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Knowledge of Upright Birth Position Among Nurses and Midwives

- Cervical cancer in South Sudan
- Prognostic factors among oncology patients
- Pneumococcal vaccine for under fives with pneumonia
- Self-medication and associated factors
- Non-communicable diseases among adolescents
- Post-stroke epilepsy in Oman
- Improvement of haemoglobin levels with catfish floss
- And more . . .

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FRONT COVER IMAGE: Upright birth positions (Credit: Evie Rose Fairclough and Robin Conlan)

BACKCOVER:: Notice: Learning about Global Health?

The path forward for cervical cancer in South Sudan

GUEST EDITOR

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January was Cervical Cancer Awareness Month, a critical moment to reflect on the state of cervical cancer prevention and care. In South Sudan, awareness of the disease is slowly growing, but it remains uneven and largely concentrated in urban areas, leaving many women and girls beyond the reach of lifesaving information and services.

Virtually all cervical cancer cases (over 99%) are linked to infection with high-risk types of human papillomavirus (HPV). The most important thing to know is that cervical cancer is one of the most preventable cancers. It develops slowly over many years, providing a crucial window of opportunity to detect and treat pre-cancerous changes before they turn into cancer.

Significant gaps continue to undermine progress. HPV vaccination has not yet been integrated into the country's routine immunization schedule. Screening options such as visual inspection with acetic acid (VIA) and Pap smears are limited in availability and largely confined to a small number of health facilities. Compounding these challenges is South Sudan's inadequate pathology and oncology capacity, which results in many women being diagnosed at advanced stages of the disease, when treatment is more complex, expensive, and often out of reach.

To reverse this trend, South Sudan must adopt a comprehensive, phased strategy aligned with the World Health Organization's 90–70–90 cervical cancer elimination targets, ensuring high HPV vaccination coverage, expanded screening, and timely access to treatment.[1]

Priority actions should include introducing HPV vaccination into routine adolescent immunization programmes, with schools and community platforms, particularly faith-based and local leadership structures, playing a central role in reaching girls and sustaining community trust. At the same time, screening services must be expanded by training more healthcare providers in VIA and cryotherapy and integrating these services into primary health care and maternal health platforms.

Ultimately, progress will depend on strong political leadership and sustained financial investment. We are encouraged by positive steps such as the establishment of the Oncology Department within the Ministry of Health. This is a crucial step in the right direction. Without these, cervical and other cancers will continue to claim lives that could otherwise be saved.

With them, South Sudan can take decisive steps toward protecting women's health and moving closer to the elimination of cervical cancer.

Reference:

1. World Health Organization. Cervical Cancer Elimination Initiative. WHO. 2026. Geneva. https://www.who.int/initiatives/cervical-cancer-elimination-initiative

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Prognostic factors and survival outcomes among oncology patients with known and unknown HIV status in Kisumu County, Kenya

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ABSTRACT

Introduction: Human immunodeficiency virus (HIV) and cancer have a complicated interplay in their pathobiology, resulting in malignancies associated with viral infection. This study sought to establish the prognostic factors and survival outcomes among patients diagnosed with cancer with known and unknown HIV status.

Methods: The study employed a hybrid design, combining retrospective and prospective cohorts from 2019 to 2021. Three hundred and seventy-nine cancer patients with known and unknown HIV status enrolled at the oncology clinic in Kisumu County were recruited via multi-stage and stratified sampling.

Results: The mean age was 57.2 years (SD 15.2). The study population comprised 31.1% (118) males and 68.9% (261) females. Among the study participants, 53.6% (203) were HIV-negative, 39.8% (151) were HIV-positive, and 6.6% (25) had an unknown HIV status. Multivariable Cox regression showed HIV status had no statistical impact on survival. Metastasis at diagnosis increased the risk of death (HR 3.1, p<0.001, 95% CI 1.7-5.6) as did late cancer stage (HR 3.1, p=0.035, 95% CI 1.1–8.7). Longer duration of care reduced risk of death (HR 0.8, p<0.001, 95% CI 0.7-0.9), as did non-tobacco usage (HR 0.3, p=0.042, 95% CI 0.1-0.9).

Conclusion: Tumour stage, metastasis, tobacco use, and duration of care had a statistically significant influence on the survival of the oncology patients.

Keywords: HIV status, cancer survival, prognostic factors, tumour stage, cancer patients, Kenya

Introduction

The global cancer burden, based on the Global Cancer Observatory (GLOBOCAN) (2020) estimates of cancer incidence and mortality from the International Agency for Research on Cancer, revealed approximately 19.3 million new cancer cases (18.1 million excluding non-melanoma skin cancer) and nearly 10.0 million cancer-related deaths (9.9 million excluding non-melanoma skin cancer) in 2020.[1]

In the United States (US), from 1991 to 2021, cancer mortality has been on the decline due to early detection, reduced smoking practices, and advanced treatment, preventing over 4 million deaths.[2] In the first year of cancer diagnosis, age, cancer type and stage, presence of comorbidities, and treatment type significantly influence the cancer-patient survival rates.[3] The key indicator that is used to assess the effectiveness of anticancer treatments is the overall survival of cancer patients from initiation of therapies to death from any cause.[4] Advancements in the treatment of human immunodeficiency virus (HIV) have led to an extended lifespan by reducing acquired immunodeficiency syndrome (AIDS) related deaths and decreasing the incidence of AIDS-defining cancers. However, with the increase in survival time, there has been an increase in non-AIDS-defining cancers among persons with HIV.[5,6] People living with HIV who have malignancies, even though their viral load is suppressed by effective antiretroviral therapy, require more personalised care.[7] Multiple factors influence the intricate relationship between cancer and HIV, making them more complex to treat compared to cancer patients without HIV.[8]

This study aimed to determine the prognostic factors that affect the survival outcomes among cancer patients based on their HIV status. By examining these factors, the study sought to provide evidence to guide treatment decisions, highlight areas for better healthcare integration, and improve survival outcomes for oncology patients in this context.

Method

This was a hybrid retrospective and prospective cohort study conducted from 2019 to 2021 at the Oncology Clinic of Jaramogi Oginga Odinga Teaching and Referral Hospital (JOOTRH) in Kisumu County, Kenya, a referral hospital for patients across the western region of Kenya. In this study, a multi-stage sampling method was employed, where in the first stage, JOOTRH was purposively selected because it serves as the regional referral oncology centre for the western part of Kenya. In the second stage, the study listed all adult cancer patients at Oncology Clinic between 2019 and 2021. In the third stage, all eligible participants with complete medical records were recruited into the study through random sampling.

Participants and materials

Medical records and in-depth interviews were used to collect data from diagnosed cancer patients aged 18 years and above. The retrospective component involved all oncology patients who were already receiving care from 2019 onwards, who had complete medical records from 2019 to 2021. The prospective component involved follow-up of newly diagnosed patients receiving oncology care during the study period from 2019 to 2021. Patients were randomly selected using a random number table with a view of minimizing selection bias. The selection process did not stratify oncology patients by HIV status; instead, the HIV status was documented alongside other clinical information and considered during the analysis.

Data collection

The cancer patients were stratified in the analysis based on their HIV status as HIV positive, HIV negative and unknown status as recorded at the time of their initial contact with the oncology clinic. Collected data included demographic information, cancer diagnosis, HIV status, treatment history, and follow-up outcomes (survival, relapse, treatment response, lost to follow-up). Data were extracted from the hospital's Health Information Management System. The cancer registry and special reports were used for verification and to supplement patient data. The study used both telephone and face-to-face interviews to get information from the participants, depending on their availability and accessibility. Contact information of the patients was obtained from the hospital files. Through telephone interviews, the study was able to gather information on the patients' current health status, including whether they were alive or deceased, ongoing treatment and other relevant health outcomes. Face-to-face interviews were conducted with patients who continued to visit the hospital for their scheduled treatment follow-ups or when they presented with illness.

Statistical analysis

Descriptive statistics, the chi-square test, a Kaplan-Meier plot, multivariable logistic regression, and Cox proportional hazards regression model were used. Analyses were conducted using Stata version 15.1 (StataCorp LLC, College Station, TX, USA).

Results

A total of 379 participants were included. Of these, 151 (39.8%) were HIV negative, 203 (53.6%) HIV positive and 25 (6.6%) had unknown HIV status. The mean age varied significantly (Kruskal-Wallis test $p < 0.001$) across the HIV status groups, with an overall mean age of 57.2 years (SD 15.2). Marital status, alcohol and tobacco use did not differ significantly ($p > 0.05$) across the groups,

Table 1. Characteristics of the study participants

		HIV status			Total	p-value
		Negative n (%)	Positive n (%)	Unknown n (%)		
Ages (Years)	Mean (SD)	50.3 (11.5)	62.5 (15.2)	56.4 (18.1)		
	Median (IQR)	49.7 (41.3,56.2)	64.3 (50.7,74.7)	52.7 (42.5,70.0)	55.9 (45.7,70.0)	<0.001
	Min, Max	26.3, 85.7	24.6, 95.7	28.0, 89.7	24.6, 95.7	
Marital status	Single*	47 (31.1)	52 (25.6)	10 (40.0)	109 (28.8)	0.231
	Married	104 (68.9)	151 (74.4)	15 (60.0)	270 (71.2)	
Sex	Female	120 (79.5)	122 (60.1)	19 (76.0)	261 (68.9)	<0.001
	Male	31 (20.5)	81 (39.9)	6 (24.0)	118 (31.1)	
Cancer stage	1	11 (7.3)	9 (4.4)	2 (8.0)	22 (5.8)	
	2	18 (11.9)	50 (24.6)	1 (4.0)	71 (18.7)	
	3	69 (45.7)	74 (36.5)	6 (24.0)	149 (39.3)	<0.001
	4	31 (20.5)	62 (30.5)	6 (24.0)	99 (26.1)	
	Not recorded	22 (14.6)	8 (3.9)	10 (40.0)	40 (10.6)	
Tobacco use	Current/Previous	9 (6.0)	14 (6.9)	3 (12.0)	26 (6.9)	
	Never	141 (93.4)	185 (91.1)	22 (88.0)	348 (91.8)	
	Not recorded	1 (0.7)	4 (2.0)	0	5 (1.3)	0.608
Alcohol use	No	138 (91.4)	175 (86.2)	22 (88.0)	335 (88.4)	
	Yes	13 (8.6)	25 (12.3)	3 (12.0)	41 (10.8)	
	Not recorded	0	3 (1.5)	0 (0)	3 (0.8)	0.406
Family history of cancer	No	141 (93.4)	180 (88.7)	18 (72.0)	339 (89.4)	
	Yes	4 (2.6)	11 (5.4)	0	15 (4.0)	
	Unknown	5 (3.3)	9 (4.4)	7 (28.0)	21 (5.5)	
	Not recorded	1 (0.7)	3 (1.5)	0	4 (1.1)	<0.001
Duration since Cancer Diagnosis	N	149	202	20	375	
	Mean (SD)	3.2 (1.5)	3.4 (1.6)	3.5 (1.7)	3.3 (1.6)	
	Median (IQR)	3.0 (1.9, 4.1)	3.1 (2.2, 4.9)	3.5 (1.7, 4.7)	3.1 (2.0, 4.6)	0.566
	Min, Max	0.2, 6.7	0.2, 6.7	1.2, 6.4	0.2, 6.7	
	Missing data	2	1	5	8	
Total		**151 (39.8)**	**203 (53.6)**	**25 (6.6)**	**379 (100)**	

* Single / Divorced /Widowed

Table 2. Regression Analysis of clinical characteristics as predictors of death/LTFU

