Economic Burden of Inpatient Wound Dressing in Nigeria: Implication for Catastrophic Household Expenditure

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Abstract

Background: The literature is replete with family impoverishment resulting from out of pocket healthcare financing on the Africa continent. In Nigeria the healthcare insurance scheme is evolving and requires wider coverage. The aim of this study is to examine catastrophic household expenditure emanating from daily or alternate day wound dressing.

Methods. The study was based on a descriptive cross-sectional research design to investigate the economic burden of daily or alternate day wound dressing among hospitalized patients in selected teaching hospitals in south west Nigeria. The inclusion criteria focused on inpatients about to be discharged or already spent minimum of four weeks in hospital. The data collection instrument was pre-tested with a coefficient of stability of 0.774. Respondents were selected via convenience sampling while an interview administered questionnaire was used to elicit information on wound care from patients in medical surgical wards. Covid-19 protocols were strictly adhered to and ethical approval was sought from each hospital.

Results: The result revealed that the mean age of the respondents was 44.95 ± 16.12 . Two-thirds were men who are artisans and traders with only secondary school education. Over 70% of the respondents have between 5 and 10 family members, more than 50% earn less than ₦50000 per month. The majority have no comorbidities (79.5%), about 50% were on daily dressing which required 1–5 moderate or major dressing packs per week. The length of hospital stay for the majority of the respondents (85.3%) was less than 11 weeks.

Conclusions: The daily or alternate day wound dressing requires a financial input beyond the coping capacity of the indigenous Nigerian families. The Nigerian government should scale up coverage of health insurance scheme to cover artisans, small traders and other low income earners to reduce the incidence of catastrophic household expenditure.

Introduction

Wound dressing is a major component of wound care protocol and requires high nursing intensity^[1]. Daily or alternate day wound dressing places a huge financial burden on the patients and health system and is likely to worsen in developing countries where resources are limited and health insurance coverage is inadequate^[3-8]. For instance, in 2010, a study conducted in South Western Nigeria revealed that over 40% of the patients spent about ₦500 (1.35US\$) on wound dressing alone per week^[9]. This was period when inflation was checked and before Nigeria went into an economic recession. These days, the actual cost of wound dressing is expected to have increased in geometric ratio. Also, in the same study, the authors posited that over 70% of the patients are small traders and were unable to meet the financial requirements of wound dressing. Nonetheless, studies in yore years have actually identified possible family impoverishment as a result of unending healthcare finances^[6, 10]

Furthermore, in South Western Nigeria, a diabetic foot ulcers (DFU) study by Odusan, Amoran and Salami^[11] revealed that 53% of the respondents earned less than ₦20,000 (54.13US\$) per month, 34% earned between ₦20,000- ₦49,000 (54.13US\$- 132.61US\$) per month while no respondent earned more than ₦100,000 (270.63US\$) per month. The result is similar to the findings of Ogundeji et al^[2] in the same geographical region of Nigeria which show that about 75% of the study respondents' monthly income was less than ₦50,000 (130.72US\$) and yet they would be required to spend between ₦2000 (5.41US\$) and ₦3000 (8.12US\$) on wound dressing materials per week. This is a menace that have ravaged an array of developing nations. In Nigeria, government is scaling up strategies to improve access to health insurance scheme but the benefits of the scheme are still largely for government workers and organized private sectors. In essence, inadequate access to medical care is by far causing perpetual disparities between the poor and the rich as the poor becomes poorer because of prolonged health care expenditure^[3, 12, 13]

Importantly, research evidence suggests that the high costs associated with wound management can be attributed to repeated dressing changes^[14]. Builders and Oseni-Momodu's^[15] study in Bingham University teaching hospital Jos Nigeria reported that 86.6% of the patients had dressing changes first twice per week and later weekly (29.9%). Similarly, in Odhiambo, Omondi and Magak's^[16] study on wound dressing techniques and costs at a County hospital in Kenya, wound dressing was done every third day while a study on the economic burden of wound dressing among patients attending the teaching hospital in South Western Nigeria indicated that more than 80% of the wounds required daily dressing^[2]

Consequently, in Nigeria, there is a paucity of data that specify the overall cost of inpatient wound dressings. Often when wound care cost are tracked, it is usually the cost of medical and surgical expenses while the huge care cost emanating from daily or alternate day wound dressing are neglected. This creates a major drawback in establishing the actual financial expenses incurred on wound dressing. This is a gap in most studies on wound care analysis and costing. Therefore, there is an urgent need for critical evaluation of the wound dressing cost component of wound management to improve data on the cost of wound dressing, budget and planning.

