

Received Date: 21 April 2026**Accepted Date: 12 May 2026****Published Date: 1 June 2026**

Assessment of the feasibility of wound care protocols in Mbandaka (DRC)

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Abstract

Introduction: Wound care remains a major public health challenge in low-resource healthcare systems, where existing protocols are often overlooked or deemed unsuitable. This study assesses the applicability of nursing protocols dedicated to wound care and identifies the factors associated with their non-use in three healthcare facilities in Mbandaka, in the Democratic Republic of the Congo.

Methodology: A descriptive and analytical cross-sectional survey involved 70 healthcare workers practising at the Wangata Regional General Hospital, the Bolenge Regional General Hospital and the Mama Balako Community Health Centre. Data were collected via a self-administered questionnaire. Descriptive analyses, chi-squared tests and binary logistic regression were carried out.

Results: The study population was predominantly female (67.1 per cent) and aged 30–39 years (41.4 per cent). Level A2 nurses accounted for 85.7 per cent of the sample. Only 44.3 per cent of participants applied the protocol regularly.

The most frequently cited barriers were the unavailability of the document (87.2 per cent), a lack of equipment (66.7 per cent) and a lack of training (22.2 per cent). Bivariate analysis revealed significant associations between the protocol', its applicability and the structure of practice ($p < 0.001$), as well as with gender ($p = 0.032$). In logistic regression analysis, the clarity of the protocol ($p = 0.009$; OR = 9.19) and the consideration of practical realities ($p = 0.030$; OR = 5.23) were the most powerful determinants of non-applicability.

Conclusion: The implementation of wound care protocols is inadequate in Mbandaka. Improving their readability, adapting them to the local context and strengthening continuing professional development appear to be priority areas for action.

Keywords: Applicability, care protocol, wounds, nursing, Mbandaka, DRC.

1. Introduction

The global burden of wounds, whether acute or chronic, continues to rise due to an ageing population, the rise in metabolic diseases and an increase in surgical procedures [1,2]. In low- and middle-income countries, this problem is exacerbated by poor infrastructure, a shortage of trained staff and limited access to essential healthcare products [3].

Nursing care protocols are key tools for standardising practices, reducing disparities in care and improving clinical outcomes [4]. However, their mere existence does not guarantee their effective use. The gap between theoretical recommendations and actual practice – the ‘implementation gap’ – remains a persistent barrier, particularly in disadvantaged settings [5].

In the Democratic Republic of the Congo, national protocols have been developed, but their application on the ground remains patchy due to insufficient supervision, limited resources and a frequent mismatch with local realities [6]. The city of Mbandaka, the capital of Équateur Province, illustrates this situation. The main healthcare facilities there receive patients with a variety of wounds on a daily basis, but nurses, who are the primary care providers, struggle to apply the available guidelines.

The aim of this study was to assess the applicability of nursing wound care protocols in three healthcare facilities in Mbandaka and to identify the factors associated with their non-implementation.

2. Methodology

2.1 Type, design and scope of the study

This was a cross-sectional, descriptive and analytical study, conducted from January 2024 to January 2025 at the Wangata General Referral Hospital (HGR), the Bolenge General Referral Hospital (HGR) and the Mama Balako Referral Health Centre (CSR) in Mbandaka.

2.2 Population, sample size and sampling technique

The target population consisted of healthcare professionals directly involved in wound care at these facilities. A non-probability convenience sampling method was used due to the limited size of the accessible population, which totalled 70 participants.

2.3 Inclusion and exclusion criteria

The following were included: any healthcare worker practising at one of the three sites, involved in direct wound care, present at the time of the survey and having given informed consent. The following were excluded: staff on leave, trainees, non-clinical staff and those who refused to participate.

2.4 Data collection tool

A structured, self-administered questionnaire, developed on the basis of the literature [7–9], was used. It comprised four sections: sociodemographic and professional characteristics; knowledge of the protocol; applicability and associated factors; and opinions and suggestions. Content validity was verified by three experts, and a pre-test involving 10 healthcare workers helped to improve the clarity of the items (Cronbach’s $\alpha = 0.78$).