Variable	Univariable OR (95% CI)	p-value	Multivariable OR (95% CI)	p-value
HIV status				
Negative	Ref			
Positive	1.2 (0.8-1.8)	0.278		
Unknown	2.1 (0.8-5.3)	0.121		
Duration (months) since Cancer Diagnosis	0.8 (0.7 - 0.9)	0.024	0.8 (0.7 - 1.0)	0.127
Tumour Stage				
Stage 0-2	Ref		Ref	
Stage 3-4	3.2 (1.8 - 5.5)	<0.001	2.0 (0.8 - 5.5)	0.157
Metastasis at Diagnosis				
No	Ref		Ref	
Yes	3.1 (1.9 - 5.1)	<0.001	2.6 (1.3 - 5.2)	0.006
Age (years) at Cancer Diagnosis	1.0 (0.9 - 1.0)	0.691		
Duration of Symptoms				
0 to 3 months	Ref			
>3 to 6 months	0.6 (0.3 - 1.1)	0.378		
>6 to 12 months	0.8 (0.4 - 1.4)	0.389		
>12 months	0.8 (0.5 - 1.5)	0.412		
Treatment Goal				
Curative	Ref		Ref	
Palliative	2.5 (1.4 - 4.2)	0.001	1.6 (0.6 - 4.0)	0.317
Consistent with Treatment/Adherent				
No	Ref		Ref	
Yes	0.2 (0.1 - 0.4)	<0.001	0.2 (0.1 - 0.5)	<0.001
Reported Treatment Complications				
No	Ref			
Yes	1.3 (0.6 - 2.5)	0.497		
Duration on Care (months)	0.9 (0.9 - 1.0)	<0.001		
Tobacco Use				
Current/Previous use	Ref		Ref	
Never	0.4 (0.2 - 1.0)	0.055	0.9 (0.1 - 5.8)	0.944
Alcohol Use				
No	Ref		Ref	
Yes	1.9 (0.9 - 3.6)	0.055	3.2 (0.7 - 13.5)	0.117

Table 3. Cox proportional hazard regression of clinical characteristics as predictors of death/LTFU

Variable	Univariable HR (95% CI)	p-value	Multivariable HR (95% CI)	p-value
HIV status				
Negative	Ref		Ref	
Positive	1.4 (1.0-2.0)	0.054	1.0 (0.6-1.8)	0.978
Unknown	1.8 (1.0-3.3)	0.598	1.1 (0.3-3.6)	0.914
Duration (months) since Cancer Diagnosis	0.8 (0.7–0.9)	<0.001	1.0 (0.8–1.2)	0.797
Tumour Stage				
Stage 0-2	Ref		Ref	
Stage 3-4	2.4 (1.5–3.9)	<0.001	3.1 (1.1–8.7)	0.035
Metastasis at Diagnosis				
No	Ref		Ref	
Yes	1.8 (1.3–2.6)	0.001	3.1 (1.7–5.6)	<0.001
Age (years) at Cancer Diagnosis	1.0 (0.9–1.0)	0.299		
Duration of Symptoms				
0 to 3 months	Ref		Ref	
>3 to 6 months	0.6 (0.4–1.0)	0.133	0.9 (0.4–1.9)	0.789
>6 to 12 months	0.6 (0.4–0.9)	0.029	1.1 (0.6–2.1)	0.821
>12 months	0.8 (0.5–1.2)	0.430	0.6 (0.3–1.3)	0.421
Treatment Goal				
Curative	Ref		Ref	
Palliative	1.9 (1.2–3.0)	0.006	0.5 (0.2–1.3)	0.178
Consistent with Treatment/Adherent				
No	Ref		Ref	
Yes	0.4 (0.3–0.6)	<0.001	0.6 (0.4–1.1)	0.078
Reported Treatment Complications				
No	Ref			
Yes	1.2 (0.7–2.0)	0.557		
Duration on Care (months)	0.9 (0.8–0.9)	<0.001	0.8 (0.7–0.9)	<0.001
Tobacco Use				
Current/Previous use	Ref		Ref	
Never	0.5 (0.3–0.8)	0.007	0.3 (0.1–0.9)	0.042
Alcohol Use				
No	Ref		Ref	
Yes	2.0 (1.2–3.1)	0.004	0.6 (0.2–1.6)	0.289

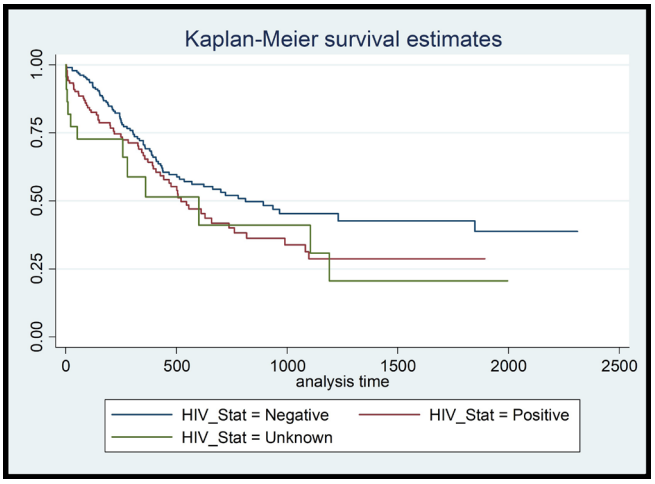

Figure 1. Kaplan-Meier survival estimates by HIV status

whereas sex, family history of cancer and cancer stage at diagnosis showed statistically significant differences (p<0.001), as shown in Table 1.

HIV status was considered a primary variable of interest due to its known influence on cancer outcome. The survival status of the oncology patients was classified as alive, dead or lost to follow-up (LTFU). HIV status was explicitly included as a covariate in the logistic regression to assess its association with the disease status outcomes.

Table 2 presents the results of a logistic regression analysis using death or loss to follow-up (LTFU) as the outcome measure. In the univariable analysis, significant predictors of death or LTFU were short duration since diagnosis, late tumour stage, metastasis at diagnosis, palliative treatment goal, non-adherence to treatment, and shorter duration of care. Although HIV was a key variable of interest, it was not a statistically significant predictor of death or LTFU. Multivariable analysis was performed using the variables that were significant in the univariable analysis, excluding time-related variables that were considered co-linear. In this analysis, only metastasis at diagnosis (OR 2.6, 95% CI 1.3-5.2, p=0.006) and non-adherence to treatment (OR 0.2, 95% CI 0.1-0.5, p<0.001) were significant predictors of death or LTFU.

Using data from patients with reliable time-to-event information, Kaplan-Meier survival estimates were plotted (Figure 1) and a Cox proportional hazard regression was performed (Table 3). The Cox regression allowed the study to estimate the hazard ratio for mortality over time, complementing the logistic regression findings.

A Kaplan-Meier curve (Figure 1) was used to assess the survival probability according to HIV status (negative, positive, and unknown). An unadjusted log-rank test, comparing the survival distributions of the three HIV groups, revealed a significant difference (p= 0.047). The HIV negative group had fewer observed deaths than expected (75 observed vs 88.8 expected), suggesting a better-than-expected survival, whereas the HIV positive group had more observed deaths than expected (61 observed vs 51.4 expected), suggesting that HIV status might have played a meaningful role in predicting survival outcomes among oncology patients.

While the unadjusted Kaplan-Meier analysis showed a statistically significant difference in the survival outcome by HIV status, this finding was not supported in the Cox regression analysis (below), suggesting that HIV status alone was not an independent predictor of survival.

Table 3 shows the results of Cox proportional hazards regressions. In the univariable analysis, significant predictors of death or loss to follow-up were: a shorter duration since cancer diagnosis, later tumour stage, metastasis at diagnosis, palliative treatment goal, non-adherence to treatment, shorter duration on care, tobacco use and alcohol use. However, in the multivariable analysis, only tumour stage (HR 3.1, 95% CI 1.1-8.7, p=0.035) metastasis at diagnosis (HR 3.1, 95% CI 1.7-5.6, p<0.001), short duration of care (HR 0.8, 95% CI 0.7-0.9, p<0.001) and past or current tobacco use (HR 0.3, 95% CI 0.1-0.9, p=0.042) remained significant predictors of death/LTFU.

Discussion

The Cox regression showed that HIV status did not statistically influence survival. This suggests that HIV status alone might not be a strong determinant of survival in this cohort. Findings of this current study were consistent with Atwine et al[6] who observed that, although people with human immunodeficiency virus (PWH) had higher mortality rates than those without HIV, the differences in overall survival and cancer-specific survival were not statistically significant, indicating no notable survival disparities between the two groups in the era of modern treatment. The results of this study agree with a study done among PWH in Japan,[9] which also concluded that HIV status did not significantly influence survival among patients with non-AIDS-defining malignancies. Additionally, a prognostic study done among women with cervical cancer in Thailand also found that HIV status did not significantly influence long-term survival.[10] The

results of the current study, however, differ from those of the 2023 US Cancer database, which reported poorer survival outcomes in HIV-positive individuals, especially when cancer was diagnosed at later stages.[11]

These results emphasise the importance of early-stage detection and metastasis management in improving cancer patients' survival outcomes. However, when tumour stage was included in the multivariable model, an interesting shift emerged: although tumour stage was significant in the univariable analysis, it lost significance after accounting for other factors in the multivariable analysis. The loss of statistical significance may be due to a complex interplay between the cancer stage and other prognostic factors.

The current study observed that cancer patients who used tobacco had a poorer survival rate compared to non-smokers. This result is consistent with the existing literature that pointed out that tobacco use is a significant risk factor that enables cancer development and results in adverse outcomes among such patients. As noted in the previous studies, lung cancer has been linked to tobacco smoking and increased cancer-related deaths globally.[12, 13] While in this study, we did not specifically analyse the cancer types in relation to the tobacco usage, the analysis showed that poor survival among tobacco users supports the continued need for cessation of tobacco use as an intervention among oncology patients. Among patients with lung cancer, tobacco smoking remains the leading causative agent and was estimated to be 67% of lung cancer deaths globally in 2019.[14]

Conclusion

The study observed that tumour stage, metastasis, tobacco use and duration of care had a statistically significant influence on the survival of the oncology patients.

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Author contributions

RND and GKM conceptualized and designed the study. RND, GKM, and GA oversaw data collection. RND and Dr. Benard Samba conducted the statistical analysis and interpretation. RND, GKM, and GA contributed to writing the manuscript. RND and GKM were primarily responsible for the final content. All authors have reviewed and approved the final manuscript.

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Data availability

The data presented in this manuscript will be made accessible upon request to the corresponding author.

Ethics approval and consent to participate

All procedures involving human participants were conducted in accordance with the ethical guidelines set by the institutional and/or national research committees, as well as the 1964 Helsinki Declaration and its subsequent ethical standards. Ethical approval for the study was granted by the JOOTRH Institutional Ethical Review Committee (ISERC/JOOTRH/708/23), and permission to access patient medical records was provided by the hospital administration. Additionally, the research received authorization from the National Commission for Science, Technology, and Innovation, which issued the research license (License No: NACOSTI/P/23/29542).

Competing interests: None.

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IFE Core Group Cholera FAQs

In the first half of 2025, cholera epidemics spread to over 25 countries, primarily in Africa, and South Asia. There have been over 200,000 cases and approximately 3,000 deaths.

The Infant Feeding in Emergencies Core Group has developed these Frequently Asked Questions (FAQs) based on the most up-to-date evidence. The FAQs aim to help mothers and health workers to breastfeed infants safely during a cholera outbreak.
See https://www.ennonline.net/resource/ife/ife-core-group-cholera-faqs

Also available in Arabic.

Knowledge, attitude, and practice of the upright birth position among nurses and midwives in Dar es Salaam, Tanzania

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ABSTRACT

Introduction: The World Health Organisation recommends that all women in labour should give birth in the position of their choice. This study aimed to assess the knowledge, attitudes, and practices regarding the upright birth position among nurses and midwives working in the Maternity Department in Dar es Salaam, Tanzania.

Method: This was a hospital-based, analytical, cross-sectional study design using a quantitative approach and a self-administered, structured questionnaire. Descriptive statistics were used to analyse the frequency distribution of the variables. Binary and multivariate logistic regressions were applied to determine the strength of the association between independent and dependent variables.

Results: Out of 283 participants, only 38 (13.4%) had ever practised upright birth positions at least once, 33 (11.7%) had good knowledge, though 220 (78.1%) had a positive attitude toward upright birth positions.