Material And Methods

The study was based on a descriptive cross-sectional research design to investigate the financial implications of wound dressing among hospitalized patients in selected teaching hospitals in South Western Nigeria. The choice of the hospitals was based on their capacity to accommodate and manage large population of patients with wounds and also known to be a centre of excellence for practice, research and training. Study sites included all the medical/surgical wards where nurses engaged in wound dressing.

The inclusion criteria focused on inpatients about to be discharged or who already spent a minimum of four weeks in hospital. The data collection instrument was subjected to a test-retest reliability test and

was found reliable with the coefficient of stability of 0.774. Data was collected from 190 patients across three teaching hospitals for a period of three months via an interview-administered questionnaire designed based on systematic literature review and the researchers’ previous field experience. The hospitals were selected through purposive sampling while the participants were selected through convenience sampling technique. Therefore, all in-patients with both acute and chronic wounds were recruited within the inclusion criteria. The data were collected during the covid-19 pandemic, therefore, precautionary measures of face masking, distancing and hand washing were strictly adhered to.

The collected data were entered into the Statistical Package for Social Sciences (SPSS) and analysed using descriptive and inferential statistics. The results were presented in percentages, mean and standard deviation. Ethical issues were considered from institutional to individual level; ethical clearance and permission were obtained from the Institutional Review Board (IRB) of each of the teaching hospitals: The National Orthopaedic Hospital, Igbobi, Lagos (OH/90/C/IX), the University of Ibadan/University College Hospital Ethical Committee (NHREC/05/01/2008a, 21/0047) and from the Obafemi Awolowo University Teaching Hospital Complex (ERC/2021/04/07). Verbal and written consent were also obtained from each of the participants while ethical principles of voluntariness, confidentiality, anonymity and non-maleficence were strictly upheld.

Results

Table 1: RESPONDENTS’ SOCIO-DEMOGRAPHIC CHARACTERISTICS

Patients' socio-demographic characteristics (n=190)	Frequency	Percent (%)
Age group (in Years)		
20-29	35	18.4
30-39	44	23.2
40-49	40	21.1
50-59	34	17.9
60 and above	37	19.5
Mean ($\pm$ SD)	44.95 $\pm$ 16.12 years	
Range	20 to 100 years	
Gender		
Male	119	62.6
Female	71	37.4
Highest level of Education		
No formal	10	5.3
Primary	39	20.5
Secondary	75	39.5
Tertiary	66	34.7
Family size		
Less than 5	51	26.8
5-10	136	71.6
More than 10	3	1.6
Mean SD	5.52 1.86 size	
Range	2 to 13 size	
Occupation		
Civil servants	29	15.3
Artisans	65	34.2
Trading	66	34.7
Retired	14	7.4
Unemployed	16	8.4
Monthly income (in naira-₦)		
Less than 50,000	101	53.2
50,000-100,000	66	34.7
101,000-150,000	6	3.2
151,000-200,000	11	5.8
More than 200,000	6	3.2
Mean SD	₦67,165 94,196.31	
Range	₦1300 to ₦1,000,500	

The table 1 above shows that 35 (18.4) of the respondents are within the age group 20–29 years, 44 (23.2 %) of the respondents are of the age group 30–39 years, 40 (21.1 %) of the respondents are of the age group 40–49 years, 34 (17.9%) of the respondents are of the age group 50–59 years and 37 (19.5%) of the respondents are within the age group 60 years and above. The average age of the respondents is 44 years. The table indicates that 119 (62.6%) of the respondents are male and 71 (37.4%) are female. It also indicates that 10 (5.3%) of the respondents have no formal education, 39 (20.5%) of the respondents have a primary education, 75 (39.5%) have a secondary education while 66 (34.7%) have a tertiary education.

