

Activities of daily living status of urban and rural-dwelling older adults in Delta State, Nigeria

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Abstract

Background: The population of adults aged 60+ years is growing in Nigeria and sub-Saharan Africa (SSA) hence the need to begin planning for geriatric care. Thus generating a data base of the functional status of older adults in SSA will be potentially useful for geriatric health care plans. Basic and instrumental Activities of Daily Living (ADL) of a sample of adults aged 60+ years in Delta State Nigeria were therefore, investigated for functional disability or impairment. **Materials and Methods:** Basic and Instrumental ADL questionnaires were used to measure the functional status of 600 respondents aged 60-80+ years randomly selected from rural and urban areas of Delta State, Nigeria. Information on background characteristics (age, gender, education and self-rated economic status) was also obtained from the respondents. **Results:** Prevalence of functional impairment was markedly lesser in ADL than IADL (25.5 vs 30.0%). Chi square analyses indicated that whereas prevalence of ADL impairment was associated with age ($P < 0.001$), gender ($P < 0.01$), education ($P < 0.01$) and economic status ($P < 0.001$), impairment in IADL was associated with only age and economic status ($P < 0.001$). Comparison of performance scores by Mann-Whitney U test, showed that rural respondents scored higher than their urban counterparts in IADL ($P < 0.05$) while the difference with respect to ADL was not significant. Analyses by domains indicated that prevalence of functional impairment was greater in ambulation, personal hygiene and toilet than in other ADL domains (23.6-36.5 vs 15.5-24.3%). Compared to other IADL domains, disability in housekeeping, shopping and financial management was greater (32.5-38.6 vs 16.9-32.5%). **Conclusion:** Prevalence of functional impairment amongst older adults in the Nigerian setting can be considered substantial especially among females, advanced age and low economic status respondents. The need for early geriatric care plans was indicated given the increasing population of older adults in SSA.

Keywords: ADL; IADL; functional disability; older adults; urban/rural dwellers.

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I. Introduction

Human functional fitness is associated with the ability to undertake normal daily activities without assistance or severely limited endurance (Milanović et al. 2013). However, fitness declines with age due to loss of bone and muscle mass (Tuna et al. 2009) and cognitive impairment (Harada et al. 2013) leading to dependency in older adults. Loss of functional fitness in old age can be retarded in order to promote healthy ageing by appropriate geriatric care interventions based on the knowledge of the functional status of the older adults. This can be ascertained through measures of performance in activities of daily living (ADL). ADL can be described as the routine or basic activities that individuals carry out normally on a daily or regular basis and independently. There are two ADLs, one is the basic ADL which indicates functional fitness in six domains: toilet, feeding, transferring or ambulation, dressing, personal hygiene and continence (Katz et al. 1963; Katz 1983). Instrumental activity of daily living (IADL) is the second measure and it is based on eight domains: mode of transportation, shopping, financial management, laundry, housekeeping, taking medications, food preparation and use of telephone (Lawton & Brody 1969). IADL involves more capacity to make decisions and interaction with the environment (n-Callenti et al. 2010). It therefore fills the gap left by basic ADL hence the use of both measures will provide wider information on the functional fitness status of older adults (Spector & Fleishman, 1998).

Although there are other measures of functional fitness and disability, ADL and IADL have been usefully applied in several studies across the world especially developed countries. They include studies on the association of ADL with age, gender, and morbidity and mortality (n-Callenti et al. 2010), dementia (e.g. Giebel et al. 2014; 2015), self-rated health (e.g. Hu et al. 2012), quality of life and depression (Wada et al. 2005; Haghgoo et al. 2013; Datta et al. 2014) and Parkinson's disease (Hariz & Forsgren, 2011). Although ageing is under-researched in SSA, ADL has also been the basis of some studies in Nigeria and other SSA countries. For

example, Gureje et al. (2006; 2008), Lasisi & Gureje (2010) and Akosile et al. (2018) have used ADL in their studies on disability, depression and quality of life of older adults in some parts of Nigeria. Similar studies have also been conducted in some SSA countries (e.g. Mwanyangala et al. 2010; Yaya et al. 2020; Harling et al. 2020).