Conclusion: Supporting midwives in delivering in the upright position is necessary to increase the number of women who choose this position. Women also choose other positions when given the opportunity, and with support, midwives can adapt to these positions as well.

Keywords: birth position, knowledge, attitude, practice, Tanzania

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Introduction

Maternal birth position refers to the physical postures a woman assumes during delivery and is classified by some authors as either horizontal or upright.[1] The upright birth positions include squatting, kneeling, hands-and-knees, and sitting - see Figure 1 and the Global Health video.[2] Women who give birth in an upright position experience several benefits compared to those in a horizontal position. This includes shorter second-stage labour, a good Apgar score, reduced risk of obstetric injuries, operative deliveries, and postpartum haemorrhage.[3,4] The World Health Organisation (WHO) recommends that every woman in

Figure 1a. Squatting position

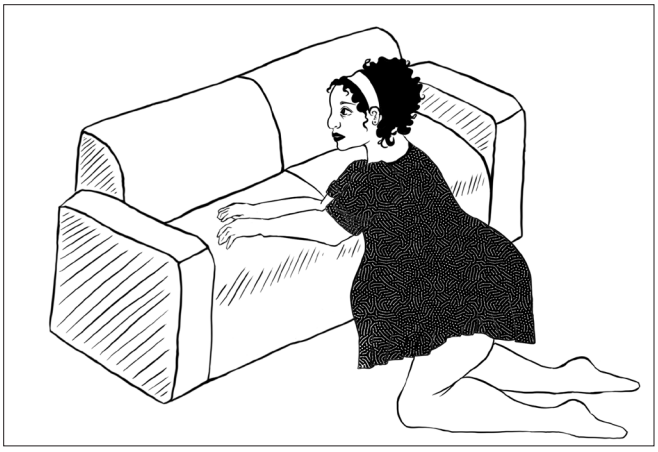

Figure 1b. Kneeling position

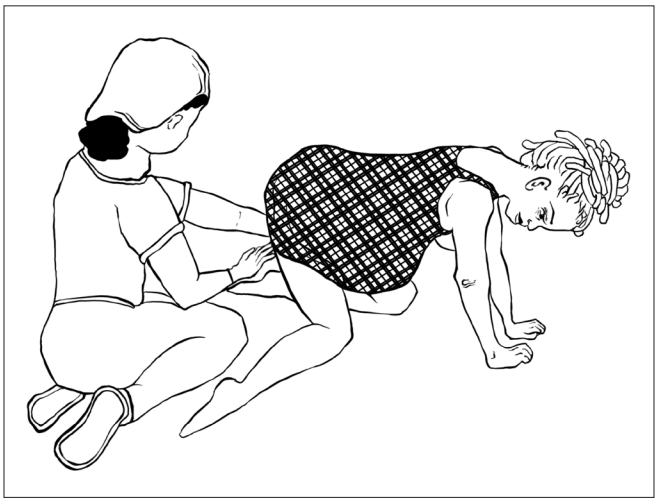

Figure 1c. Hands and knees position
(All figures drawn by Evie Rose Fairclough and Robin Conlan)

Figure 1d. Sitting position

labour be allowed to give birth in a position of her choice, with greater emphasis on the upright birth position due to its proven benefits.[5] Despite this recommendation, the majority of women in Tanzania still deliver in a horizontal position.[6] Several barriers to adopting the upright birth position have been identified, including limited knowledge and skills, a negative attitude, and an unsupportive work environment, such as a lack of necessary equipment for delivering in the upright position.[7,8]

In Tanzania, the upright birth position is not well researched. However, a previous study in South Africa reported that fewer than 1% of births occur in the upright position.[9] Due to this gap, this study aimed to assess nurses' and midwives' knowledge, attitudes, and practices regarding the upright birth position in maternity departments of hospitals in Dar es Salaam.

Method

Aims of the study were:

1. To assess the knowledge of conducting deliveries in the upright birth position among nurses and midwives working in the maternity department of public hospitals in Dar es Salaam.
2. To assess the attitude towards conducting deliveries in the upright birth position among nurses and midwives working in the maternity department of public hospitals in Dar es Salaam.
3. To determine the proportion of nurses and midwives working in the maternity departments of public hospitals in Dar es Salaam who conduct deliveries in the upright birth position.

This study was hospital-based, an analytical cross-sectional design using quantitative methods. It was conducted in labour wards in public health facilities in Dar es Salaam, Tanzania. The participants were nurses and midwives working in the labour wards with at least one year of experience in the role.

Sampling procedure

Since the total study population was known to be 750, the minimum required sample size was calculated using the formula for finite population sampling as proposed. [10] Assuming a population proportion of 50%, a 95% confidence level (Z = 1.96), and a 5% margin of error, the resulting sample size was 257 participants. To account for potential non-response, an additional 10% (26 participants) was added, resulting in the final total sample size of 283 participants.

A multistage sampling method was applied, involving two steps to select hospitals and participants.

A census method was employed to compile a sampling list of all district hospitals, regional referral hospitals, and tertiary hospitals in the Dar es Salaam region. These hospitals were stratified into three categories: tertiary, regional, and district hospitals. Purposive sampling was used to include all tertiary and regional referral hospitals. For district hospitals, a simple random sampling with replacement was used to select two hospitals from five.

In the second stage, all midwives and nurses working in the maternity ward were selected. The proportional allocation formula (Bourley's method) was applied to distribute a sample of 283 across the hospitals under study based on the number of nurses and midwives. Finally, at the ward level, purposive sampling was used to select eligible participants until the desired number per facility was reached.

Statistical analysis

Data were coded, cleaned, processed, and analysed using the Statistical Package for the Social Sciences. The participant's knowledge was measured using quartiles, of which three analytical groups were established: poor knowledge, moderate knowledge, and good knowledge.

Results

Sample characteristics

As presented in the Table 1. This study sample comprised 283 midwives and nurses, selected from the maternity departments of seven public hospitals in Dar es Salaam. Out of 283, 223 (78.8%) were female, and 60 (21.2%) were males, all between the ages of 25 and 52 years (mean age of 35.5±5.9). 222 (78.4%) participants were married, and the remaining 61 (21.6%) were single. In terms of education, 19.8% completed certificate courses, 51.2% completed diplomas, 26.5% bachelor's degrees, and 7 2.5% had master's degrees. Working experience ranged between 1 and 28 years (mean 9.5 and ± 5.9). The experience of work in the labour ward ranged from 1 to 20 years (mean 4.4 and ± 3.1).

Table 1. Participant's sociodemographic characteristics (N=283)

Variable	Response	Frequency n (%)
Wards	Antenatal	81 (28.6)
	Labour ward	130 (45.9)
	Postnatal	72 (25.5)
Sex	Female	223 (78.8)
	Male	60 (21.2)
Age	26-35	153 (54)
	36-45	106 (37.5)
	46-55	24 (8.5)
Level of education	Certificate	56 (19.8)
	Diploma	145 (51.2)
	Degree	75 (26.5)
	Masters	7 (2.5)
Marital status	Married	222 (78.4)
	Single	61 (21.6)
Years of experience	1-10	177 (63.5)
	11-20	86 (30.4)
	21-30	20 (7.1)
Years of work in labour ward	1-4	179 (63.3)
	5-10	91 (32.2)
	11-20	13 (4.6)

Knowledge

Out of 283 participants, 11.7% had good knowledge of the upright birth position, 56.5% had moderate knowledge, and 31.8% had poor knowledge. Figure 2.

The mean knowledge score among participants was 48.5%, with most correctly recognising that the upright birth position promotes proper foetal positioning (83.4%) and aids labour progression (74.8%). However, most participants did not have adequate knowledge of the upright birth position, and 88.3% were unaware that the upright position can also improve uterine contractions and reduce labour pain. 85.5% were unaware of positions that increase pelvic inlet size and reduce foetal heart rate changes linked to the supine position.

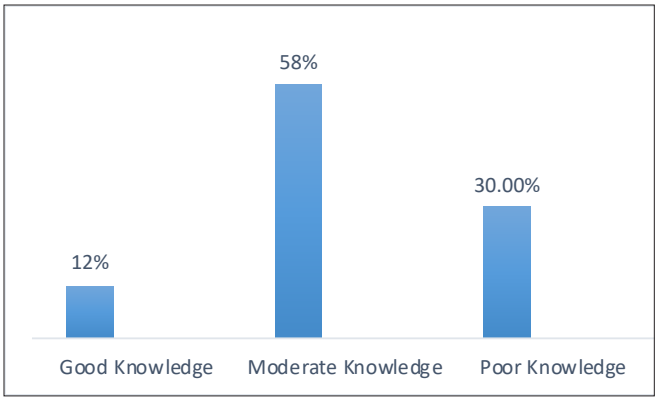

Figure 2. Participants' knowledge of the upright birth position (N=283)

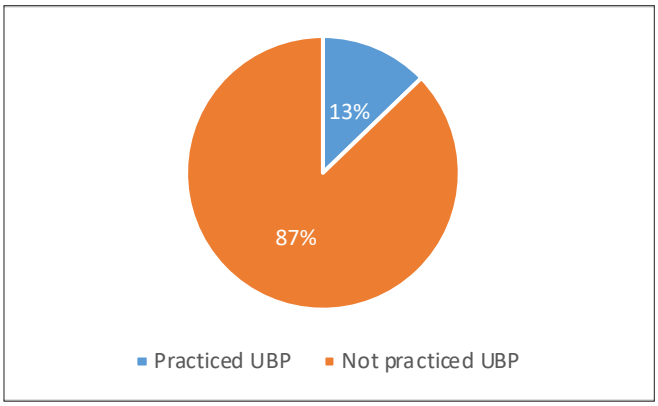

Figure 3. Proportion of health workers practising or not practising the upright birth position (N=283)

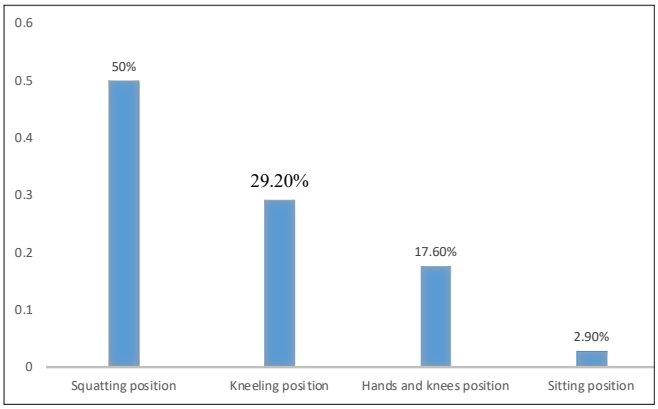

Figure 4. Types of upright birth position practised (N=37)

Attitude

78.1% of all participants had a positive attitude towards delivering pregnant women in an upright birth position (UBP), while 21.9% had a negative attitude; 80% of participants agreed that nurses and midwives should be trained in the upright birth position, that there should be guidelines for upright birth positions and that delivery rooms should be designed for conducting upright birth positions.

Upright birth position practice

Only 13.2% participants had ever conducted delivery in the upright position, while the remaining 245 (86.8%) had never practised it – Figure 3.

The most practised upright birth position was squatting at 50%, followed by kneeling at 29.2%, hands and knees at 17.6%, and sitting at 2.9%. – Figure 4.

Discussion

Knowledge

This study found that most participants had limited knowledge of upright birth, as evidenced by medium and low levels among the majority. This was similar to a previous study in Tanzania,[8] and another in China,[11] which reported that most nurses and midwives lack adequate knowledge of upright birth positions.

Attitude

Despite the low level of practice, this study found that the majority of participants had a positive attitude towards upright birth. This aligns with previous

studies in Tanzania[8] and Ethiopia,[12] which found that the majority of nurses and midwives have a positive view of the upright birth position but do not practice it. Additionally, the findings were similar to those of the studies in India[13] and Nigeria,[14] which reported that positive attitudes among nurses and midwives did not necessarily lead to the adoption of upright birth positions.