Also, 51(26.8%) of the respondents have less than 5 family members, 136(71.6%) of the respondents have 5– 10 family members and 3(1.6%) of the respondents have more than 10 family members. It also indicates that 29(15.3%) of the respondents are Civil Servants, 65(34.2%) of the respondents are Artisans, 66(34.7%) of respondents are Traders, 14(7.4%) are Retired and 16(8.4%) of the respondents are unemployed. Lastly the table also indicates that 101 (53.2%) of the respondents receive less than ₦50,000 as a monthly income, 66(34.7%) of the respondents receive ₦50,000– ₦100,000 as a monthly income, 6(3.2%) of the respondents receive ₦101,000– ₦200,000 as a monthly income, 11(5.8%) of the respondents receive ₦151,000– ₦200,000 as a monthly income and 6(3.2%) of the respondents receive more than ₦200,000 monthly.

Table 2: WOUND AND DRESSING CHARACTERISTICS

Aetiology	Frequency	Percent (%)
Road Traffic Accident	65	34.2
Cancer	43	22.6
Fall	13	6.8
Pathological	32	16.8
Traumatic injury	14	7.4
Burn injury	5	2.6
Occupational injury	6	3.2
Gunshot injury	7	3.7
Others	5	2.6
Mean $\pm$ SD	21.11 21.17	
Diagnosis		
Tibiofibular fracture	35	18.4
Femoral fracture	31	16.3
Avulsion injury	24	12.6
Breast cancer	10	5.3
Cellulitis	15	7.9
Cervical cancer	8	4.2
Leg ulcer	8	4.2
Amputation	5	2.6
Head injury	6	3.2
Others	48	25.3
Mean $\pm$ SD	19 17.79	
Type of wound		
Open wound	58	30.5
Surgical wound	82	43.2
Burn injury	3	1.6
Leg ulcer	9	4.7
Diabetic foot ulcer	6	3.2
Cancer wound	23	12.1
Pressure injury	9	4.7
Mean $\pm$ SD	27.14 30.73	
Comorbidities		
None	151	79.5
Diabetes Mellitus	16	8.4
Hypertension	7	3.7
Diabetes and Hypertension	7	3.7
Anaemia	3	1.6
Arthritis	2	1.1
Others	4	2.1
Mean SD	27.14 54.81	
Frequency of wound dressing per week		
Two times	20	10.5
Alternate day	73	38.4
Five times	18	9.5
Daily	79	41.6
Mean SD	47.5 33.01	
Number and type of dressing packs used per week		
1-3 Minor	3	1.6

4-6 Minor	1	0.5
7 and Above Minor	12	6.3
1-5 Moderate	32	16.8
6-10 Moderate	28	14.7
21 and Above Moderate	1	0.5
1-5 Major	74	38.9
6-10 Major	35	18.4
11-15 Major	3	1.6
31 and Above Major	1	0.5
Mean SD	19	27.72
Length of hospital stay		
Less than 11 Weeks	162	85.3
11-20 Weeks	23	12.1
21-30 Weeks	2	1.1
31-40 Weeks	1	.5
51-60 Weeks	2	1.1
Mean SD	38	69.93

Table 2 above shows that 65 respondents (34.2%) had road traffic accidents followed by cancer with (22.6%), falls (16.8%), traumatic injury (7.4%) and the rest of the aetiology are less than 7%. It shows that tibiofibular fracture is 35(18.4%), femoral fracture is 31(16.3%), and Avulsion Injury is 24(12.6%) among others. It also indicates that a surgical wound is the most common among the respondents 82(42.3%), followed by an open wound 58(30.5%), cancer wound 23(12.1%) and others.

It also indicates that most of the respondents do not have any comorbidities (151, 79.5%). It shows that 79(41.6%) of the respondents dress their wounds daily, 373(8.4%) alternate days dressing, 20(10.4%) two times per week while 18(9.5%) dressing five times per week. Based on the number and type of dressing pack used per week, 74(38.9) of the respondents are on 1-5 major dressing, 35(18.4%) of the respondents are on 6-10 major dressing while 32(16.8%) are on 1-5 moderate dressing. The majority of the respondents 162(85.3%) spent less than 11 week in hospital while few of the respondents were admitted for 11 weeks and longer.

