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Prevalence, Activity Limitations and Quality of Life in Patients with Non-Specific Neck Pain in Burundi: A Cross-Sectional Study

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Introduction: Non-specific neck pain (NSNP) causes a great deal of discomfort, impacting a person's functionality and quality of life. This study aimed to determine the prevalence, activity limitations, and quality of life in patients with NSNP in Burundi.

Patients and Methods: This was a cross-sectional study with descriptive and analytical aims, covering the period from September 2023 to February 2024. It focused on NSNP patients received in three health facilities of Bujumbura. In addition to sociodemographic data, clinical data including pain, disability, psychological status and quality of life were collected.

Results: Most of patients (47.1%) were over 40 years old, with an average of 49.30 (13.30) years. The majority was female, married, employed, and had a university education. Most of them (64.70%) described their pain as moderate to severe, with a mean score of 6.20 (1.60) on the numerical scale. A minority had poor health-related quality of life (20.60%). The majority had mild to moderate disability in both the psychological (41.20%) and physical (55.90%) components. Pain location during the current episode had a statistically significant association with social aspects ($p=0.049$). Individuals with lower levels of education, a more sedentary lifestyle, and greater psychological distress are likely to experience increased activity limitations ($p<0.05$).

Conclusion: NSNP is a significant public health concern in Burundi, impacting individuals' socio-professional lives and overall quality of life. Individuals with lower levels of education, a more sedentary lifestyle, and greater psychological distress are likely to experience increased activity limitations. The state of health was perceived as poor by 20.60% of the sample. The physical component of health status was more impaired than the mental component, and the majority of patients presented moderate to severe disabilities, highlighting the need for preventive and management measures to mitigate its impact on individuals and the healthcare system in Burundi.

Keywords: non-specific neck pain, prevalence, activity limitations, quality of life, Burundi

Introduction

According to the World Health Organization (WHO) and Cieza et al, musculoskeletal diseases (MSDs) cause the heaviest social and economic burden that developing countries bear, and therefore they would contribute to the general poor health of the population.[1,2] This is evident in many African countries including Burundi where studies have reported a prevalence of over 80%.[3,4] In Burundi, work related MSDs are still high, which leads to a high prevalence of absentees in various fields of employment, a drop in productivity in certain sectors, and a high prevalence of people going to hospitals for treatment.[4]

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Among MSDs, the prevalence of neck pain (NP) is significant.[3] This condition is a multifactorial, and a major problem of public health in the World.[5] The vast majority of NP is not due to organic pathology, and therefore, has been termed "non-specific neck pain (NSNP).[6] NSNP is usually located in the posterior and lateral part of the neck between the superior nuchal line and the spinous process of the first thoracic vertebra, without signs or symptoms of structural pathology, but with variable interference with the activities of daily living as well as in the absence of neurological signs and specific pathologies such as: traumatic sprain and fracture, tumor, infectious or inflammatory cervical spondylolysis, etc.[7] In a "Biopsychosocial" framework, a number of modifiable and non-modifiable factors could be considered as contributing to NSNP. Non-modifiable factors include factors related to pathoanatomical features (eg history of trauma, age, sex and genetics); and modifiable risk factors are more related to psychosocial characteristics (eg smoking, physical activity and sedentary lifestyle, beliefs, coping style, expectations and job satisfaction).[8] These factors can also cause acute NSNP, that can become chronic.[9] In addition, because of their correlation with neck pain and/or function, beliefs such as fear-avoidance, pain acceptance, self-efficacy, treatment expectations, catastrophizing behaviors, and locus of pain control are factors that need to be investigated in patients with neck pain in order to propose an appropriate treatment.[10]

In recent years, Physical and Rehabilitation Medicine (PRM) practices have been inundated with consultants suffering from musculoskeletal disorders, with low back pain and NSNP being the most prevalent.[11,12] However, NSNP has not been the subject of studies as many international or regional studies as low back pain (LBP). While much of the existing literature highlights the prevalence of NSNP in high-income settings, studies indicate that the burden of this condition is equally impactful in low-resource environments.[13] Furthermore, research in office workers reveals that NSNP can lead to significant reductions in quality of life, especially in terms of physical health, and is linked to increased job-related stress and absenteeism.[13] These findings are especially relevant for Burundi, where socio-professional challenges are compounded by health-related disabilities. By focusing on the quality of life and disability outcomes in NSNP patients, this research contributes valuable insights into how this condition affects both individuals and the broader health system in Burundi. In this country, very few studies have been carried out on the prevalence of NSNP, and none have focused on activity limitations and quality of life in patients with NSNP. It is within this context that the present study was carried out, aiming to determine the prevalence, activity limitations, and quality of life in patients with NSNP in Burundi.