Practice

This study found that the practice of upright birth position was significantly low, with only 13% of nurses and midwives having delivered in an upright position. Similarly, a study by Huang and Jiang et al.[15] in their review of birth positions from around the world showed that in China and France, most midwives preferred dorsal positions, although in many Asian countries, the sitting position was preferred. In the same way, another study in Malawi reported that the majority of women (91.4%) delivered in a horizontal or supine position.[16]

Conclusion

This study found that only a very few midwives and nurses in Dar es Salaam practice upright birth. A possible reason for this is that most nurses and midwives lack adequate knowledge of the benefits of delivering women in an upright birth position, although the majority had a positive attitude towards it. Therefore, it is vital that, during pre-service and in-service training, nurses and midwives should be educated and supported about the benefits of delivering in an upright birth position.

Ethical approval: This was obtained from the University of Dodoma, and all ethical procedures were adhered to throughout the study.

Availability of material: The data for this study will be available upon reasonable request.

Competing interest: None.

Funding: This study was funded by the Ministry of Health of the United Republic of Tanzania.

Authors contributions: Conceptualisation: S.K.M; Methodology: S.K.M, S.A.S; Supervision: S.A.S, W.C.M; Writing- original draft: S.K.M, S.A.S; Writing, review and editing: S.A.S, W.C.M.

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Effect of 13-valent pneumococcal conjugate vaccine on the proportion of children under five with pneumonia at Bashair Teaching Hospital, Khartoum, Sudan

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ABSTRACT

Introduction: Pneumonia is a major respiratory infection that threatens children under five worldwide. The study aimed to estimate the proportion of children under five with pneumonia at Bashair Teaching Hospital in Khartoum, Sudan, the effect of the 13-valent Pneumococcal Conjugate Vaccine, and to examine correlations with gender, age, household size, mother's occupation and education, birth weight, breastfeeding in the first six months, immunization, previous pneumonia, and chronic disease.

Method: An observational cross-sectional study was conducted between May and September 2019. The chi-square test was used to analyse the association between the development of pneumonia infection and documented risk factors. A binary logistic regression was made for each risk factor with a p-value ≤ 0.05 and a 95% confidence interval.

Results: The proportion of pneumonia among the target children was 26.0%, compared to 36.2% in 2011 and 31.6% in 2012. Association of pneumonia was statistically significant (P ≤0.05) with vaccination status (OR=5.059, 95% CI 1.485 - 17.2367, p = 0.010), and chronic disease (AOR=0.147, 95% CI 0.032-0.674, p=0.014).

Conclusion: A reduced proportion of pneumonia has led to a decrease in mortality among children under five following the introduction of the candidate vaccine. Further studies are needed to establish associations between other risk factors and the development of pneumonia to support children's health.

Keywords: pneumonia risk factors, pcv13, immunization coverage, measles vaccination, children under five years, Sudan

Citation: Ugoro. Effect of 13-valent pneumococcal conjugate vaccine on pneumonia prevalence in children under five at Bashair Teaching Hospital, Khartoum, Sudan. South Sudan Medical Journal, 2026;19(1):19-25 DOI: https://dx.doi.org/10.4314/ssmj.v19i1.4

Introduction

Pneumonia is an acute lung infection causing painful breathing and hypoxia. [1] Classified as CA40 in the International Classification of Diseases, it includes infectious pneumonia but excludes pneumonitis. Infectious pneumonia presents

with fever, chills, and cough with sputum. It is mainly caused by *Streptococcus pneumoniae* and respiratory syncytial virus, with less common causes such as *Haemophilus influenzae* type b and *Pneumocystis jiroveci*.[1-3] Risk factors include malnutrition, low birth weight, early breastfeeding during the first four months, immunization, indoor pollution, and overcrowding.[4-6]

Both global and regional data show decreases in pneumonia-related child deaths,[7-9] but vaccine failure has been observed in some areas.[10] Pneumonia remains the leading cause of death in children under five, accounting for 14%, especially in sub-Saharan Africa.[1] In 2014, a survey found children under five make up 15% of Sudan's population, with pneumonia causing 10% of hospital deaths, making it the second leading cause after septicaemia.[11] According to the Ministry of Health's Annual Statistical Report, the proportion of pneumonia among children visiting Bashair Teaching Hospital (BTH) in Khartoum State, Sudan, was 36.2% in 2011 and 31.6% in 2012.

Evidence shows that Sudan introduced the first dose of 13-valent Pneumococcal Conjugate Vaccine (PCV13) in 2013, but its evaluation is limited. Few independent studies assess its impact on pneumonia in children under five. This paper examines PCV13's effectiveness on pneumonia cases among children under five at BTH.

Method

An observational cross-sectional procedure between May and September 2019 was designed targeting children under five years old who completed the three primary doses of PCV13 at 6, 10, and 14 weeks (Expanded Programme on Immunization, Ministry of Health, Sudan, 2019)

Study setting: BTH is a public health facility 16 Km south of Khartoum, adjacent to Al-Nasr Administrative Unit, Jabel Aulia Locality (JAL).

Sample size and sampling technique: Sample size was calculated based on the number of children under five targeted for routine vaccination at BTH in 2019. The following Slovin's Formula was used:

$$n = N/ (1 + N. e2)$$

Where: n = Sample size

N = Total Study Population in BTH

e = margin of error (set at 0.05)

Two hundred parents of the targeted children were randomly selected and interviewed. Samples were collected from the vaccinated children at the hospital in accordance with Standard Operating Procedures (SOPs). Structured questionnaires were administered to respondents. The pneumonia proportion (PP) among children was estimated based on completion of PCV13 doses, including only children over 14 weeks of age (inclusion criteria) and excluding those with a different vaccination schedule (exclusion criteria). Professional diagnoses for all selected children were reviewed in reference to the hospital's treatment protocol. Investigation tests for each case of pneumonia were displayed and documented on the admission sheet. Non-infectious pneumonia due to other complications/pneumonitis (CA70) was excluded.

PP = The number of pneumonia cases/ Total number of children under five years x 100.

PP was compared with the proportions in 2011 and 2012. The latter were calculated from morbidity and mortality records at the BTH.

Data Analysis: Statistical Package for the Social Sciences (SPSS) version 20 and Excel 2016 were used for descriptive and inferential statistics. The chi-square test was also used to analyse the association between the development of pneumonia and documented risk factors. A binary logistic regression was made for each risk factor with a p-value ≤ 0.05 and a 95% confidence interval.

Study variables:

- Dependent variable: pneumonia among children under five.
- Independent variables:
  - Sociodemographic factors: Age, sex, household size, mother's education status, mother's occupation
  - Health facility and childcare factors: measles vaccination, exclusive breastfeeding, weight at birth, previous pneumonia infection, and chronic diseases (non-communicable diseases, e.g., cardiovascular diseases, diabetes, asthma, etc).
- Environmental risk factor: indoor pollution

Ethical consideration:

Ethical approval was obtained from the Ethics Committee at Khartoum Ministry of Health (KMOH-REC-1-2020). All participants' parents or guardians gave informed consent. Data were secured and coded to ensure confidentiality.

Results

Proportion of pneumonia infection among children

Pneumonia (CA40) was recorded in 26% (52) of the study samples, compared with 74% (148) for other diseases or complications. Figure 1 shows a reduction in PP to 26.0% among the target under-five children in 2019, compared with 36.2% and 31.6% in 2011 and 2012, respectively. Demographic and other relevant variables for children under 5 years old with pneumonia are shown in Table 1.

Effect of 13-valent pneumococcal conjugate vaccine on pneumonia proportion

Cross tabulation–chi-square test analysis showed a statistically significant association (Pearson chi-square = 7.993, p=0.005) between clinical diagnosis (pneumonia and non-pneumonia) and vaccination (non-completed vaccination and completed vaccination). Other pneumonia-related risk factors are also presented in Table 2.

Modelling of factors associated with the development of pneumonia infection

Clinical diagnosis (pneumonia and non-pneumonia) was analysed using a binary logistic regression model (chi-square = 29.810, p = 0.002), with an overall accuracy rate of 75.9%. The model showed that vaccination status is five times more likely (OR = 5.059, 95% CI 1.485-17.236, p = 0.010) to contribute to the development of pneumonia. The analysis reveals other factors that contribute to the disease: percentage of variation in independent variables, adjusted odds ratios, and p-values are presented in Table 3.

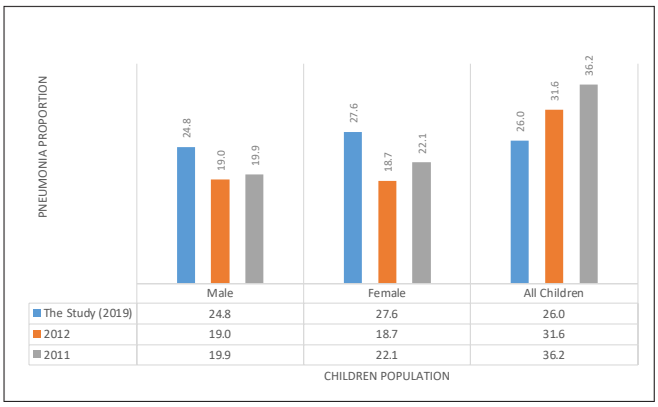

Figure 1. Pneumonia proportion among children under study at Bashair hospital; Data source: Annual Statistical Report at Bashair Hospital/ Khartoum, Ministry of Health

Table 1. Characteristics of under-five children infected with pneumonia (N=52)

Variable	n (%)
Sex	
Male	28 (53.8%)
Female	24 (46.2%)
Age	
≥4M ≤ 2Y	44 (84.6%)
>2Y <5Y	8 (15.4%)
Household size	
≤3 member	2 (3.8%)
4-7 members	20 (38.5%)
8+ member	30 (57.7%)
Mother occupation	
Employed	9 (17.3%)
Non-employed	43 (82.7%)
Mother education	
Illiteracy	14 (26.9%)
Primary level	26 (50.0%)
Secondary level or above	12 (23.1%)
Measles vaccination	
Completed	49 (94.2%)
missed 1st dose	2 (3.8%)
missed 2nd dose	1 (2.0%)
Immunization card	
Available	50 (96.2%)
Unavailable	2 (3.8%)
Weight at birth	
Standard weight range	51 (98.1%)
low birth weight	1 (1.9%)
Exclusive breastfeeding	
≥6 months	35 (67.3%)
< 6 months	17 (32.7%)
Previous Pneumonia infection	
Yes	18 (34.6%)
No	34 65.4%)
Chronic Disease	
Yes	2 (3.8%)
No	50 (96.2%)

Table 2. Cross tabulation between pneumonia and child background factors (N=200)

Independent variable	Non-pneumonia n (%)	Pneumonia (CA40) n (%)	p-value
Vaccination			
Non-completed vaccination	35 (23.6%)	3 (5.8%)	Pearson chi-Square 7.993, p=0.005*
Completed vaccination	113 (76.4%)	49 (94.2%)	
Child age			
4m - 2y	108 (73%)	44 (84.6%)	Pearson chi-Square 2.860, p=0.091
> 2 y < 5 y	40 (27%)	8 (15.4%)	
Child sex			
Male	85 (57.4%)	28 (53.8%)	Pearson chi-Square 0.201, p=0.654
Female	63 (42.6%)	24 (46.2%)	
Household size			
≤ 3 members	12 (8.1%)	2 (3.8%)	Pearson chi-Square 3.300, p=0.192
4 - 7 members	71 (48.0%)	20 (38.5%)	
8+ members	65 (43.9%)	30 (57.7%)	
Mother occupation			
Employed	19 (12.8%)	9 (17.3%)	Pearson chi-Square 0.639, p=0.424
Not-employed	129 (87.2%)	43 (82.7%)	
Mother education			
Non-educated	48 (32.4%)	14 (26.9%)	Pearson chi-Square 0.546, p=0.460
Educated	100 (67.6%)	38 (73.1%)	
Indoor pollution			
Non-smoker parent	92 (62.2%)	30 (57.7%)	Pearson chi-Square 0.323, p=0.570
Smoker parent	56 (37.8%)	22 (42.3%)	
Birth weight			
Low birth weight	7 (4.8%)	1 (1.9%)	Fisher's Exact Test 0.683
Standard weight range	140 (95.2%)	51 (98.1%)	
Exclusive breastfeeding			
< 6 months	61 (41.2%)	17 (32.7%)	Pearson chi-Square 1.175, p=0.278
≥ 6 months	87 (58.8%)	35 (67.3%)	
Previous pneumonia infection			
No	108 (73.0%)	34 (65.4%)	Pearson chi-Square 1.076, p=0.300
Yes	40 (27.0%)	18 (34.6%)	
Chronic disease			
No	118 (79.7%)	50 (96.2%)	Pearson chi-Square 7.723, p=0.005*
Yes	30 (20.3%)	2(3.8%)	