Discussion Of Findings

The result generally shows that the working population within the age bracket thirty and younger than fifty and dependent population who are sixty and older (table 1) are mostly patients who were hospitalized for various types of wound aetiologies ranging from road traffic accident, occupational injuries, traumatic injuries, pathological conditions including cancer related wounds (table 2). The study

finding is similar to studies which reported a rising population of elderly for wound related care. The finding is consistent with a Nigerian study by Rahman et al in Ogundeji et al^[2] which reported ages of sixty and older among patients hospitalized for wound related diagnoses.

From the results, two-thirds of the studied population were men (table 1) which is similar to Ogundeji et al^[2] which reported over sixty per cent male respondents in a similar study in South Western Nigeria. This not surprising because certain high-risk jobs such as riding motorcycle, driving buses and cars for commercial purposes, factory work which may result into wound related injuries are reserved for males. Studies which examined the proportion of females in high risk jobs and the incidence of traumatic injuries are sparse. Notwithstanding, from the traditional African perspectives, men are expected to be the bread winners of their families. These individuals are the workforce who drives the economy of the country and provides for the need of their families. Therefore, they are mostly hospitalized for various types of wounds.

Findings also revealed that two-thirds of the patients were artisans and traders (Table 1) which make them more prone to occupational injuries and road traffic accidents. Artisans work with various sharp, blunt instruments while some are employed in companies using heavy duty machines and instruments. Similarly, small traders and hawkers form a significant percentage of Nigeria's economy and are found everywhere on the highways. This alone explains why road traffic accidents (34.2%) are the leading cause of wound related hospitalization. Government employment is not easy to get in Nigeria partly because of an overwhelming population of youth as well as systemic corruption and ethno-religion biases. South Western Nigeria, which is the study setting is an educationally developed geo-political zone of Nigeria. This is exemplified in the result (table 1). From the findings, two-thirds of the studied population have not less than secondary school education. This result is also consistent with Ogundeji et al^[2] who reported over fifty per cent tertiary education among the study respondents.

Significantly, findings revealed that over fifty per cent of the population studied earn less than ₦50,000 as salary (table 1) and over seventy per cent have more than 5 family members. This finding is similar to the findings of Ogundeji et al^[2] in the same geo-political region of Nigeria who reported that over seventy five per cent of the respondents have more than 5 family members and earn less than ₦50,000 per month. However, Odusan et al^[11] in a study on cost of managing diabetic foot ulcers in South Western Nigeria reported a ₦20,000 salary for more than fifty per cent of the respondents, which is lower than our finding.

Also, more than fifty per cent are on daily or alternate day wound dressing requiring 1–5 moderate or major dressing materials per week. The result is consistent with a similar study by Ogundeji et al^[2] where more than eighty per cent of the patients were on daily wound dressing. The result is also in line with Builders and Oseni-Momodu's^[15] findings in Bingham University teaching hospital Jos Nigeria where about ninety per cent of the respondents were on alternate day wound dressing. Furthermore, findings are also consistent with alternate day dressing in a study conducted by Odhiambo et al^[16] in a County hospital in Kenya.

Furthermore, repeated dressing changes create a huge financial commitment and has far-reaching effects on the family finances and therefore stretches the limit of the family wound care financial coping capacity. Often, families use bizarre coping strategies such as substitution of payment for family basic needs such as dairy product for daily wound dressing. Some go further and sell household materials and investments to meet the huge economic demands of continuous wound dressing, which impoverishes the family. This finding confirmed a study in Bangladesh which concluded that the cost of healthcare affected the poor in the society the most and households spent about forty per cent of their income on healthcare finances. Furthermore, findings are similar to the outcome of a study conducted by Oreh^[10] and Aregbesola & Khan^[6] where family impoverishment was associated with protracted healthcare expenses.

Again, findings also revealed a surge in number of dependent citizens who are hospitalized for various types of wounds. About twenty per cent of the studied population were elderly (sixty-five years and older). This study does not specifically examine the types of wounds common among the elderly, however, it is known that malignancy and pathological conditions are common among the aged population. This finding concurs with Nussbaum^[17] and Guest, Vowden & Vowden^[18] who concluded that the increased cost of wound care among the elderly is associated with comorbidities such as diabetes and hypertension. Noteworthy is the increased number of cases of breast cancer (23%, table 2).