Materials and Methods

Settings

This study took place in the physiotherapy departments of the "Centre National de Référence en Kinésithérapie et Réadaptation médicale (CNRKR)", the "Centre Hospitalo-Universitaire de Kamenge (CHUK)", the "Hôpital Militaire de Kamenge (HMK)", and the "Hôpital Prince Régent Charles (HPRC)". These centers were chosen based on their accessibility and the high volume of NSNP cases they receive, which ensured a sample that reflects the range of patients seeking care for this condition. We selected these centers as they represent common healthcare settings where individuals with NSNP would typically present, providing a more generalized sample of NSNP patients across Burundi. Our study was a prospective cross-sectional study with both descriptive and analytical objectives, covering the period from 1st September 2023 to 29th February 2024. The study focused on patients with NSNP who consulted one of the three health facilities during the study period.

Eligibility Criteria

The study involved all patients received at any of the three study centers who met the inclusion and exclusion criteria below:

Inclusion Criteria

Inclusion criteria were (1) patients ≥18years with NSNP who sought consultation with the centers involved within the study period and (2) gave their consent to participate in the study.

Exclusion Criteria

Patients who never brought the survey, those who partially filled the questionnaires, or those having psychiatric or vision problems were excluded.

Data Collection and Variable Description

Participation in the survey was voluntary and contingent upon clarification of the objectives and procedures of the study. The survey exclusively involved patients who met the inclusion and exclusion criteria. Data were collected through the completion of a survey form and anonymous responses to questionnaires. Most of the data were gathered through patient interviews, although some questionnaires were completed independently by the patients. The data collection form included sections on sociodemographic, clinical and therapeutic data, as well as a series of questionnaires, including a health status questionnaire (MOS SF-36), a questionnaire assessing disability due to pain (INDIC), and another assessing mental health, the Hospital and Anxiety Depression scale (HAD). Each of the questionnaires (MOS SF-36, INDIC, and HAD) was chosen based on their ability to comprehensively assess various aspects of NSNP and its impact on the patients' health and quality of life.

Data Synthesis and Analysis

Data collection was facilitated by the use of the Kobocollect application. Data were collected and processed from the Kobotoolbox server, enabling extraction into Microsoft Excel 2021 and analysis using R-4.4.1 software. The study population was described using standard statistics methods. In fact, qualitative variables were presented as percentages, and quantitative variables as means and standard deviations. The SF-36 scores were compared with the independent variables using an analysis of variance with Student's *T*-test. Next, a crude linear regression model (bivariate) was performed to assess the association between the independent variables and neck pain (measured by the continuous score: INDIC). Finally, an ANOVA was conducted to assess the relationship between the INDIC score and the subscales of the HAD scale.

Ethical Considerations

The steps and precepts of the research were respected as specified in international texts: submission of the research protocol for validation; request for research authorization from the authorities of the CHUK, HMK, HPRC and CNRKR. To this end, the study has been approved by the Burundi's Faculty of Medicine, and agreements to carry out the study have been received from the various centers involved. Written informed consent was obtained from all patients or subjects whose data have been included in the study, in full compliance with the ethical guidelines of the Helsinki Declaration. During this study, patient anonymity was strictly respected, from data collection to publication of results.

Results

Patients' Features

In this study, a total of 1269 patients was counted, including 135 (10.63%) with NSNP. After applying the inclusion and exclusion criteria, 34 participants were retained for assessment. Figure 1 shows the participant selection process. The majority of the sample was female, married, employed, university-educated and over 40 years of age with the mean age of 49.30 (13.30) years. The characteristics of the 34 participants with NSNP are presented in the Table 1. Most of patients (64.70%) described their pain as moderate, with an average of 6.20 (1.60) on the numerical scale. A minority described their state of health as poor (20.60%), with anxiety (23.50%) and depression (14.70%). The majority reported mild to moderate disability for the psychological (41.20%) and physical (55.90%) components of the MOS SF-36. Based on the INDIC scale, most of patients described a moderate level of activity limitation with an average of 39.68 (17.17). Details of these clinical settings are provided in Tables 2 and 3.