However, these studies did not specifically address the need to develop a data base of functional fitness status in Nigeria or SSA countries for potential interventions. This is important in Nigeria where the care for the elderly has been within the traditional extended family system. This tradition is now under severe strain because of demographic changes, rural-urban migration and inadequate job opportunities for the children of the older adults. In addition the population of older adults in Nigeria is growing and it is among the 30 sub-Saharan African countries with a high population of ≥ 60 years old adults (Velkoff & Kowal, 2006) and it is likely that it may exceed 6% of the population by 2025 (Gesinde et al. 2011). Geriatric care is developed in high-income countries, but not in the third world especially SSA (Dotchin et al. 2013; Schatz & Seeley 2015). It is therefore important to record and monitor the functional status of older adults in Nigeria for the purpose of early intervention to minimize the burden of nursing care and the attendant cost. This study was therefore designed to ascertain the functional status of older adults aged 60+ years from a Nigerian rural and urban setting based on their performance in basic and instrumental daily living activities.

II. Materials and Methods

Source of data

Delta State is one of the 36 federating units of Nigeria and it is located in the area of the delta formation of River Niger from where it derived its name. The State is blessed with abundant agricultural, and oil and gas resources. Respondents aged 60 years and above were randomly selected from the three senatorial districts that make up the State. The respondents were 100/town or rural community for each district bringing the total number of respondents for the study to 600. Trained assistants used the ADL and IADL questionnaire to conduct interviews on a face-to-face basis after obtaining verbal consents of the respondents. Those who declined to participate were promptly replaced. Pidgin English was used for the interview where appropriate and the children of the respondents sometimes assisted in cases of disability. Age, gender, education and self-rated economic status were the socio-demographic information obtained from the respondents.

Measures

Functional status was measured across the 6 and 8 domains of ADL and IADL, respectively. The ability of the respondent to perform any of the ADL or IADL tasks independently (without assistance) scores one point and zero if unable or assisted in whatever form. Each domain is scored one point for correct performance thereby bringing the total available scores to 6 and 8 for ADL and IADL, respectively. Thus severity of functional impairment increases with lower scores. However, scores below 5 (ADL) or 7 (IADL) indicated impaired function while ≥ 5 or ≥ 7 is regarded as normal functional status.

Data analysis

Prevalence of impaired and normal functional status was calculated by percentage for all respondents and by socio-demographic characteristics. The association between functional status and socio-demographic characteristics was analysed with Chi square statistics. Mann-Whitney U test was used to analyse the difference between the ADL or IADL performance scores of urban and rural respondents. Graphical illustration was used to show performance in each of the ADL and IADL domains.

III. Results

The background characteristics of the respondents are presented in Table 1. The population decreased with increasing age while differences by gender and education were less than 12%. However, over two-thirds of the respondents were in the unsatisfactory economic status category. All the background characteristics were associated with ADL except location although the association was stronger with age and self-rated economic status (Table 2). On the other hand only age and self-rated economic status were associated with IADL (Table 2). Prevalence of ADL and IADL impairment tended to increase with advancing age and it was markedly higher in females than in males (Table 2). Similarly, prevalence of impaired basic and instrumental ADL was higher among respondents with lower education and those reporting unsatisfactory economic status while marginal differences occurred between urban and rural respondents (Table 2). By overall assessment prevalence of disability was greater in IADL than in ADL (Table 2).

Table 1 Socio-demographic characteristics of respondents

Variables		N=600	%
Age	60-69	256	42.7
	70-79	218	36.3
Gender	80+	126	21.0
	Male	324	54.0
	Female	276	46.0
Education	None/Primary	335	55.8
	Secondary/Tertiary	265	44.2
Self-rated economic status	Satisfactory	403	67.2
	Not satisfactory	197	32.8
Location	Urban	300	50.0
	Rural	300	50.0

Table 2 Functional status of older adults and the association with socio-demographic characteristics

Background variables		n	Prevalence of Functional Status [% (n)] by:					
			ADL			IADL		
			Normal	Impaired	X ²	Normal	Impaired	X ²
Age	60-69	256	82.0(210)	18.0(46)	27.15**	79.0(202)	21.0(54)	31.42**
	70-79	218	70.2(153)	29.8(65)		67.4(147)	32.6(71)	
	80+	126	57.1(72)	42.9(54)		50.8(64)	49.2(62)	
Gender	Male	324	80.2(260)	9.8(64)	5.50*	75.0(243)	25.0(81)	3.49
	Female	276	72.1(199)	27.0(77)		68.2(188)	31.8(88)	
Education	None/Primary	335	71.0(238)	29.0(97)	5.78*	67.8(227)	32.2(108)	3.46
	Secondary/Tertiary	265	79.6(211)	20.1(54)		74.7(198)	25.3(67)	
Self-rated economic status	Satisfactory	197	81.7(161)	18.3(36)	25.39**	77.7(153)	22.3(44)	17.11**
	Not satisfactory	403	61.3(247)	38.7(156)		60.0(242)	40.0(161)	
Location	Urban	300	78.7(236)	21.3(64)	0.370	73.3(220)	26.7(80)	0.512
	Rural	300	80.7(242)	19.3(58)		75.7(227)	24.3(73)	
All respondents		600	74.5(447)	25.5(153)	NA	70.0(420)	30.0(180)	NA