Breast cancer wounds are the second aetiological factor after road traffic accident wounds among hospitalized patients from study findings. It follows that, as the population increases, the risk of fracture, pathological conditions and malignancy increases and it is consistent with the results of the study conducted by Cheng et al^[14] and Narwade Saxena, Wasnik & Akhta^[19]. Although two-thirds of the study population are without comorbidities, the length of stay for most hospitalized patients was about 11 weeks and they are on daily or alternate day dressing. This finding is also consistent with the findings of Cheng et al^[14] and Narwade et al^[19] that an increase in the cost of wound care is related to an ageing population.

Also, most of the elderly people who are hospitalized were not enrolled in a health insurance scheme and were unable to finance their healthcare bill. It is disheartening that many of these elderly were forsaken in their old age and discharged against medical advice (DAMA) by their relatives because they could not meet the healthcare economic demands of the orthodox care settings. The Nigerian government has recently look into this direction by a bill to establish Senior Citizen Commission which is yet to be implemented. Payment strategies were poor and payment coping strategies include selling investments of many years such as landed property to settle catastrophic healthcare bills^[20]. This phenomenon is supported by an argument by Karimo et al^[12], Ogundeji^[13] and Aregbesola^[3] that the poor in the society have become poorer because of prolonged healthcare expenditure.

Conclusion

The study examined the catastrophic household expenditure emanating from daily or alternate day wound dressing. The cost incurred from repeated dressing changes is beyond the coping capacity of the indigenous Nigerian families who are ultra-poor. The escalating cost of providing daily wound dressing materials and consumables in Nigerian hospitals cause catastrophic household expenditure which impoverish families. The literature is replete with family impoverishment resulting from out of pocket healthcare financing on the African continent and the situation is not changing. From the study, the majority of cases were artisans, small traders and business people who earn less than fifty thousand naira per month. The individual is not enrolled in a health insurance scheme and is therefore incapacitated to finance the cost of daily or alternate day wound dressing.

Declarations

Ethical Approval and Consent to participate

Ethical issues were considered from institutional to individual level; ethical clearance and permission were obtained from the Institutional Review Board (IRB) of each of the teaching hospitals: The National Orthopaedic Hospital, Igbobi, Lagos (OH/90/C/IX), the University of Ibadan/University College Hospital Ethical Committee (NHREC/05/01/2008a, 21/0047) and from the Obafemi Awolowo University Teaching Hospital Complex (ERC/2021/04/07) all in Nigeria. Verbal and written consent were also obtained from each of the participant while ethical principles of voluntariness, confidentiality, anonymity and non-maleficence were strictly upheld.

Consent for publication

Not applicable

Availability of data and materials

Primary data was collected from hospitalized patients with wounds from the three hospitals in Nigeria. The data was analyzed by the statistical package for Social Sciences (SPSS) and presented in frequency table, percentage, mean and standard deviation

COMPETING INTEREST

The authors declare no competing interests as defined by BMC, or other interests that might be perceived to influence the results and/or discussion reported in this paper

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AUTHORSHIP

Each author have made substantial contributions to the manuscript and have approved the final submitted version

Authors' contributions

KD and PR conceived the study. KD and GB source for study materials. KD analysed data and wrote the first draft of the manuscript. PR and GB review the manuscript for intellectual content and suitability for publication. The final version of the manuscript was read and approved by all authors