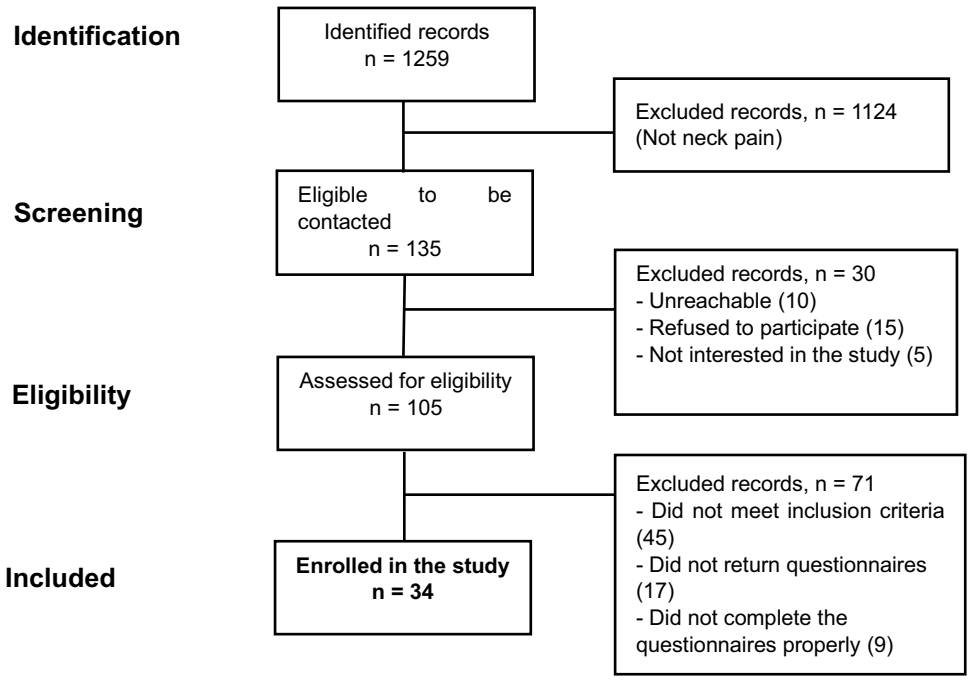

Figure 1 Flowchart of the study.

Factors Influencing the Quality of Life and Activity Limitations

ANOVA analysis showed that pain location during the current episode and the number of physiotherapy sessions were statistically significantly associated with social aspects according to the MOS SF-36 (p=0.049). This means that those who experience pain in certain areas of the neck or have fewer physiotherapy sessions tend to report more limitations in

Table 1 Patients' Features

Variables	n	%	Mean (Sd)
Age	–	–	49.30 (13.30)
Gender			
Male	16	47.10	–
Female	18	52.90	–
Marital status			
Married	28	82.40	–
Single	3	8.80	–
Widowed	3	8.80	–
Education Level			
University	18	52.90	–
Higher cycle	3	8.80	–
Lower cycle	7	20.60	–
Primary	6	17.60	–

(*Continued*)

Table 1 (Continued).

Variables	n	%	Mean (Sd)
Profession			
Official	15	44.10	–
Farmer	6	17.60	–
Retired	5	14.70	–
No profession	4	11.80	–
Military	2	5.90	–
Retailer	1	2.90	–
Housewife	1	2.90	–
Lifestyle			
Physical exercise	24	70.60	–
Alcohol consumption	10	29.40	–
Sedentary lifestyle	4	11.70	–
Pain intensity (Numerical Scale)			6.20 (1.60)
Moderate [4, 6]	22	64.70	–
Severe [7, 8]	11	32.35	–
Very severe [9, 10]	1	2.94	–
Evolution time (Months)			4.1 (2.7)
< 1.5 months	6	17.60	–
1.5 - < 6 months	24	70.60	–
>6 months	4	11.80	–
Ongoing treatment			
Physiotherapy	29	85.30	–
Medical	17	50.00	–
Traditional	2	5.90	–

Abbreviations: <, Less than; >, Greater than; %, percentage; n, number; Sd, Standard deviation.