Significance: *P<0.01; **P<0.001

The results of the comparison of ADL and IADL scores between urban and rural-dwelling respondents can be seen in Table 3. By overall assessment, significant difference occurred between rural and urban older adults with respect to IADL but not with ADL. However, the analysis by background characteristics showed that significant differences between urban and rural-dwelling respondents occurred in ADL scores of age group 80+, females and those reporting satisfactory economic status with rural-dwellers performing better (Table 3). A similar trend was observed with IADL except in the category of satisfaction with economic status where there was no significant difference (Table 3).

Table 3 Comparison of the functional status of urban and rural-dwelling older adults by scores

Variables	Functional Status Median Score (Min-Max) by:				
		ADL		IADL	
		Urban	Rural	Urban	Rural
Age	60-69	4.0(2-6)	4.0(3-6)	5.0(2-7)	5.0(1-7)
	70-79	3.0(0-5)	3.0(1-5)	3.5(0-6)	4.0(0-6)
Gender	80+	1.0(0-3)	2.0(0-4)*	2.5(0-5)	3.5(0-5)*
	Male	2.5(0-6)	3.0(0-6)	4.5(0-8)	4.0(0-7)
	Female	2.5(0-6)	3.5(0-6)*	4.0(0-8)	5.0(0-8)*
Education	None/Primary	3.5(0-6)	3.0(0-6)	4.0(0-8)	4.0(0-8)
	Secondary/Tertiary	3.5(0-6)	3.0(0-6)	4.5(0-8)	6.0(0-8)
Self-rated economic status	Satisfactory	3.0(2-6)	4.0(3-6)*	4.0(2-8)	3.5(0-8)
	Not satisfactory	3.0(0-5)	3.0(0-6)	3.5(0-5)	4.0(0-6)
All respondents		3.5(0-6)	3.0(0-6)	3.5(0-8)	4.5(0-8)*

*P<0.05, significant difference from urban respondents (Mann-Whitney U) test

As shown in Figure 1, the differences between rural and urban respondents were marginal in the ADL domains of feeding, dressing and continence. However, rural respondents tended to have markedly lower prevalence of disability in the other ADL domains (Figure 1). Generally, ADL disabilities were markedly higher in the domains of ambulation, personal hygiene and toilet (Figure 1). Figure 2 shows that differences in the prevalence of impaired IADL domains between urban and rural respondents were also generally marginal. Generally, functional impairments were markedly greater in domains of housekeeping, shopping and financial management than other IADL domains (Figure 2).