(*) mean statistically significant p-value

Table 3. Binary logistic regression analysis of factors associated with the development of pneumonia infection (N=200)

Explanatory variables	Coefficient of contribution	Standard error	Chi-square	p-value	AOR (95% CI)
Age	-0.461	0.466	0.978	0.323	0.630 (0.253-1.573)
Sex	0.02	0.358	0.003	0.956	1.020 (0.506-2.056)
Household size	0.411	0.304	1.83	0.176	1.509 (0.831-2.739)
Mother occupation	-0.431	0.515	0.701	0.403	0.650 (0.237-1.784)
Mother education	0.395	0.396	0.991	0.319	1.484 (0.682-3.227)
Indoor pollution	0.147	0.367	0.161	0.689	1.159 (0.564-2.381)
Birth weight	0.844	1.168	0.522	0.47	2.326 (0.236-22.972)
Exclusive breastfeeding	0.465	0.374	1.551	0.213	1.592 (0.766-3.311)
Previous pneumonia infection	0.529	0.383	1.907	0.167	1.698 (0.801-3.599)
Chronic disease	-1.918	0.777	6.093	0.014	0.147 (0.032-0.674)
Vaccination status	1.683	0.653	6.633	0.01	5.381 (1.495-19.367)
Intercept*	-4.901	2.859	2.938	0.087	0.007

(*) The predicted value of the development of pneumonia variable when all explanatory variables in the regression model are zero

Discussion

This study has revealed a reduction in the PP compared to 2011 and 2012, prior to the introduction of the pneumococcal vaccine. Data reviewed at the Ministry of Health, Khartoum State, indicate an overall decline in the PP from 2011 through 2018. This aligns with information on PCV13 cumulative coverage in the Al-Nasr Administrative Unit for the BTH, JAL, and Khartoum State. It represents high coverage, approximately 95%, except in 2013, when the pneumococcal vaccination campaign began. This high vaccine coverage may provide community-level protection against pneumonia. Such a scenario of herd immunity has been supported by Fine et al (2011).[12] Evidence shows that the introduction of the pneumococcal vaccine in low-income countries in Africa has been successful.[9,13]

However, data on PP at BTH show a dissimilar picture, and various conclusions may be drawn from this, including the selected participants' characteristics and the season during which the study took place. It seems that the study's inclusion criteria may have a consequence on the proportions of diseases recorded. Failure of pneumococcal vaccination was rarely observed in a systematic literature review by Oligbu G, et al [2016].[10]

This study has identified vaccination and chronic disease as statistically associated with the development of pneumonia in children under five. However, the data showed a higher percentage of the infected children had completed vaccination. Moreover, a high proportion of children with pneumonia had no chronic disease, which is not in line with expectations. Such disparities in vaccination completion could be explained by measles vaccine coverage, which in Khartoum State has been below 95% from 2013 through 2018, compared with above 95% at JAL since 2015 onward. Vaccine coverage in the Al-Nasr area, including BTH, was below 95% in 2017. The 95% identified by the Federal Ministry of Health as the target percentage was intended to create herd immunity, which is important for community protection. Because of social interaction in less-protected areas, outbreaks have flared up, but JAL, with vaccine coverage above 95%, has also reported measles outbreaks. The continuous outbreaks of measles could then mean that getting the measles vaccine itself prior to the first year of life is not the only essential condition to protect children against the disease. It seems that other contributing factors related to vaccination processes, such as vaccine quality and storage conditions, and administration technique, could be incriminated. Therefore, the same conditions associated with effective measles vaccine coverage may also be considered risk factors for the development of pneumonia. On the other hand, data on the presence or absence of the chronic disease were not clinically verified for each studied child. This might have confounded the data.

Other reviewed risk factors showing no statistically significant association with the development of pneumonia infection might be attributed to dependence on the parents' recall information without verification, which may have affected the interpretation of the results. However, this might be exemplified by a child's birth weight recorded on immunization cards and the denial by the respondent of the mother's smoking habit, among others. In this study, the risk factors are similar to the findings of Jackson et al. (2013) and Onyango et al. (2012), who found that immunization and co-morbidity, among others, were significantly associated with severe acute lower respiratory infections and also played a role in the development of severe pneumonia in children under five.[5,14]

Within the framework of public health interventions to improve the quality of life for children under five, counselling should focus on mothers and carers. Decision-makers should ensure that health services are more affordable for children under five with chronic illnesses.

Conclusion

In conclusion, a reduction in the PP after the use of PCV13 in children under five at the BTH was observed. No obvious association between some risk factors and the development of pneumonia infection has been established. Further research on the efficacy of PCV13 is recommended for the sustenance of children's health and growth in similar health contexts.

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Nutrition Survey Finds Unprecedented Level of Child Malnutrition in Part of Sudan's North Darfur

Bishar Mayow/MSF
29 December 2025
United Nations Children's Fund (New York)

New York/Port Sudan — Comprehensive nutrition survey in Um Baru locality found more than 50 per cent of children under five acutely malnourished

New data from UNICEF's latest SMART* survey in Um Baru locality, in Sudan's North Darfur, reveals that more than half of children assessed were acutely malnourished, with one in six suffering from severe acute malnutrition, a life-threatening condition that can kill a child in weeks if left untreated.

The nutrition survey, conducted between 19 and 23 December and screening almost 500 children, found a Global Acute Malnutrition (GAM) rate of 53 per cent, with 18 per cent of children suffering from Severe Acute Malnutrition (SAM) and 35 per cent from Moderate Acute Malnutrition (MAM), among the highest malnutrition rates recorded in a standarised nutrition survey anywhere in the world, and more than three times the World Health Organisation (WHO) emergency threshold of fifteen per cent.

"When severe acute malnutrition reaches this level, time becomes the most critical factor," said UNICEF Executive Director Catherine Russell. "Children in Um Baru are fighting for their lives and need immediate help. Every day without safe and unhindered access increases the risk of children growing weaker and more death and suffering from causes that are entirely preventable."

Research Article

Self-medication and associated factors: A cross-sectional study among undergraduate students at the University of Juba, South Sudan

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ABSTRACT

Introduction: Self-medication (SM), the use of unauthorized medicines for self-diagnosed disorders or symptoms, is a global problem in healthcare delivery. Although SM can provide quick relief for minor ailments, it also poses significant risks, including misdiagnosis, adverse reactions, and antimicrobial resistance. There is currently scant evidence on SM in South Sudan. Therefore, this study aimed to assess its prevalence, use, and associated factors among undergraduate students at the University of Juba.

Method: A cross-sectional descriptive study was conducted at the University of Juba. A three-stage sampling technique was used to select 384 students. Data were collected through a researcher-administered structured questionnaire. Using IBM SPSS 23.0, descriptive statistics were obtained, and chi-squared tests and multivariate logistic regression analysis were performed to identify significantly associated factors.

Results: Of 324 respondents, the modal age group was 23-27 years (206 participants); males were the dominant group (63%). 275 were single, and 299 (78%) were Christians. The prevalence of SM in the last six months was 75.6%. Analgesics, antibiotics, and antimalarial medications were the most used therapeutic groups. Logistic regression analysis showed quality of sleep (aOR 0.22, 95% CI 0.08-0.64, p-value 0.005) and source of medication information (aOR 0.15, 95% CI 0.05-0.50, p-value 0.002) as significantly associated predictors in this study.

Conclusion: Self-medication is highly prevalent among undergraduate students at the University of Juba. It is associated with peer influence, sleep quality, and the source of medication information. The study recommends strengthening regulations on rational medication use and increasing awareness among the students at the university.

Keywords: self-medication, students, University of Juba, South Sudan

Introduction

Self-medication (SM) is 'the use of medicines to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of prescribed drugs for chronic or recurrent diseases or symptoms'.[1] Patients make the decision when they believe the severity of their symptoms warrants drug therapy, but not to the extent of justifying a physician's consultation.[2] According to the World Health Organization (WHO), SM serves a purpose, such as the convenience of obtaining appropriate medications for conditions that do not require consultation, but such medications should be prescribed by law only if proven to be fit for the purpose.[1] The problem is therefore inappropriate use of prescription-only medicines, which seems to be widespread.

Globally, several studies report varying levels of SM. For instance, in a Jordanian study, prevalence was as high as 98.4% while it was 92.4% in Iraq, 87.1% in Yemen, 81.3 in Serbia, 78% in Sri Lanka, 66.4%, and 54.3% in Portugal.[2–7] In these settings, SM is influenced by age, educational level, and family attitudes, advertising of drugs by manufacturers, lack of legislation regulating dispensing and sale of drugs, previous experiences with the symptoms or disease, and significance attributed to the disease.

In the African Continent, a systematic review involving 19 countries reported SM prevalence ranging from 12.1% to 93.9%.[8] There is marked heterogeneity across African countries and settings, as the practice is reportedly highest (96.9%) among medical students at Sudan International University, with lower findings in other countries, including 69.4% in Nigeria, 62.9% among university students in Egypt, 61.1% among medical students at the Copperbelt University in Zambia.[9–11] From these studies, SM is attributed to shortages of drugs at health facilities, long waiting time, long distance from health facilities, inability to pay for health care charges and the freedom to choose the preferred drugs, lack of medical professionals, poor quality of healthcare facilities, unregulated distribution of medicines and patients' misconception about physicians, mildness of disease, familiarity with the drug and illness.

The WHO guidelines for the regulatory assessment of medicinal products for use in SM associate SM with many problems, ranging from incorrect self-diagnosis to excessively prolonged use, risk of dependence and abuse, as well as storage of medicines in incorrect conditions or beyond the recommended shelf life.[1] This makes the practice a major public health problem. Despite several studies conducted in other settings, there is inadequate evidence on SM in South Sudan, and none has been conducted among university students. Therefore, this study aimed to assess the prevalence, commonly used medicines, and associated risk factors of SM among undergraduate students at the University of Juba.

Method

The study was conducted at the University of Juba, South Sudan's premier university, located in Juba, the country's administrative and economic hub. Since 1975, the university has grown and currently hosts 40,000 students across 22 Schools, 3 Institutes, and 4 specialized centres, of which 4,000 are postgraduate students. This study targeted the undergraduate students, estimated at more than 36,000.[12]

A cross-sectional design was adopted. Primary quantitative data were collected from a convenience sample of students using a pretested structured questionnaire. Cochran's formula was used to estimate the sample size; it assumed a confidence level of 95% and a prevalence of 50%, resulting in a sample of 384. The sampling procedure was as follows: First, the university's natural clusters, i.e., colleges/institutes/centres, were identified. Second, the clusters were randomly selected by assigning each college a unique identifier (e.g., College 1, College 2, etc.), and students were selected via a lottery. Next, all selected students in the selected clusters were interviewed based on their presence and willingness to participate. Three teams, each consisting of two data collectors, were dispatched to the selected clusters. To participate in this study, one had to be a University of Juba student aged 18 years and above, and willing to participate.

Prevalence of SM in the last six months was the variable of interest and the dependent variable in the regression analysis. Variables recorded that could potentially affect SM included demographic factors (Age, Sex, Marital status, Residence, Religion and Year of study), social factors (peer influence, family influence, cultural beliefs, stress and social supports), economic factors (income status, employment and willingness to pay), educational factors (academic pressure, exam anxiety and workload coping mechanisms e.g. use of stimulants or relaxants), previous healthcare experiences (satisfaction with previous medical service, past adverse drug reactions and trust in medical practitioners), health system factors (distance to nearest health facility, health insurance status, cost of medical consultation, frequency of common illness and chronic disease) and medication specific factors (types of

medication and frequency and dosage of medication).