Table 2 Health-Related Quality of Life of the Sample Size According to the MOS SF-36 and Limitation Activity According to the INDIC

Variable	n	%	Mean (Sd)
Patient's general perception of health according to the MOS SF-36			
Good	24	70.60	–
Mediocre	7	20.60	–
Very good	3	8.80	–

(*Continued*)

Table 2 (Continued).

Variable	n	%	Mean (Sd)
Quality of life score in the 8 health dimensions according to the MOS SF-36			
PF	–	–	63.38 (17.78)
RP	–	–	24.26 (39.16)
BP	–	–	37.05 (12.68)
GH	–	–	45.88 (11.70)
VT	–	–	56.17 (9.45)
SF	–	–	55.88 (17.47)
RE	–	–	24.50 (40.45)
MH	–	–	63.38 (9.64)
PCS			
< 30: Severe disability	5	14.70	–
[30;40]: Moderate disability	19	55.90	–
[40;50]: Mild disability	8	23.50	–
≥ 50: Normal	2	5.90	–
MCS			
< 30: Severe disability	1	2.90	–
[30;40]: Moderate disability	14	41.20	–
[40;50]: Mild disability	17	50.00	–
≥ 50: Normal	2	5.90	–
Activity limitation according to the INDIC			
Cervical Pain and Disability Index			39.68 (17.17)

Abbreviations: <, Less than; >, Greater than; ≥, Greater than or equal to; %, percentage; n, number; Sd, Standard deviation; QoL, Quality of Life; PF, Physical Functioning; RP, Role Physical; BP, Bodily Pain; GH, General Health; VT, Vitality; SF, Social Functioning; RE, Role Emotional; MH, Mental Health; MCS, Mental Composite Score; PCS, Physical Composite Score; MOS-SF-36, Medical Outcome Study Short Form-36; INDIC, "Indice de Douleur et d'Incapacité Cervicale".

Table 3 Psychological State of Study Patients According to the HAD Scale

Variable	n	%
Anxiety		
≤ 7: absence of symptoms	15	44.10
8 to 10: dubious symptomatology	11	32.40
≥ 11: certain symptomatology	8	23.50

(*Continued*)

Table 3 (Continued).

Variable	n	%
Depression		
≤ 7: absence of symptoms	16	47.10
8 to 10: dubious symptomatology	13	38.20
≥ 11: certain symptomatology	5	14.70

Abbreviations: <, Less than; ≤, Less than or equal to; >, Greater than; ≥, Greater than or equal to; %, percentage; n, number.

their social interactions and activities. No other variable showed a statistically significant association with SF-36 domains. Linear regression analysis revealed several statistically significant associations. Individuals with university education or higher had an INDIC score of 19 points lower than those with primary education or uneducated (p=0.024). Non-working individuals had an INDIC score 16 points lower than working individuals (p=0.022). Anxiety was positively associated with the INDIC score, with an increase of 3.2 points for each unit increase in anxiety (p=0.009). This means that individuals who report higher levels of anxiety or have lower levels of education tend to experience more challenges in their social life due to NSNP. No other variable was significantly associated with the INDIC score in this model. Details are provided in Tables 4 and 5.

Table 4 Factors Influencing Quality of Life

Variable\QoL Components/P-value	PF	RP	BP	GH	VT	SF	RE	MH
Sex	0.3	0.4	0.9	>0.9	0.4	0.7	0.4	0.6
Age range	0.6	0.5	0.5	0.8	0.4	0.4	0.4	0.9
Level of study	03	0.7	>0.9	0.4	0.3	>0.9	0.6	0.2
Marital status	0.5	0.8	0.8	0.4	>0.9	0.4	0.3	0.5
Number of children	0.3	0.3	0.094	0.5	0.8	0.5	0.7	0.4
Sedentary lifestyle	0.4	>0.9	0.5	0.4	0.2	> 0.9	0.7	0.3
Practical exercise lifestyle	0.4	0.7	0.7	0.13	0.7	0.3	0.4	0.3
Alcoholism lifestyle	0.3	0.8	0.3	0.6	0.3	0.4	0.080	0.14
Location of pain (current episode)	0.14	0.064	0.4	0.3	>0.9	**0.049**	0.067	>0.9
Pain evolution times	0.7	0.5	0.7	>0.9	0.2	0.3	0.3	0.5
Intensity of pain	0.7	0.3	0.3	0.4	>0.9	0.8	0.6	0.2
Number of physiotherapy sessions	0.14	0.4	0.2	0.14	0.6	**0.006**	0.5	0.5