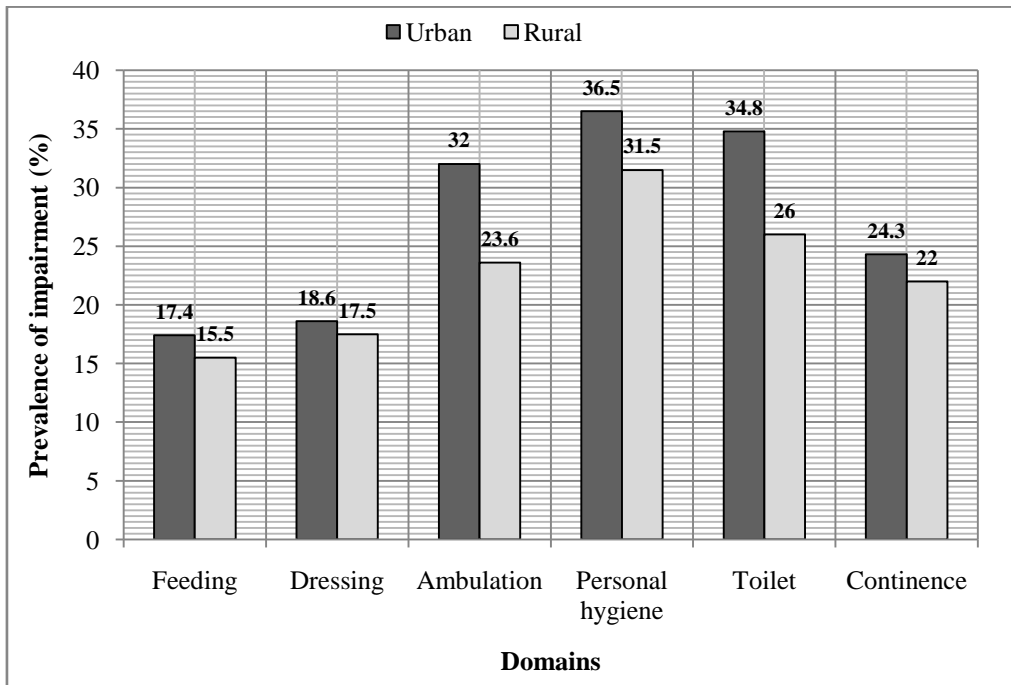


Figure 1 Prevalence (%) of impaired functional status by ADL domains

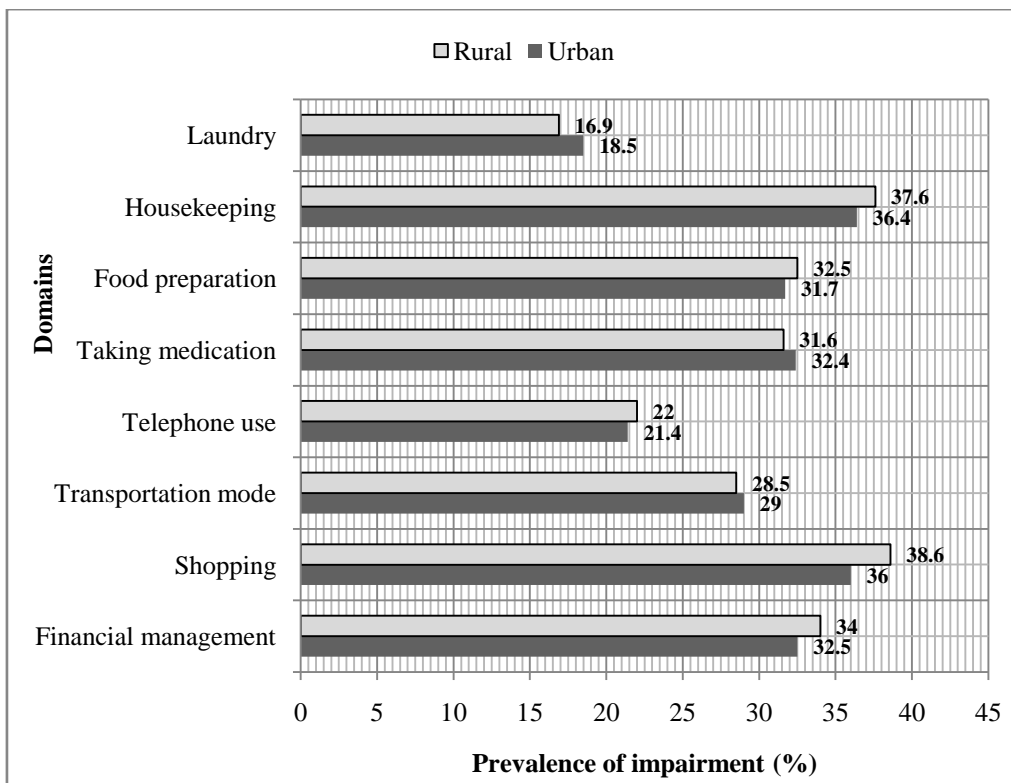


Figure 2 Prevalence (%) of impaired functional status by IADL domains

IV. Discussion

The population of respondents in the sample decreased with advancing age due to difficulties in gaining access to those in advanced age for the interview. However, the results showed that about one-quarter and one-third of the respondents had impairments in ADL and IADL, respectively. These results are not markedly different from the findings of a previous study in another Nigerian setting and they are also within the range reported by studies in some SSA countries. For example, Abdulraheem (2011) reported ADL disability prevalence of 12.1-28.3% among elders in a rural Northern Nigerian setting while the outcome of this study stood at 25.5-30.0%. In South Africa, one study reported 40% (Yaya et al. (2020) while another reported 12.2% among rural South African older adults (Harling et al. 2020). Prevalence of disability in ADL and IADL was 10 and 38%, respectively in an elderly Cameroonian population (Essomba et al. 2020). A study in Uganda showed that prevalence of ADL disability was 27.6 and 37.6% for men and women, respectively (Wandera et al. 2014). These few studies indicated a range of 10-40% prevalence of impairments in basic and instrumental ADL in SSA. Although the prevalence variations may depend on the setting and socio-economic conditions of the older adults, the range can be tentatively taken as a baseline for planning geriatric care in SSA especially as it is generally agreed that the data for prevalence of ADL disability in SSA is scanty.