Epidata Manager 4.6.0.6 and IBM SPSS 23.0 were used for quality-assured data entry and analysis, respectively. Descriptive statistics, chi-squared tests, and regression analyses were performed. At a 95% confidence limit, p-values less than or equal to 0.05 were considered significant.

Mindful of quality assurance, we followed the approved protocol, trained enumerators in ethical data collection, and pretested the questionnaire with 10 students who did not participate in the final sample. In addition, quality checks were carried out daily, and corrective actions were taken before the next session. Ethically, this study was expected to cause minimal or no harm

Table 1. Relation of general characteristics of the respondents to self-medication

Variables		Did you self-medicate within the last six months?		Total n (%)	p-value
		Yes n (%)	No n (%)		
Age group in years	18-22	46 (74.2)	16(25.8)	62 (19.1)	0.860
	23-27	155 (75.2)	51 (24.8)	206 (63.6)	
	28-32	40 (76.9)	12 (23.1)	52 (16.0)	
	33-42	4 (100.0)	0 (0)	4 (1.2)	
Sex	Male	147 (72.1)	57 (27.9)	204 (63.0)	0.052
	Female	98 (81.7)	22 (18.3)	120 (37.0)	
Marital Status	Single	210 (76.4)	65 (23.6)	275 (84.9)	0.093
	Married	34 (75.6)	11 (24.4)	45 (13.9)	
	Divorced/separated	1 (25.0)	3 (75.0)	4 (1.2)	
Religion	Christian	226 (75.6)	73 (24.4)	299 (92.3)	0.777
	Muslim	15 (78.9)	4 (21.1)	19 (5.9)	
	African traditional believer	3 (60.0)	2 (40.0)	5 (1.5)	
	Others	1 (100.0)	0 (0)	1 (0.3)	
School	Computing and Information Technology	23 (85.2)	4 (14.8)	27 (8.3)	0.606
	Engineering and Architecture	29 (70.7)	12 (29.3)	41 (12.7)	
	Medicine	49 (80.3)	12 (19.7)	61 (18.8)	
	Petroleum and Mining	4 (57.1)	3 (42.9)	7 (2.2)	
	Applied and Industrial Science	24 (82.8)	5 (17.2)	29 (9.0)	
	Business and Management	21 (70.0)	9 (30.0)	30 (9.3)	
	Medical Laboratory	26 (78.8)	7 (21.2)	33 (10.2)	
	Natural Resources & Environmental Studies	30 (68.2)	14 (31.8)	44 (13.6)	
	Veterinary Medicine	25 (78.1)	7 (21.9)	32 (9.9)	
	Law	14 (70.0)	6 (30.0)	20 (6.2)	
Presence of long-term condition	Yes	14 (82.4)	3 (17.6)	17 (5.2)	0.772
	No	231 (75.2)	76 (24.8)	307 (94.8)	
Total		**245 (75.6)**	**79 (24.4)**	**324 (100)**	

Table 2. Relation of health status-related factors to self-medication

Variables		Did you self-medicate within the last six months?		Total n (%)	p-value
		Yes n (%)	No n (%)		
Smoking status	Yes	8 (80.0)	2 (20.0)	10 (3.1)	0.743
	No	237 (75.5)	77 (24.5)	314 (96.9)	
Alcohol consumption status	Yes	18 (85.7)	3 (14.3)	21 (6.5)	0.265
	No	227 (74.9)	76 (25.1)	303 (93.5)	
Type of medication most frequently used for self-medication	Analgesics	130 (75.1)	43 (24.9)	173 (53.4)	0.037*
	Antibiotics	35 (79.5)	9 (20.5)	44 (13.6)	
	Cold/Influenza medications	15 (62.5)	9 (37.5)	24 (7.4)	
	Herbal or traditional medicines	8 (66.7)	4 (33.3)	12 (3.7)	
	Cough syrups	9 (90.0)	1 (10.0)	10 (3.1)	
	Anti-malarial	44 (86.3)	7 (13.7)	51 (15.7)	
	Anti-diarrhoeal medications	2 (33.3)	4 (66.7)	6 (1.9)	
	Others	2 (50.0)	2 (50.0)	4 (1.2)	
Peer influence	No	79 (66.9)	39 (33.1)	118 (36.4)	0.006*
	Yes	166 (80.6)	40 (19.4)	206 (63.6)	
Influence of cultural beliefs decision making	Yes	64 (75.3)	21 (24.7)	85 (26.2)	0.936
	No	181 (75.7)	58 (24.3)	239 (73.8)	
Source of information on medications	Pharmacy	138 (78.9)	37 (21.1)	175 (54)	0.005*
	University health talks	26 (68.4)	12 (31.6)	38 (11.7)	
	Medical leaflets	59 (80.8)	14 (19.2)	73 (22.5)	
	Friends	15 (75.0)	5 (25.0)	20 (6.2)	
	Class	7 (38.9)	11 (61.1)	18 (5.6)	
Reasons for choosing self-medication	It's cheaper than seeing a doctor	106 (78.5)	29 (21.5)	135 (41.7)	
	It saves time	46 (75.4)	15 (24.6)	61 (18.8)	0.649
	I don’t feel my symptoms are serious enough for a doctor	41 (73.2)	15 (26.8)	56 (17.3)	
	It's more convenient	14 (77.8)	4 (22.2)	18 (5.6)	
	I can't afford medical consultation	20 (71.4)	8 (28.6)	28 (8.6)	
	I prefer managing my health myself	12 (80.0)	3 (20.0)	15 (4.6)	
	Academic pressure	4 (66.7)	2 (33.3)	6 (1.9)	
	Examination anxiety	2 (40.0)	3 (60.0)	5 (1.5)	
Self-rating of the quality of sleep	Poor	49 (90.7)	5 (9.3)	54 (16.7)	0.005*
	Good	196 (72.6)	74 (27.4)	270 (83.3)	
Use of stimulants or relaxants for stress relief	Yes	38 (73.1)	14 (26.9)	52 (16.0)	0.641
	No	207 (76.1)	65 (23.9)	272 (84.0)	
Total		**245 (75.6)**	**79 (24.4)**	**324 (100)**	

to the respondents since it did not involve any invasive procedures. Nevertheless, all ethical principles of autonomy, beneficence, non-maleficence, and justice were followed diligently. Institutional ethical clearance was obtained from the School of Medicine, University of Juba (Ref. SM/17/24), then from the University of Juba Administration, and informed consent was obtained from each participant prior to data collection.

Results

Table 1 shows the relation of general characteristics of the respondents and self-medication. Of the 384 initial sample, only 84.4% (324) responded. Out of this, the modal age group (63.6%) was 23-27 years, with males being dominant (63%), and 84.9% were single. The majority (92.3%) were Christians, and only 5.2% (17) reported having a long-term illness. Around 76% (210) of single students said they practised SM, while Computing and Applied and Industrial Science have the highest proportion.

Analgesics (53.4%) were the main medications used for SM, followed by antimalarial medicines, with the least used being cough syrups (3.1%). Most respondents (63.6%) admitted peer influence on their decision about SM (Table 2).

Table 3. Relation of other health status factors of the respondents to self-medication

Variables		Did you self-medicate within the last six months?		Total n (%)	p-value
		Yes n (%)	No n (%)		
Satisfaction with previous medical services	Yes	189 (76.2)	59 (23.8)	248 (76.5)	0.654
	No	56 (73.7)	20 (26.3)	76 (23.5)	
Experience of adverse reactions to medications	Yes	46 (78.0)	13 (22.0)	59 (18.2)	0.561
	No	199 (75.1)	66 (24.9)	265 (81.8)	
Extent of trust in medical practitioners	Very much	84 (75.7)	27 (24.3)	111 (34.3)	
	Somehow	103 (76.9)	31 (23.1)	134 (41.4)	0.893
	I don't	12 (80.0)	3 (20.0)	15 (4.6)	
	Little	36 (73.5)	13 (26.5)	49 (15.1)	
	Very little	10 (66.7)	5 (33.3)	15 (4.6)	
Distance from the nearest health facility to you	Very close	91 (72.2)	35 (27.8)	126 (38.9)	0.517
	A little far	121 (78.1)	34 (21.9)	155 (47.8)	
	Very far	33 (76.7)	10 (23.3)	43 (13.3)	
Health insurance status	Yes	34 (82.9)	7 (17.1)	41 (12.7)	0.243
	No	211 (74.6)	72 (25.4)	283 (87.3)	
Do you find the university health services easy to access?	Yes	119 (74.8)	40 (25.2)	159 (49.1)	0.750
	No	126 (76.4)	39 (23.6)	165 (50.9)	
Have you experienced any common illnesses recently?	Yes	189 (75.9)	60 (24.1)	249 (76.9)	0.827
	No	56 (74.7)	19 (25.3)	75 (23.1)	
Likelihood of seeking professional care when falling sick	Yes	127 (76.0)	40 (24.0)	167 (51.5)	0.730
	No	8 (88.9)	1 (11.1)	9 (2.8)	
	Sometimes	110 (74.3)	38 (25.7)	148 (45.7)	
Total		**245 (75.6)**	**79 (24.4)**	**324 (100)**	

Table 4. Logistic Regression Analysis: Predictors of Self-medication

Variables	cOR (95% CI)	p-value	aOR (95% CI)	p-value
Peer Influence				
No	Ref.			
Yes	2.05 (1.22,3.43)	0.006	1.75 (0.98,3.12)	0.061
Quality of Sleep				
Poor	Ref.			
Good	0.27 (0.10,0.71)	0.007	0.22 (0.08,0.64)	0.005
Source of information on medications				
Pharmacy	Ref.			
University health talks	0.58 (0.27,1.26)	0.169	0.56 (0.24,1.34)	0.195
Medical leaflets	1.13 (0.57,2.25)	0.727	1.45 (0.66,3.19)	0.350
Friends	0.80 (0.27,2.36)	0.691	0.75 (0.23,2.45)	0.635
Class	0.17 (0.06,0.47)	0.001	0.15 (0.05,0.50)	0.002
Type of medications most frequently used for SM				
Painkillers	Ref.			
Antibiotics	1.29 (0.57,2.89)	0.542	1.22 (0.50,2.96)	0.663
Cold/Influenza medication	0.55 (0.23,1.35)	0.192	0.46 (0.17,1.24)	0.123
Cough syrups	2.98 (0.37,24.18)	0.307	1.35 (0.16,11.48)	0.781
Herbal or traditional medicines	0.66 (0.19,2.31)	0.517	0.62 (0.14,2.67)	0.522
Anti-malarial	2.08 (0.87,4.96)	0.099	1.76 (0.69,4.52)	0.240
Anti-diarrhoea	0.17 (0.03,0.94)	0.042	0.15 (0.02,1.14)	0.067
Others	0.33 (0.05,2.42)	0.276	0.62 (0.06,6.25)	0.682

Out of 248 respondents reporting satisfaction with previous medical services, 76.2% self-medicated in the last six months preceding the study. Similarly, 75.1% of those who did not experience adverse reactions practised SM (Table 3).

Overall, 75.6% (245) of respondents reported SM, with more than 80% of females reporting SM. Of SM users, 94.3% (231) did not have long term conditions, 96.7% (237) were non-smokers, and 92.7% (227) did not drink alcohol (Tables 1 and 2).

Factors that were significant at bivariate analysis (peer influence, sources of medication information, type of medication and self-rating of the quality of sleep) were subjected to logistic regression analysis (Table 4). Students who had good quality of sleep were significantly less likely to SM (aOR 0.22, 95% CI 0.08-0.64, p-value 0.005), as were those who got information from members of their class, rather than from a pharmacy (aOR 0.15, 95% CI 0.05-0.50, p-value 0.002). There were no other significant associations.