Notes: Bold values represent statistically significant p-values (**p < 0.05**). Specifically, **p = 0.049** indicates significance at the 5% level, while **p = 0.006** shows high significance at the 1% level.
Abbreviations: >, Greater than; QoL, Quality of Life; PF, Physical Functioning; RP, Role Physical; BP, Bodily Pain; GH, General Health; VT, Vitality; SF, Social Functioning; RE, Role Emotional; MH, Mental Health.

Table 5 Factors Influencing Activity Limitations

Features	Beta	95% CI	P-value
Age range			
< 50 years	–	–	
≥ 50 years	4.5	[−7.1; 16]	0.4
Sex			
Men	–	–	
Women	−4.0	[−16; 8.2]	0.5
Education Level			
Primary/ Lower cycle	–	–	
University/Higher education	−19	[−35; −2.6]	**0.024**
Marital status			
Married	–	–	
Single without children / Widowed	−12	[−30; 5.7]	0.2
Profession			
Actif	–	–	
Non Actif	−16	[−29; −2.5]	**0.022**
Number of dependant children			
[0–2]	–	–	
> 2	−7.7	[−19; 4.0]	0.2
Practical exercise lifestyle			
Yes	–	–	
Non	−3.0	[−16; 9.9]	0.6
Previous episode of neck pain			
Non	–	–	
Yes	6.9	[−6.9; 21]	0.3
Psychological condition			
Anxiety	3.2	[0.89; 5.5]	**0.009**
Depression	−0.77	[−3.6; 2.1]	0.6

Notes: Bold values represent statistically significant p-values (**p < 0.05**). Specifically, **p = 0.024** and p = 0.022 indicate significance at the 5% level, while **p = 0.009** shows high significance at the 1% level.
Abbreviations: <, Less than; >, Greater than; ≥, Greater than or equal to; CI, Confidence Interval.

Discussion

Patients' Features

Socio-Demographical Data

A prevalence of 10.63% for NSPN was found in this study. These results align with the literature, which states that the prevalence of neck pain in the general population ranges from 1.7% to 11.5%.[14] Our findings on the prevalence of NSNP

contribute foundational data for understanding the burden of this condition in Burundi. The patients in the study sample were predominantly women, married, aged over forty (40 to 60). Previous studies have found similar or comparable results.[15,16] This age group includes the working population, which is subject to multiple risk factors, including manual, occupational stress, and poor posture at work. Additionally, the gradual onset of osteoarthritis is a major factor in the development of the disease, which may account for the age of the patients in the study sample. Moreover, women are more prone to various mechanical stresses on their spine during professional and daily activities, in addition to being sensitive to psychosocial factors, hence their high proportion in the sample.

More than half of the study sample had a university education level, with a proportion of 52.9%. Our results contrast with those of Fernandez et al, in Spain, who found a low prevalence of 15.2% for higher education and those of Rezai et al, in Canada, who found a high proportion for secondary education (56.6%).[11,17] This difference could be explained by the fact that this study took place in specialized practices in urban areas, where many patients with a university education seek quality care.

In this study, most of patients (88.20%) were active and employed as civil servants, and some consumed alcohol. The majority had office jobs involving the maintenance of prolonged static positions, which has been shown to be a factor favoring musculoskeletal disorders including neck pain.[18,19] The difference in alcohol consumption is explained by the fact that in the Muslim countries where other studies were conducted, the consumption of alcohol is prohibited.

Clinical Data

In this study, the majority of patients (79.4%) reported having episodes of neck pain, with at least moderate pain intensity ($\geq$ 4/10) in all patients and a duration of more than six months. This condition was associated with other spinal pains. These results are comparable to those of other authors from different continents.[15] This may be linked to the chronicity of the condition and/or difficulties in accessing healthcare in the African context, which forces patients to delay seeking treatment. In Burundi, geographical and financial issues, and health literacy are the main barriers to healthcare, and exacerbate this condition, leading patients to delay addressing health problems at an early stage.