Some background characteristics of the respondents were found to be associated with either ADL or IADL functional status or both while some were not. The association between age and ADL impairments was not unexpected because it is well known that physical function declines with advancing age (Tuna et al. 2009; Riebe et al. 2009; Milanović, 2013; Amarya et al, 2018). The finding of gender difference and its association with ADL is consistent with the reports from some studies while the absence of gender association with IADL is inconsistent (e.g. Zhang et al. 2005; Crimmins et al. 2010; Melvin et al. 2014; Alexandre et al. 2014; Sheehan & Tucker-Drob, 2019). These reports suggest that social vulnerability and the burden of household chores are factors likely to predispose women to ADL disability. However, there are few instances where gender difference in ADL impairment was not found (e.g. Sekhon & Minhas, 2014). The unexpected absence of gender association with IADL despite the marked difference between male and female prevalence of disability, could be traceable to the influence of modernization on traditional gender divisions in households. For example, the traditional African man is not likely to report doing housekeeping or preparation of food, but could go to the market for shopping and do laundry because of the presence of washing machines. Laundry and market were hitherto exclusively the function of females in the traditional African society.

With respect to education, there is paucity of information on the relationship with ADLs. A study in India showed that education could not predict ADL (Mograbi et al. 2014) whereas an association with ADL but not with IADL was observed in this study. However, the influence of education may be indirect through other health predictors because of its association with health-related quality of life (Luthy et al. 2015; Ran et al. 2017). The marginal differences between rural and urban older adults with respect to prevalence of impairment of basic and instrumental ADL was not surprising. Older adults who have always resided in the village are mainly those who remain at work till their physical movement is severely impaired and this gives them benefits of physical activity. On the other hand, urban-based retirees are likely to be physically inactive, but have the advantage of easy access to health care. Thus the likelihood of an urban/rural divide concerning functional disability becomes minimal.

That over two-thirds of the older adults were not satisfied with their economic status was not a surprise because of the absence of a social welfare scheme for the elderly in many SSA countries especially as it concerns retirees from the informal sector of the economy. Nigeria and many sub-Saharan African countries have pension schemes for only retirees from public service or organized private sector and none for the informal sector of the economy. The informal sector has the largest work-force that contributes significantly to the sustenance of the economy (Kalusopa, 2012). Even then many of those included in the pension scheme in Nigeria live in penury because payment of pension money is very irregular and is sometimes not paid for a long time (Ogunbameru, 1987; Ejechi, 2012). It is obvious that financial limitations can reduce access to health care, food and good accommodation thereby predisposing the older adults to functional disability.

The finding that impairment in IADL was higher than in ADL could be attributed to the greater cognitive demand of IADL (Borda et al. 2015) which declines with advancing age. It was interesting to observe that rural-dwelling older adults in this setting scored higher in IADL than their urban counterparts. It has been established that physical activity (PA) improves cognitive function (Mandolesi et al. 2018) and PA tends to be higher in the rural areas of SSA (Ejechi, 2015). This is supported by the observation that 80+ years' rural-based respondents scored better than the urban residents in basic and instrumental ADL because of the PA associated with non-retirement from work. The observation that rural-dwelling older adults reporting satisfactory economic conditions performed better in ADL can be attributed to greater income from farming or fishing due to continuity of work in old age. It is also a common practice for many public or formal private sector retirees to return to their villages from urban settlements to engage in small scale farming (fishing, poultry and crops) which yields income in addition to their pension money. Female older adults in the rural settings may also have performed

better in both ADLs than their urban counterparts for similar reasons of continuity of work and additional income generation. These differences indicate areas for intervention while planning geriatric and nursing care for older adults.

An indication of areas that require attention for geriatric care plans because of their high prevalence of impairments comes from the results of the ADL and IADL domains' performance results. For ADL, it includes ambulation, personal hygiene and toilet that involve physical exertion; and IADL domains of housekeeping, shopping and financial management that requires cognition. Cognition and physical demands in older adults can be improved in the course of geriatric nursing by promoting routine physical exercise (Mandolesi et al. 2018).