Discussion

This study assessed the level and associated factors of SM among the University of Juba undergraduate students, as well as the commonly used medicines. Seventy-five percent of respondents admitted engaging in SM, and this was associated with the source of information and the quality of sleep. These findings are lower than the prevalence reported by studies conducted in Sri Lanka (78%), Iraq (92.4%), Jordan (98.4%), Serbia (81.3%), and Sudan, where SM was practiced by almost the entire sample (96.9%).[2,3,5,7,9] They are, however, higher compared to

findings from studies conducted in African countries such as Nigeria (69.4%) and Egypt (62.9%).[10] Given the estimated Global and sub-Saharan Africa antibiotic SM of 43% and 55.2%, respectively, our findings warrant particular attention, as antibiotics are among the most affected medicines in this study.[13] In consonance with our findings, studies conducted in Ethiopia and Jordan reported analgesics at the top of the list along with antibiotics, while in India, allopathic remedies featured, a manifestation of regional preferences of medication use.[2,14,15]

Our study found a significant association between SM and the source of medication information and sleep quality, but no relationship with factors such as academic pressure, financial constraints, ease of access to medications, prior experience with similar illnesses, and family influence. These findings are not consistent with those from Zambia, which identified economic and social factors as key determinants of SM.[11] A similar study among students in Uganda reported the reasons for SM as minor illness, time-saving, old prescriptions, and high consultation fees.[16] There is a need to further investigate the specific role of peers and the effects of the high levels of SM at the university.

Conclusion

Self-medication is widely practiced among undergraduate students at the University of Juba and involves the free use of analgesics, antibiotics, cold/influenza medications, herbal or traditional medicines, and cough syrups. The practice is significantly associated with peer influence, source of medication information, and sleep quality. The study recommends enforcing standard treatment guidelines and accurately implementing drug use plans to mitigate SM practices. An awareness intervention is also recommended at the University to address peer influence and sleep quality.

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Unicef Executive Director Calls for Urgent Action and Sustained Investments for Children in South Sudan

5 December 2025
United Nations Children's Fund (New York)

Juba — Climate shocks, conflict and instability are putting millions of children at risk across the world's youngest nation

UNICEF Executive Director Catherine Russell today concluded a visit to South Sudan, urging the Government and the international community to step up efforts to protect children's lives amid escalating conflict, climate shocks and mass displacement in the world's youngest country.

Russell's visit spotlighted the deepening needs of South Sudan's children. More than 2.1 million children under the age of five are at risk of malnutrition, and 9.3 million, three-quarters of the population, require life-saving humanitarian support. In addition, nearly 1.3 million refugees and returnees fleeing the war in Sudan have arrived in South Sudan, adding pressure to limited water, food and medical services.

More than one-third of UNICEF-supported safe spaces for women and children have closed this year because of funding cuts.

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Research Article

Post-stroke epilepsy in Oman: Prevalence, clinical profile, and treatment outcomes

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ABSTRACT

Introduction: Post-stroke epilepsy (PSE), defined as unprovoked seizures occurring more than seven days after stroke onset, is a frequent neurological complication with variable incidence and outcomes. This study estimated the prevalence of PSE among acute stroke patients, described its types, assessed treatment adherence, and outcomes.

Method: A retrospective analysis was conducted on acute stroke patients diagnosed with PSE at Sohar Hospital from January 2023 to December 2024.

Results: PSE was identified in 7.3% of acute stroke patients. Haemorrhagic stroke accounted for 86.7% of cases, while ischaemic stroke represented 13.3%. Generalised seizures were most common (63.3%), followed by focal seizures (26.7%); 10.0% remained unclassified. All patients were treated with antiseizure medication (ASM) monotherapy—levetiracetam (90%) or carbamazepine (10%). Overall adherence to ASM was 96.7%, with no significant difference between levetiracetam and carbamazepine (p = 0.07). Seizure control was achieved in 90.0% of patients, partial control in 10.0%, and no patients had poor control. Levetiracetam achieved higher control rates than carbamazepine (96.3% vs. 33.3%, p = 0.0006). Gender was not significantly associated with seizure control (p = 0.238).

Conclusion: PSE in this study mainly followed haemorrhagic stroke and presented mainly with generalised seizures. Monotherapy with levetiracetam was associated with better seizure control, but due to the small sample size, a larger study is needed to draw firmer conclusions.

Keywords: post-stroke epilepsy, levetiracetam, carbamazepine, seizure control, Oman.

Introduction

Post-stroke epilepsy (PSE) is defined as unprovoked seizures occurring more than seven days after stroke onset and is a common neurological complication of both ischaemic and haemorrhagic strokes.[1] Large stroke, cortical involvement, haemorrhagic stroke or haemorrhagic transformation, and early seizures are predictors of post-stroke epilepsy.[2]

The incidence of early seizures (within seven days of stroke) ranges from 2% to 7%, while late seizures, which define PSE, occur in approximately 2–4% of stroke survivors within the first few years.[3] A pooled meta-analysis showed a cumulative incidence of 10% for late seizures.[4] Notably, haemorrhagic strokes pose a significantly higher risk than ischaemic ones. However, some studies showed a higher incidence among ischaemic strokes.[5]

PSE accounts for 30–50% of new-onset epilepsy in older adults, making it the most common cause of epilepsy in individuals over 60 years.[6] The majority of seizures after stroke are focal-onset, especially in cortical strokes, and may secondarily generalise.[7] Generalized-onset seizures and non-convulsive status epilepticus occur less frequently but are associated with worse outcomes.[8] In a Saudi study involving 1,235 stroke patients, post-stroke epilepsy occurred in 13.5%.[9]

The mainstay of treatment is monotherapy with antiseizure medications. Levetiracetam, valproate, and carbamazepine are commonly used.[10] Levetiracetam is favoured for its favourable side effect profile, particularly in the elderly. In a recent controlled trial conducted in the USA, about 55% of patients started on levetiracetam; 12% required polytherapy over time. Newer antiseizure medications such as perampanel improved seizure control with acceptable tolerability in patients with PSE.[11]

Seizure control is generally achievable in most PSE patients with appropriate treatment. However, older age, status epilepticus, and non-convulsive status epilepticus are associated with poor prognosis and increased mortality.[7] A large cohort study found that PSE patients have a higher risk of death and cognitive decline compared to stroke patients without epilepsy.[12]

Older adults are more likely to develop PSE and to have poorer seizure control, likely due to comorbidities and reduced antiseizure medication tolerability.[3] While male gender has been identified as a modest risk factor for post-stroke seizures, it has no consistent influence on treatment compliance or seizure control.[10]

In this study, we aimed to estimate the prevalence of PSE, its types, its control, and identify seizure control predictors.

Method

We conducted a retrospective study at Sohar Teaching Hospital in Sohar, North Al Batinah Governorate, Oman, in the Department of Medicine, Stroke Unit.

Admitted Omani stroke patients aged ≥18 years, who developed PSE at Sohar Hospital between January 2023 and December 2024. The study excluded those with a known epilepsy prior to the stroke, those with a history of significant head trauma, a neurosurgical intervention, and patients with chronic brain disorders.

A total coverage method was employed, involving all eligible adult stroke patients during the study period, the sampling unit being individual patients diagnosed with PSE.

Potential participants were identified through authorised access to the electronic medical records (EMR) of Sohar Hospital. In cases requiring supplementary information, the Co-Principal Investigator facilitated patient contact.

Data were collected from the EMRs using a pre-designed structured questionnaire.

Ethical approvals were obtained from the bioethics and safety committee of the College of Medicine, National University of Science and Technology, the Ministry of Health Ethical Committee, and the institutional review board at Sohar Hospital.

Descriptive statistics were used to describe the sample and calculate prevalence. Inferential statistics included correlation tests for continuous variables. Chi-square and Fisher's exact test were used for categorical data associations. A level of $p < 0.05$ was considered statistically significant. Data were analysed using IBM SPSS Statistics software.

All data collection forms were complete, with no missing information.

Results

Demographic and clinical characteristics

Table 1 presents the baseline demographic and clinical characteristics of the participants. Of 411 patients screened, 30 patients who developed post-stroke epilepsy were enrolled in this study, resulting in a prevalence of 7.3%. The median age was 55.5 years (Range = 18-83). The types of strokes leading to PSE were as follows: 26 (86.7%) of PSE cases occurred in haemorrhagic strokes, and four (13.3%) in ischaemic strokes. In terms of seizure classification, generalised seizures were the most frequently observed, affecting 63.3% of patients (n=19). Focal seizures occurred in 26.7% (n=8), while 10.0% (n=3) of cases remained unclassified. Early onset of seizures was detected in 17(56.7%) and late onset in 13 (43%)

Table 1. Demographic and clinical characteristics of post-stroke epilepsy cases

Characteristics	n (%)
Age group (years)	
< 40	8 (26.7)
40-49	2 (6.6)
50-59	5 (6.6)
60-69	6 (20.0)
≥ 70	9 (30.0)
Sex	
Male	14 (46.7)
Female	16 (53.3)
Risk of Stroke	
Hypertension	20 (66.7)
Diabetes mellitus	10 (33.3)
Cardiac disease	9 (30.0)
Types of strokes	
Haemorrhagic	26 (86.7)
Ischaemic	4 (13.3)
Types of PSE	
Generalised	19 (63.3)
Focal	8 (26.7)
Unclassified	3 (26.7)
Onset of stroke	
Early	17 (56.7)
Late	13 (43)
Size of hemispheric ischaemic stroke	
Large	2 (50) out of ischaemic stroke
Small to moderate	2 (50) out of ischaemic stroke

Table 2. Type treatment, mode of therapy, adherence to treatment among the studied patients

Parameter	n (%)
ASM choice	
Levetiracetam	27 (90.0)
Carbamazepine	3 (10.0)
Mode of therapy	
Monotherapy	30 (100.0)
Polytherapy	0 (0.0)
Adherence to treatment	
Adherent	29 (96.7)
Not adherent	1 (3.3)
Seizure Control	
Well controlled	27 (90.0)
Partially controlled	3 (10.0)
Poorly controlled	0 (0.0)

Antiseizure medication (ASM) choice and mode of therapy

Levetiracetam was the choice for 27(90%) patients and carbamazepine for three (10%) patients. The details of ASM employed in this group of patients is shown in Table 2.

Patient adherence to ASM

Most (96.7%, 29 of 30) adhered to their ASM. Adherence to carbamazepine was 100% (3/3) compared to 96.3% (26 of 27) adherence to levetiracetam. There was no significant difference between the groups in terms of adherence to treatment (p= 0.07)

Seizure control among patients

Seizures were well controlled in 90.0% (n=27) of patients on monotherapy, partially controlled in 10.0% (n=3), and none were poorly controlled. In the levetiracetam group, 96.3% (26 of 27) were well controlled, and 5.7% (1/27) were partially controlled. In the carbamazepine group, 33.3% (1 of 3) were well controlled, and 66.3% (2 of 3) were partially controlled. Seizure control was better with levetiracetam (p-value of 0.0006).

Discussion

In this study, the prevalence of PSE was 7.3%, which lies within the reported range of late seizures following stroke, though it is slightly lower than the 10% pooled incidence found in a previous meta-analysis.[5]

The predominance of PSE following haemorrhagic stroke (86.7%) compared with ischaemic stroke (13.3%) is consistent with prior studies highlighting the higher epileptogenic potential of haemorrhagic lesions.[2,4] This finding also aligns with earlier reports from the region, such as the Saudi cohort, in which haemorrhagic stroke was a major contributor to post-stroke seizures.[11]

Generalised seizures were the most common presentation in our cohort (63.3%), exceeding the proportion of focal-onset seizures (26.7%). This distribution contrasts with prior literature indicating focal seizures as the dominant type in PSE[9] The higher proportion of generalised seizures in our sample may reflect differences in stroke subtype distribution, lesion location, or seizure classification limitations due to incomplete documentation in some cases.

Levetiracetam was prescribed in 90% of cases. The preference for levetiracetam mirrors patterns seen in European and North American cohorts,[13] likely due to its favourable tolerability profile in older adults.