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References

1. Ilesanmi R.E. and Ogundeji K.D. Nursing Intensity per Wound Care episode: A case of Poor Costing of Nursing Care in Nigeria. *West African Journal of Nursing*. 2020;30(2):36–46
2. Ogundeji K.D., Akinyemi K.F., Adeyemo A., Oluwaleke A.K., Ilesanmi R.E. Economic burden of wound care among patients in a Nigerian teaching hospital: Implications for Insurance Coverage in Nigeria; *African Journal of Nursing and Health Issues*. 2018; 9(2):139–154
3. Aregbesola B.S. Enhancing Political Will for Universal Health Coverage in Nigeria. *MEDICC Review*. 2017; 19(1): 42–46
4. Aregbesola B.S. and Khan S.M. Determinants of catastrophic health expenditure in Nigeria. *European Journal of Economics*. 2017. DOI: 10.1007/s10198-017-0899-1
5. Aregbesola B.S and Khan S.M. Predictors of Enrolment in the National Health Insurance Scheme among Women of Reproductive Age in Nigeria. *International journal of health policy and management*. 2018; 7(11), 1015–1023. DOI: 10.15171/ijhpm.2018.68
6. Aregbesola B.S and Khan S.M. Out-of-Pocket Payments, Catastrophic Health Expenditure and Poverty among Households in Nigeria. *International journal of health policy and management*. 2018; 7(9): 798–806. DOI: 10.15171/ijhpm.2018.19
7. Namomsa G. Assessing the practices and challenges of community based health insurance in Ethiopia: The case of Oromia National Regional State District of Gimbich. *International Journal of Advanced Research*. 2019; 7(5): 734–775. DOI:10.21474/IJAR01/9095
8. Adamu U.H. Evaluating Clients' Satisfaction with National Health Insurance Scheme in Jigawa State, Nigeria. 2019. *Texila International Journal of Public Health*; 7(3)
9. Lotz ME. The burden of wounds in a resource-constrained tertiary hospital: A cross-sectional study. *Wound Healing Southern Africa*. 2019; 12(1): 29-33
10. Oreh A.C. Universal Health Coverage – Is Leaving No One Behind in Nigeria a Pipe Dream? *American Journal of Public Health Research*. 2017; 5(5): 159–162. DOI: 10.12691/ajphr-5-5-4
11. Odusan O., Amoran O.E., Salami O. Prevalence and pattern of Diabetic Foot Ulcers among adults with Diabetes mellitus in a secondary health care facility in Lagos, Nigeria. *Annals of Health Research*. 2017; 3(2): 98–104
12. Karimo, T. M., Krokeyi, W. S. and Ekainsai, S. Z. Financial Burden Associated with Ill-Health: Evidence from the Elderly Population in Nigeria. *Equatorial Journal of Social Sciences and Human Behaviour*. 2017; 2 (1): 25–43.
13. Ogundeji K.D. Achieving universal health coverage through NHIS Voluntary Contributors Social Health Insurance Programme (VCSHIP): Implication for nursing education and practice. *Galore*

14. Cheng Q., Gibb M., Graves N., Finlayson K., Pacella R.E. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. *BMC Health Services Research* .2018; 18:421. <https://doi.org/10.1186/s12913-018-3234-3>
15. Builders M.I. and Oseni-Momodu E. A Survey of Wound Care in a Surgical Department in an Urban Clinical Setting in Northern Part of Nigeria. *International Journal of Clinical Oral and Maxillofacial Surgery*. 2018; 4(1):11–18. DOI 10.11648/j.ijcoms.20180401.13
16. Odhiambo P.A., Omondi K. and Magak N. Wound Dressing Techniques and Costs at a County Hospital. *Annals of African Surgery*. 2019; 16(1):33–37. DOI: <http://dx.doi.org/10.4314/aas.v16i1.8>
17. Nussbaum S.R., Carter M.J., Fife C.E., DaVanzo J., Haught R., Nusgart et al. An economic evaluation of the impact, cost, and Medicare policy implications of chronic non healing wounds. *Value in Health*. 2017; 1–6
18. Guest J.F., Vowden K. Vowden P. The health economic burden that acute and chronic wounds impose on an average clinical commissioning group/health board in the UK. *Journal of wound care*. 2017; 26(6). Available at <https://doi.org/10.12968/jowc.2017.26.6.292>.
19. Narwade P, Saxena D., Wasnik N., Akhta M. Non diabetic chronic leg ulcers: etiology and management. *International Surgery Journal*. 2019; 6(6):2070–2073
20. Ogundeji K.D., Akinyemi K.F., Faremi F.A. A Pilot Study on Nurses Awareness of NHIS-VCSHIP in Nigeria: Implication for out of Pocket Healthcare Expenditure. *Annals of Nursing and Practice*. 2020; 7(2): 1112.