V. Conclusion

The prevalence of impairments in basic and instrumental ADL was substantial amongst the older adults investigated in this Nigerian setting. The findings were not markedly different from those reported from the limited studies conducted in SSA countries. The prevalence of the ADLs' disabilities was associated with age, gender, education and self-rated economic status with a tendency to increasing with advancing age and females being more disabled. The differences in disabilities between urban and rural-based older adults were generally marginal although rural-dwelling older adults tended to perform better when the ADLs' scores were considered. The better performance of rural-based older adults in IADL when compared to their urban counterparts, suggests that their cognitive decline was slower. Analyses of ADLs' impairments by domains indicated that ambulation, personal hygiene, toilet, housekeeping, shopping and financial management can be potential targets for geriatric health care interventions and planning. The paucity of information on functional disability and the increasing population of older adults in SSA make the data generated in this study a worthwhile contribution towards planning for the required number of geriatric nurses and clinicians in SSA.

References

- [1]. Abdurraheem, I. S., Oladipo, A. R. & Amodu, M. O. (2011). Prevalence and correlates of physical disability and functional limitation among elderly rural population in Nigeria. *Journal of Aging Research*, Article ID 369894, 13 pages doi:10.4061/2011/369894
- [2]. Akosile, C. O., Mgbejedo, U. G., Maruf, F. A., Okoye, E. C., Umeonwuka, I. C. & Ogunniyi, A. (2018). Depression, functional disability and quality of life among Nigerian older adults: prevalences and relationships. *Archives of Gerontology and Geriatrics*, 74, 39-43 DOI: <http://dx.doi.org/10.1016/j.archger.2017.08.011>
- [3]. Alexandre, T. S., Corona, L. S., Nunes, D. P., Santos, J. L. F., Duarte, Y. A. D. & Lebrão, M. L. (2014). Disability in instrumental activities of daily living among older adults: gender differences. *Revista de Saude Publica*, 48(3), 378-389. DOI:10.1590/S0034-910.2014048004754
- [4]. Amarya, S., Singh, K. & Sabharwal, M. (2018). Ageing process and physiological changes. *ntech Open*, <http://dx.doi.org/10.5772/intechopen.76249>
- [5]. Borda, M. B., Cano, C., Ruiz, C., Gutierrez, A., Ortis, A. & Samper-Ternet, R. (2015). Relationship between cognitive impairment and instrumental activities of daily living: Sabe Bogota, Colombia study. *Journal of the Neurological Sciences*, 357, e120-e141, doi: 10.1016/j.jns.2015.08.390
- [6]. n-Calenti, J. C. M., Tubío, J., Pita-Fernández, S., González-Abrales, I., Lorenzo, T., Fernández-Arruty, & Maseda, A. (2010). Prevalence of functional disability in activities of daily living (ADL), instrumental activities of daily living (IADL) and associated factors, as predictors of morbidity and mortality. *Archives of Gerontology and Geriatrics*, 50, 306-310
- [7]. Crimmins, E. M., Kim, J. K., & Sole-Auro, A. (2010). Gender differences in health: Results from SHARE, ELSA and HRS. *The European Journal of Public Health*, 21, 81-91. doi:<http://dx.doi.org/10.1093/eurpub/ckq022>
- [8]. Datta, D., Datta, P. P. & Majumdar, K. K. (2014). Relationship of activity of daily living with quality of life, *British Biomedical Bulletin*, 2(4), 757-764
- [9]. Dotchin, C. L., Akinyemi, R. O., Gray, W. K. & Walker, R. W. (2013). Geriatric medicine: service and training in Africa. *Age and Ageing*, 42, 124-128. Doi:10.1093/ageing/afs119
- [10]. Ejechi, E. O. (2012). The Quality of life of retired reengaged academics in Nigeria. *Educational Gerontology*, 38(5), 328-337. DOI: 10.1080/03601277.2010.544601
- [11]. Ejechi, E. O. (2015). Social activities of retired Nigerian academics: The applicability of the continuity theory. *Activities, Adaptation & Aging*, 39, 64-76. doi:10.1080/01924788.2014.966544
- [12]. Essomba, M. J. N., Atsa, D., Noah, D. Z., Zingui-Ottou, M., Paula, G., Nkeck, J. N., Noubiap, J. J. & Ashutantang, G. (2020). Geriatric syndromes in an urban elderly population in Cameroon: a focus on disability, sarcopenia and cognitive impairment. *Pan African Medical Journal*, 37, 229 doi: 10.11604/pamj-2020.37.229.26634
- [13]. Gesinde, A. M., Adedapo, A. O., & Iruonagbe, C. T. (2011). Counselling services for remediating the biopsychosocial challenges of the aged in Nigeria. *Journal of Functional Management*, 3(1), 89-98. Retrieved from: <http://eprints.covenantuniversity.edu.ng/id/eprint/637>
- [14]. Giebel, M. C., Sutcliffe, C., Stolt, M. & Karlsson, S. (2014). Deterioration of basic activities of daily living and their impact on quality of life across different stages of dementia: a European study. *International Psychogeriatrics*, 26(8), 1283-1293. Doi.org/10.1017/S104161021400
- [15]. Giebel, M. C., Sutcliffe, C. & Challis, D. (2015). Activities of daily living and quality of life across different stages of dementia: A UK study. *Aging & Mental Health*, 19(1), 63-71 doi.org/10.1080/13607863.2014.915
- [16]. Gureje, O., Ogunniyi, A., Kola, L. & Afolabi, E. (2006). Functional disability among elderly Nigerians: results from the Ibadan Study of Ageing. *Journal of American Geriatric Society*, 54(11), 1784-1789. doi:10.1111/j.1532-5415.2006.00944.x.
- [17]. Gureje, O., Kola, L., Afolabi, E. & Olley, B. O. (2008). Determinants of quality of life of elderly Nigerians: results from the Ibadan Study of Ageing. *African Journal of Medicine and Medical Sciences*, 37(3), 239-247.
- [18]. Harada, C. N., Love, M. C. N. & Triebel, K. L. (2013). Normal cognitive aging. *Clinics in Geriatric Medicine*. 29(4), 737-752