2.5 Variables

- Dependent variable: consistent application of the protocol (yes/no).
- Independent variables: gender, age, educational level, length of service, healthcare setting, training received, existence of the protocol, accessibility, clarity, previous consultation, perceived adaptability, consideration of practical realities, staff receptiveness and difficulties encountered.

2.6 Procedure

Following administrative authorisation and ethical approval from the ISTM/Mbandaka committee, participants were informed individually. Written consent was obtained. The questionnaires were handed out in person, completed independently and returned in a sealed envelope.

2.7 Statistical analyses

The data were entered into Excel and analysed using SPSS 25.0. Descriptive analysis provided frequencies and percentages. Associations were tested using Pearson’s chi-square test (significance level $\alpha = 0.05$). Variables with $p < 0.20$ were included in a binary logistic regression (Enter method). The results are presented as odds ratios (OR) with 95% confidence intervals. The quality of fit was assessed using the Hosmer–Lemeshow test and Nagelkerke’s pseudo- R^2 [10].

2.8 Ethical considerations

The study complied with the principles of the Declaration of Helsinki and the CIOMS guidelines [11]. Anonymity and confidentiality were ensured. Participation was voluntary and withdrawal had no consequences.

3. Results

3.1 Characteristics of the study population

Table 1 presents the distribution of the socio-demographic and occupational characteristics of the 70 nurses surveyed across the three healthcare facilities.

Table 1: Distribution of respondents by facility and socio-professional characteristics

Characteristic	Facility	Sample size (n=70)	%
Structure	Wangata General Hospital	25	35.7
	HGR Bolenge	20	28.6
	CSR Mama Balako	25	35.7
Gender	Male	23	32.9
	Female	47	67.1
Age (years)	20–29	18	25.7
	30–39	29	41.4
	40–49	13	18.6
	≥ 50	10	14.3
Qualification	A2 Nurse	60	85.7
	A1 Nurse	6	8.6

	Nurse A0	2	2.9
	Other	2	2.9
Length of service	< 1 year	9	12.9
	1–5 years	18	25.7
	6–10 years	23	32.9
	10 years and over	20	28.6

Comment:

The sample is predominantly female (67.1 per cent) and comprises 85.7 per cent of A2-level nurses, a profile representative of the local nursing workforce. The age distribution, dominated by the 30–39 age group (41.4 per cent), reflects a relatively young professional population with significant practical experience, as 61.5 per cent have more than six years' service.

3.2 Knowledge and availability of the wound care protocol

This section assesses the integration of reference tools into healthcare professionals' daily practice.

Table 2: Healthcare professionals' knowledge of and access to the wound care protocol

Variable	Response	Sample size (n=70)	%
Specific training received	Yes	27	38.6
	No	43	61.4
Existence of a formal protocol	Yes	36	51.4
	No / Don't know	34	48.6
Protocol available (n=36)	Yes	27	75
	No	9	25
Consultation / Use of the protocol	Yes	33	47.1
	No	37	52.9
Clarity of the protocol deemed satisfactory	Yes	33	47.1
	No	37	52.9

Comment:

The results highlight major shortcomings in the adoption of care tools. Nearly two-thirds of respondents (61.4 per cent) have never received specific training in wound care. Although a formal protocol is theoretically in place in half of the facilities, its actual use and understanding remain limited. The fact that more than half of healthcare staff report never consulting the protocol, or finding it unclear, highlights critical barriers to the standardisation of practices.

3.3 Applicability and difficulties encountered

This section analyses the practical implementation of the protocol and the obstacles identified by healthcare staff.