Health-Related Quality of Life

In this study, quality of life scores below reference standards were found. However, there were better scores in the dimensions of "vitality (VT)" and "mental health (MH)" and poorer scores in the dimensions of "physical functioning (PF)", limitations related to physical state, "Role physical" (RP)", and limitations related to psychological state, "Role Emotional (RE)" than in other components. These results are comparable to those of Daffner et al, in Philadelphia, who found significant and therefore poor score for RP in patients under 40 years and those aged from 40 to 59 years. They also reported that PF was significantly poorer in patients with acute or sub-acute symptomatology.[15]

In this study, the physical component was more impaired than the mental component. These results are comparable to those of Abdu et al, in the USA, and Rezai et al, in Canada, who also found that the physical component (PCS) was more impaired than the average of general population.[17,20] Overall, the health status was perceived as poor by a minority of patients (20.6%). This can be explained by the fact that quality of life depends on pain intensity, and in this study, only a minority reported very severe pain intensity. This corroborate with the results of Gueddari et al who suggested that the functional disability in patients with neck pain is associated with high intensity of pain and disability which affect their quality of life.[21] Furthermore, some patients had already taken medication or had physiotherapy sessions, which could justify their state of health at the time of the assessment. The findings reveal that factors such as education level, employment status, and psychological health play critical roles in influencing the QoL. This emphasizes the need for a comprehensive understanding of the biopsychosocial factors contributing to NSNP-related disability and QoL. Our findings align with and expand upon existing literature on MSDs and non-NSNP. For instance, Hoy et al highlighted the global burden of MSDs, particularly in low-resource settings, emphasizing their substantial impact on health and productivity.[22] Similarly, Paksaichol et al examined the biopsychosocial factors contributing to NSNP, highlighting how psychological distress, social influences, and environmental factors interplay in the development of NSNP.[23]

Functional Disability

In this study, the majority of patients described moderate functional disability, with a significant association between anxiety scores and neck pain levels (p=0.009), specifically, anxiety increased with neck pain severity. Although depression scores also increased with neck pain severity, this association was not statistically significant (p=0.06). These results are similar to those of Blozik et al, in Germany, who found a significant association between anxiety and neck pain determinants, but differed regarding depression.[24] This difference could be explained by the fact that the majority of the Burundian population is religious. In fact, some authors claim that health and religion are linked, asserting that religion contributes to the psychological well-being and improved health of the faithful.[25] The findings revealed that psychological health play critical roles in influencing the extent of activity limitations. This emphasizes the need for a comprehensive understanding of the biopsychosocial factors contributing to NSNP-related disability.

Study Strength and Limitations

This study is the first to determine the prevalence of NSNP in the general population in Burundi. However, some factors associated with quality of life in NSNP patients reported in other studies have not been investigated. These factors could be significantly associated with quality of life in the context of Burundi. These include patient perception of illness, catastrophizing, coping strategies, work absenteeism, and isolation. In addition, the limited sample size in this study restricts its representativeness of the broader Burundian population, reducing the generalizability of the findings. Future research should focus on larger-scale, longitudinal studies to capture more comprehensive data over time. Comparative investigations are also necessary to evaluate the specific benefits of functional rehabilitation and multidisciplinary management for NSNP patients, particularly in low-resource settings like Burundi. However, such studies often face ethical and logistical challenges. Expanding the sample size and integrating culturally sensitive, community-focused approaches would provide deeper insights and actionable outcomes.

Conclusion

This study investigated how people with NSNP experience their disease by assessing pain, activity limitation, and quality of life. The study shows that NSNP is a significant public health concern in Burundi, impacting individuals' socio-professional lives and overall quality of life. Individuals with lower levels of education, a more sedentary lifestyle, and greater psychological distress are likely to experience increased activity limitations. The state of health was perceived as poor by 20.60% of the sample. Patients with NSNP report quality of life scores below reference standards, with the physical component of health status being more impaired than the mental component, and the majority of patients presenting moderate to severe disabilities, highlighting the need for preventive and management measures to mitigate its impact on individuals and the healthcare system in Burundi. A call-to action is addressed to healthcare professionals and policymakers to establish a context-adapted protocol to successfully manage NSNP.

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Disclosure

The authors report no conflicts of interest in this work.

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