- [19]. Harling, G., Payne, C. F., Davies, J. I., Gomez-Olive, F. X., Kathleen Kahn, K., Manderson, L., Mateen, F. J., Tollman, S. M. & Witham, M. D. (2020). Impairment in activities of daily living, care receipt, and unmet needs in a middle-aged and older rural South African population: Findings from the HAALSI study. *Journal of Aging and Health*, 32(5-6), 296–307. DOI: 10.1177/0898264318821220.
- [20]. Hariz, G. M. & Forsgren, L. (2011). Activities of daily living and quality of life in persons with newly diagnosed Parkinson's disease according to subtype of disease, and in comparison to healthy controls. *Acta Neurologica Scandinavica*, 123, 20–27. DOI: 10.1111/j.1600-0404.2010.01344.x
- [21]. Haghgoo, H. A., Pazuki, D. E., Hosseini, A. S. & Rassafiani, M. (2013). Depression, activities of daily living and quality of life in patients with stroke. *Journal of the Neurological Sciences*, 328, 87–91. <http://dx.doi.org/10.1016/j.jns.2013.02.027>
- [22]. Hu, Y., Hu, G., Hsu, C., Hsieh, S. & Li, C. (2012). Assessment of Individual Activities of Daily Living and its Association with self-rated health in elderly people of Taiwan. *International Journal of Gerontology*, 6, 117–121
- [23]. Kalusopa, T. (2012). Analysis of social protection schemes in Africa. In T. Kalusopa, R. Dicks & C. Osei-Boateng (Eds.), *Social protection schemes in Africa* Windhoek: African Labour Research Network, Accra, Ghana (Chapter 2).
- [24]. Katz, S., Ford, A. B., Moskowitz, R. W., Jackson, B. A., & Jaffe, M. W. (1963). Studies of illness in the aged: The index of ADL: A standardized measure of biological and psychosocial function. *Journal of American Medical Association*, 185(12), 914–919.
- [25]. Katz, S. (1983). Assessing self-maintenance: activities of daily living, mobility, and instrumental activities of daily living. *Journal of American Geriatric Society*, 31(12), 721–7. doi.org/10.1111/j.1532-5415.1983.tb03391.x
- [26]. Lasisi, A. & Gureje, A. O. (2010). Disability and quality of life among community elderly with dizziness: report from Ibadan study of ageing. *The Journal of Laryngology & Otology*, 124(9), 957–962. <https://doi.org/10.1017/S0022215110000538>.
- [27]. Lawton, M. P. & Brody, E. M. (1969). Assessment of older people: self-maintaining and instrumental activities of daily living. *Gerontologist*, 9, 179–186.
- [28]. Luthy, C., Cedraschi, C., Allaz, A. F., Herrmann, F. R. & Ludwig, C. (2015). Health status and quality of life: results from a national survey in a community-dwelling sample of elderly people. *Quality of Life Research*, 24(7), 1687–96.
- [29]. Mandolesi, L., Polverino, A., Montuori, S., Foti, F., Ferraioli, G., Sorrentino, P. & Sorrentino, G. (2018). *Frontiers in Psychology*, 9, 509. doi: 10.3389/fpsyg.2018.00509.
- [30]. Melvin, J., Hummer, R., Elo, I., & Mehta, N. (2014). Age patterns of racial/ethnic/nativity differences in disability and physical functioning in the United States. *Demographic Research*, 31, 497–510. doi:<http://dx.doi.org/10.4054/DemRes.2014.31.17>
- [31]. Milanović, Z., Pantelić, S., Trajković, N., Sporiš, G., Kostić, R. & James, N. (2013). Age-related decrease in physical activity and functional fitness among elderly men and women. *Clinical Interventions in Aging*, 8, 549–556. <http://dx.doi.org/10.2147/CIA.S44112>