Table 3: Applicability of the protocol and perceived obstacles

Variable	Response	Sample size (n=70)	%
Regular use	Yes	31	44.3
	No	39	55.7
Favourable conditions met	Yes	13	18.6
	No	45	64.3
	Partially	12	17.1
Difficulties encountered	Yes	63	90
	No	7	10
Main difficulties (n=63)	Lack of equipment	42	66.7
	Lack of training	14	22.2
	Heavy workload	10	15.9
	Lack of team cohesion	4	6.3

Comment:

The rate of regular implementation is limited to 44.3 per cent. This situation is linked to the lack of favourable working conditions, reported by 64.3 per cent of respondents. The prevalence of a lack of equipment (66.7 per cent) amongst the obstacles cited confirms that logistical constraints are the main barrier to adherence to the protocol, making its

implementation difficult, if not impossible, for a large proportion of staff.

3.4 Perceptions of the protocol

This section examines healthcare staff's views on the extent to which the protocol meets the requirements and realities of the departments.

Table 4: Healthcare staff's views on the protocol

Variable	Response	Sample size (n=70)	%
Suitable for the department's context	Yes	24	34.3
	No	33	47.1
	Partially	13	18.6
Takes account of the realities on the ground	Yes	26	37.1
	No	39	55.7
	Don't know	5	7.1
Staff open to using it	Yes	22	31.4
	No	40	57.1
	Not always	8	11.4

Comment:

Analysis of perceptions reveals a disconnect between theoretical tools and clinical needs. A majority of healthcare staff consider the protocol unsuitable for the specific context of their department (47.1 per cent) and not representative of the realities on the ground (55.7 per cent). Furthermore, the low level of acceptance amongst staff (57.1 per cent negative opinions) suggests the existence of a vicious circle in which the feeling that the tools are unsuitable leads to a loss of support from users, thereby permanently undermining adherence to good care practices.

3.5 Bivariate analysis: associations with protocol adherence

This section examines the factors correlated with the implementation of the wound care protocol. The dependent variable 'Protocol implementation' was cross-analysed with socio-demographic and structural variables.

Table 5: Association between healthcare facility type and protocol adherence

Facility	Application Yes (n, %)	Not followed (n, %)	Total	χ^2	ddl	p
HGR Wangata	17 (68.0)	8 (32.0)	25	32.065	2	< 0.001
HGR Bolenge	4 (20.0)	16 (80.0)	20			
CSR Mama Balako	10 (40.0)	15 (60.0)	25			
Total	31 (44.3)	39 (55.7)	70			

Comment:

The association between the healthcare facility and protocol adherence is highly significant ($p < 0.001$). The Wangata General Hospital stands out for having the highest rate of protocol implementation (68.0 per cent), in stark contrast to the Bolenge General Hospital (20.0 per cent). These telling disparities suggest that the institutional context, including local leadership, work organisation and the availability of resources, exerts a decisive influence on healthcare practice.

Table 6: Association between gender and protocol adherence

Gender	Implementation Yes (n, %)	Not applied (n, %)	Total	χ^2	ddl	p
Male	7 (30.4)	16 (69.6)	23	4.598	1	0.032
Female	24 (51.1)	23 (48.9)	47			
Total	31 (44.3)	39 (55.7)	70			

Comment:

A significant association was observed between gender and adherence to the protocol ($p = 0.032$). Female staff had a higher rate of adherence (51.1 per cent) compared with male staff (30.4 per cent). This difference may reflect variations in the approach to professional socialisation or a different propensity to adopt standardised working procedures within the nursing environment.

3.6 Multivariate analysis: determinants of non-compliance

A binary logistic regression was carried out to identify the independent factors associated with **non-adherence** to the protocol. The model allowed for the adjustment of confounding effects and highlighted the most significant barriers.

Table 7: Binary logistic regression – Independent factors associated with non-adherence to the protocol

Explanatory variables	B	E.S.	Wald	ddl	p	OR (Exp B)	95% CI
Gender (Ref. Female)	-1.452	0.946	2.358	1	0.125	0.234	[0.036 – 1.507]
Wound care training	1.312	0.785	2.795	1	0.094	3.716	[0.798 – 17.303]
Protocol clarity (Ref. Clair)	2.218	0.844	6.911	1	0.009	9.187	[1.757 – 48.037]
Difficulties encountered	-18.625	-	0	1	0.999	0	-
Staff responsiveness	0.294	0.739	0.159	1	0.69	1.342	[0.316 – 5.699]
Perceived adaptability	-0.872	0.694	1.581	1	0.208	0.418	[0.108 – 1.625]
On-the-ground realities (Ref. Yes)	1.654	0.76	4.735	1	0.03	5.231	[1.178 – 23.234]

Performance indicators: Hosmer-Lemeshow test: $\chi^2 = 5.823$ ($p = 0.668$); Nagelkerke's pseudo- $R^2 = 0.312$.

