascertained in participants who voluntarily expressed interest to participate in the study. Regardless of these limitations, the findings of this study however, produced the following conclusions: each of the independent variable (environmental factors and psychological factor) was significant when crossed with functional disability. The combined effect and relative influence of these variables are also significantly related to functional disability.

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