- [32]. Mograbi, D. C., Faria, C. A., Fichman, H. C., Paradelo, E. M. P. & Lourenço, R. A. (2014). Relationship between activities of daily living and cognitive ability in a sample of older adults with heterogeneous educational level. *Annals of Indian Academy of Neurology*, 17(1), 71–6
- [33]. Mwanyangala, M. A., Mayombana, C., Urassa, H., Charles, J., Mahutanga, C., Abdullah, S. & Nathan, R. (2010). Health status and quality of life among older adults in rural Tanzania. *Global Health Action*, 3:1, 2142. <https://doi.org/10.3402/gha.v3i0.2142>
- [34]. Ogunbameru, O. A. (1987). Nigeria: The possible crisis of retirement—An exploratory essay. *African Gerontology*, 1(5), 19–36.
- [35]. Ran, L., Jiang, X., Li, B., Kong, H., Du, M., Wang, X., Yu, H. & Liu, Q. (2017). Association among activities of daily living, instrumental activities of daily living and health-related quality of life in elderly Yi ethnic minority. *BMC Geriatrics*, 17, 74. DOI 10.1186/s12877-017-0455-y
- [36]. Riebe, D., Blissmer, B. J., Greaney, M. L., Garber, C. E., Lees, F. D. & Clark, P. G. (2009). The relationship between obesity, physical activity, and physical function in older adults. *Journal of Aging and Health*, 21(8), 1159–1178.
- [37]. Schatz, E. & Seeley, J. (2015). Gender, ageing and care work in East and Southern Africa: a review. *Global Public Health*, 10, 1185–1200. doi: 10.1080/17441692.2015.1035664
- [38]. Sehon, H. & Minhas, S. (2014). A study of Activities of Daily Living of elderly in an urban community of North India. *Scholars Journal of Applied Medical Sciences*, 2(4E), 1450–1454.
- [39]. Tuna, H. D., Edeer, A. O., Malkoc, M. & Aksakoglu, G. (2009). Effect of age and physical activity level on functional fitness in older adults. *Eur Rev Aging Phys Act*, 26, 99–106.
- [40]. Velkoff, V. A., & Kowal, P. R. (2006). Aging in sub-Saharan Africa: The changing demography of the region. In B. Cohen & J. Menken (Eds.), *Aging in sub-Saharan Africa: Recommendations for furthering research* (pp. 9–51). Washington, DC: National Research Council of the National Academies, National Academies Press. Retrieved from www.nap.edu
- [41]. Wada, T., Ishine, M., Sakagami, T., Kita, T., Okumiya, K., Mizuno, K., Rambo, T. A. & Matsubayashi, K. (2005). Depression, activities of daily living and quality of life of community-dwelling elderly in three Asian countries: Indonesia, Vietnam and Japan. *Archives of gerontology and Geriatrics*, 41(3), 271–280. <https://doi.org/10.1016/j.archger.2005.03.003>.
- [42]. Wandera, S. O., Ntozi, J. & Kwagala, B. (2014). Prevalence and correlates of disability among older Ugandans: evidence from the Uganda National Household Survey. *Global Health Action*, 7(1), 25686. DOI: 10.3402/gha.v7.25686
- [43]. Yaya, S., Idriss-Wheeler, D., Sanogo, N. A., Vezina, M. & Bishwajit, G. (2020). Self-reported activities of daily living, health and quality of life among older adults in South Africa and Uganda: a cross sectional study. *BMC Geriatrics*, 20, 402 <https://doi.org/10.1186/s12877-020-01809-z>
- [44]. Zhang, W., Li, W. & Feldman, M. W. (2005). Gender differences in activity of daily living of the elderly in rural China: Evidence from Chaohu. *Journal of Women & Aging*, 17(3), 73–89. DOI: 10.1300/J074v17n03_06

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