Comment:

The multivariate analysis confirms that non-adherence to the protocol is primarily driven by factors related to the design and suitability of the tool:

1. **The clarity of the protocol** appears to be the main predictor: a document deemed unclear increases the risk of non-adherence by a factor of 9.19 (OR = 9.19; $p = 0.009$).
2. **Relevance to real-world practice** is the second key factor: when the protocol fails to take actual working conditions into account, the risk of non-compliance is 5.23 times higher (OR = 5.23; $p = 0.030$).
3. Although the lack of **training** was not statistically significant at the conventional 5 per cent threshold ($p = 0.094$), the high OR (3.72) suggests a non-negligible

influence that would warrant analysis using a larger sample.

The non-significant Hosmer-Lemeshow test ($p = 0.668$) indicates that the model fits the observed data well, explaining approximately 31 per cent of the total variance.

4. Discussion

Our study reveals insufficient adherence to wound care protocols in Mbandaka, with only 44.3 per cent of staff following them regularly. This rate is comparable to that observed in Nigeria by Osemene and Eneku [12] and is consistent with the ‘implementation gap’ described by Grol and Wensing [5].

The predominance of female staff and the relative youth of the workforce are consistent with WHO data for Africa [13]. The significant association between female gender and better adherence (51.1 per cent versus 30.4 per cent) echoes the findings of Ndung’u et al. [14], who attribute this difference to differing professional attitudes.

The lack of training (61.4 per cent have never received any) is a major cause for concern. This is consistent with the findings of Télesphore et al. [15] in the DRC and highlights the urgent need for a structured continuing professional development programme. The fact that this variable was not statistically significant in the multivariate analysis ($p = 0.094$) could be due to a lack of statistical power or to confounding effects with other organisational factors.

Logistical barriers – unavailability of the protocol (87.2 per cent) and a shortage of equipment (66.7 per cent) – are the most frequently cited obstacles. Hulbert-Lemmel et al. [8] have previously identified these barriers as recurring issues in acute wound care. Improving the supply of materials and actively disseminating protocols (via posters, pocket guides and digital versions) are therefore concrete measures that should be prioritised.

The multivariate analysis identifies the clarity of the protocol and its consideration of real-world circumstances as the two most powerful independent determinants of non-adherence. These results confirm the theoretical models of Orangi et al. [7] and Greenhalgh et al. [16], which emphasise simplicity, clinical relevance and contextual adaptation as key drivers of guideline adoption. A protocol perceived as obscure or disconnected from healthcare workers’ day-to-day practice will naturally be rejected. Consequently, co-development with end-users appears to be an essential approach.

Finally, the participants’ suggestions – training (58.6 per cent) and provision of equipment (40.0 per cent) – are consistent with the recommendations in the literature and provide an operational roadmap for managers.

Limitations of the study: the cross-sectional design does not allow for inferring causality; self-reported data are subject to social desirability bias; the small sample size ($n = 70$) limits generalisability; the absence of direct observations of practices constitutes a weakness.

5. Conclusion

This study highlights a worrying lack of adherence to wound care protocols in Mbandaka. The clarity of guidelines and their suitability to the local context are key factors in their effective use. To improve the quality of care, decision-makers and managers must focus on three priority areas:

1. Revise and simplify the protocols with the active involvement of frontline nurses;
2. Ensure access to essential material resources;
3. Introduce compulsory, practical continuing professional development in wound care.

Interventional and multicentre research is needed to assess the impact of these strategies in other Congolese settings.

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