The higher prevalence of PSE among haemorrhagic stroke patients underscores the importance of targeted seizure surveillance and early ASM initiation in this subgroup.[2,4]

Overall, our findings contribute new data on the prevalence and clinical characteristics of PSE in Oman. Future studies with larger numbers are warranted to confirm these results, identify additional prognostic factors, and explore the potential role of newer ASMs.

Conclusion

PSE in this study predominantly followed haemorrhagic stroke and presented mainly with generalised seizures. Monotherapy with levetiracetam was associated with high adherence and seizure control. These findings highlight the need for vigilant seizure monitoring in haemorrhagic stroke survivors and support the preferential use of levetiracetam in PSE management in similar settings, but due to the small sample size, a larger study is needed to draw firmer conclusions.

Availability of data: The datasets used are available from the corresponding author upon reasonable request.

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Conflict of interests: None

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Research Article

Non-communicable diseases among adolescents in Kilombero, Tanzania: Knowledge, attitudes, and practices

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ABSTRACT

Introduction: Non-communicable diseases (NCDs) include heart disease, cancer, and diabetes mellitus. Globally, NCDs account for approximately 74% of all deaths. Although once considered diseases of adults, recent evidence shows that NCDs are increasingly affecting younger populations. The study assessed knowledge, attitudes, and practices related to risk factors for NCDs among adolescents in Kilombero, Tanzania.

Method: A cross-sectional study was conducted in Ifakara, Tanzania, involving 448 students from 14 secondary schools. The study was conducted for a period of nine months (January – September, 2024). Data were collected using a semi-structured questionnaire capturing knowledge and awareness of NCD risk factors. They were analysed in SPSS to determine risk ratios for developing NCDs, and chi-square tests were used to examine associations between dependent variables (NCD indicators) and independent variables (knowledge and awareness).

Results: Most participants (n = 371) were under 18 years old. Awareness was highest for diabetes mellitus (24%). Regarding perceived causes of NCDs, 26.8% attributed them to infections and 26.6% to heredity, while 10.7% did not know. Most participants (62.1%) lacked knowledge of the importance of regular blood sugar monitoring. Diabetes was ranked the most recognised NCD (24.6%), followed by cancer (20.5%) and hypertension (19.4%). BMI classifications showed underweight (16.6%), obesity (12.8%), and overweight (11.3%). Significant associations were found between NCD indicators and stress (p=0.015), alcohol use and age (p=0.025), obesity and lack of exercise (p=0.038), and geographic location (p=0.000).

Conclusion: The findings demonstrate emerging awareness of NCDs among adolescents. Strengthened efforts in awareness, prevention, and early behavioural interventions are urgently needed to reduce NCD risks in young populations, especially in low-resource settings.

Keywords: awareness, knowledge, students, non-communicable diseases, Tanzania

Introduction

Non-communicable diseases (NCDs), principally cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes mellitus, account for approximately 70% of global deaths and represent one of the most pressing public health challenges worldwide.[1,3] Cardiovascular diseases alone contribute about 32% of all NCD-related mortality, followed by cancers (17%), chronic respiratory diseases (7%), and diabetes (3%).[1,3] These conditions are largely driven by modifiable behavioural risk factors, including tobacco use, harmful alcohol consumption, unhealthy diets, and physical inactivity, which increasingly emerge early in life.[1,4]

In sub-Saharan Africa (SSA), the increasing prevalence of NCDs has become a major public health concern. However, the true burden remains poorly documented because of weak surveillance systems and limited population-based research.[4,8] Adolescents in low-resource settings are particularly vulnerable to NCDs due to socio-economic barriers, limited access to accurate health information, and restricted NCD preventive health services that negatively influence their health-seeking behaviours. Since habits formed during adolescence strongly shape adults' health outcomes, early awareness of NCDs' risk factors is a crucial precedence.

Tanzania reflects this wider regional trend, with increasing rates of hypertension, diabetes mellitus, cardiovascular diseases, cancers, and obesity.[9–11] The combined effects of obesity, DM, and hypertension significantly contribute to the country's cardiovascular disease burden.[6,12] Although adolescents are not considered a high-risk population, emerging evidence highlights a growing prevalence of unhealthy behaviours, including physical inactivity, alcohol consumption, tobacco use, intake of sugary drinks, and poor dietary patterns.[13] Nevertheless, adolescents continue to be underrepresented in research and policy initiatives aimed at addressing NCDs.

With over 5.4 million adolescents enrolled in secondary schools in Tanzania,[14] this population represents an early entry point for NCDs awareness and prevention. Understanding their knowledge, attitudes, and awareness of NCD risk factors is essential for designing effective school-based interventions. This study therefore assessed adolescents' awareness of NCD risks, types, preventive behaviours, and knowledge of biometric indicators in Kilombero, Tanzania, to inform strategies that promote healthier future generations.

Method

Study area and design

This cross-sectional study was conducted in Kilombero District, Morogoro Region, Tanzania, with a population of 290,424 according to the 2022 national census.[14] The study was conducted over nine months (January – September, 2024). It involved secondary school students from 14 schools across Ifakara Township and nearby urban, peri-urban, and rural settings. Schools were grouped by location, and students were categorised by class levels (ordinary level, advanced level), study streams (science, commerce, or arts), mode of transport to school, type of physical activity at home, dietary habits, school type (day or boarding), and ownership (public or private). In addition, the study examined adolescents' knowledge, attitudes, and practices regarding non-communicable diseases as dependent variables, while independent variables comprised contextual and behavioural factors, including household characteristics, lifestyle behaviours, school environment, and sources of health information

Sampling and data collection

Ethical approval was obtained from the St. Francis University College of Health and Allied Sciences Institutional Review Board (SFUCHAS-IRB), and permission was granted by local authorities. Study teams visited each school to introduce the study, randomly selected participants, and obtained informed consent. Trained enumerators collected anthropometric data using World Health Organization guidelines for NCD risk assessment.[16] A semi-structured questionnaire was pretested and administered to students. Each school contributed 32 students, randomly selected from year 3 and 4 of secondary school, or from year 5 and 6 of secondary school education, where applicable. A total of 448 students participated in the study.

Inclusion and exclusion criteria

Students were eligible if they had no prior diagnosis of an NCD. Excluded participants included those with known NCDs, school dropouts, and students in years 1 and 2 of secondary education. Participation was voluntary, and only students with signed consent were included.

Data analysis

Data were coded in Microsoft Excel and analysed using SPSS version 20. Descriptive statistics summarised

participants' socio-demographic characteristics and levels of knowledge, attitudes, and practices (KAP) related to NCDs. Associations between categorical variables were assessed using chi-square tests. Variables with $p < 0.20$ at bivariate analysis were entered into multivariable logistic regression models to identify factors independently associated with adequate NCD knowledge, positive attitudes, and appropriate practices. Results are presented as adjusted odds ratios (AORs) with 95% confidence intervals (CIs) and p-values. Model fit and explained variation were assessed with a statistical significance set at $p < 0.05$.

Results

A total of 448 secondary school students aged 15–21 years from 14 schools in Ifakara participated in the study. The distribution of respondents across schools was balanced, with slightly more male than female participants. Most students were enrolled in social science subjects. The demographic data of the participants are presented in Table 1.

Knowledge of NCD types and diagnostic measures

DM was the most frequently mentioned NCD, followed by cancer and hypertension, whereas stroke was the least mentioned. A small proportion (4.7%) incorrectly identified HIV as an NCD. When asked about diagnostic units, most students lacked knowledge of blood sugar readings, with 62.1% unable to interpret glucose values. Similarly, the majority (63.2%) did not recognise body mass index (BMI) as an important indicator for overweight or obesity. Only 36.8% demonstrated awareness of BMI as a key diagnostic measure (Table 2).

Awareness of NCD risk factors, aetiology, clinical signs, and information sources

Lack of physical activity was the most frequently reported risk factor for NCDs (32.8%), followed by alcohol use (22.5%). When ranking prevalent NCDs, students identified DM as the most common (24.6%), followed by cancer (21.0%), with hypertension ranked lowest (11.8%). Regarding perceived causes of NCDs, 26.8% attributed them to infections, 26.6% to heredity, while 10.7% were unsure. Weight loss was the most recognised clinical sign (28.8%), followed by headaches (21.0%), whereas paralysis and lethargy were rarely mentioned. Media sources were the primary source of NCD information (40.6%), followed by healthcare workers (28.8%), as shown in Table 3.

Table 1. Respondents' socio-demographic characteristics

Demographic factors	Characteristics	Frequency, n (%)
Location	Peri-urban	141 (31.5)
	Rural	153 (34.2)
	Urban	154 (34.4)
Age (years)	Above 18	77 (17.2)
	Under 18	371 (82.8)
Gender	Female	215 (48.0)
	Male	233 (52.0)
Class	Ordinary level	320 (71.4)
	Advanced level	128 (28.6)
Opted subjects	Others opted subjects	80 (17.9)
	Natural sciences	107 (23.9)
	Social sciences	261 (58.3)

Table 2. The distribution of types, causes and knowledge on units to diagnose NCD

Category	NCD Type	Frequency, n (%)
Types of NCD	Cancer	92 (20.5)
	Coronary Heart Disease	65 (14.5)
	DM	110 (24.6)
	HIV - AIDS	21 (4.7)
	Hypertension	87 (19.4)
	Others	37 (8.3)
	Stroke	36 (8.0)
Category	**Causes of NCD**	**Frequency, n (%)**
Aetiology of NCD	Bewitched	94 (21.0)
	Don't know	48 (10.7)
	Infections	120 (26.8)
	Inherited	119 (26.6)
	Radiations	67 (15.0)
Category	**Units used in NCD diagnosis**	**Frequency, n (%)**
Body Mass Index	Yes	165 (36.8)
	No	283 (63.2)
Blood sugar	Yes	170 (37.9)
	No	278 (62.1)
Blood pressure	Yes	236 (53.7)
	No	212 (47.3)

Physical activity and BMI distribution

Students engaged in various physical activities after school, including cycling (20.3%), athletics (16.6%), and farming (11.3%). Most participants had a healthy BMI (20.3%), although notable proportions were underweight (16.6%), obese (12.8%), or overweight (11.3%). BMI was compared by age, sex, education level, and school location. Healthy BMI categories were more common among students in urban schools than those in rural or peri-urban settings, as shown in Table 4.

Table 3. Respondent awareness on NCD risk factors, clinical signs and source of information

Factors considered on NCD	Category	Frequency, n (%)
Associated risk factors	Alcoholism	101 (22.5)
	Obesity	71 (15.8)
	Others	59 (13.2)
	Stress	70 (15.6)
	Lack of physical exercises	147 (32.8)
Respondent ranking	Cancer	94 (21.0)
	CHD	82 (18.3)
	Diabetes mellitus	110 (24.6)
	Hypertension	53 (11.8)
	Others	43 (9.6)
	Stroke	66 (14.7)
Aetiology	Bewitched	94 (21.0)
	Don't know	48 (10.7)
	Infections	120 (26.8)
	Inherited	119 (26.6)
	Radiations	67 (15.0)
Clinical signs associated	Blurred vision	75 (16.7)
	Headache	94 (21.0)
	Lethargy	37 (8.3)
	Don't know	76 (17.0)
	Paralysis	37 (8.3)
	Weight loss	129 (28.8)
Source of information	Taught in class	82 (18.3)
	Media (radio and social media)	182 (40.6)
	Others	55 (12.3)
	Physicians	129 (28.8)

Furthermore, multivariable logistic regression identified key factors associated with adolescents' knowledge, attitudes, and practices (KAP) regarding NCDs. Adequate NCD knowledge was significantly more common among females (AOR = 1.38; 95% CI: 1.01–1.89), adolescents aged 16–19 years (AOR = 1.67; 95% CI: 1.14–2.45), and those who had received prior NCD education (AOR = 2.08; 95% CI: 1.41–3.07). This model explained 29% of the variation in knowledge (R^2 = 0.29). Positive attitudes towards NCD prevention were independently associated with adequate knowledge (AOR = 2.54; 95% CI: 1.71–3.77) and physical activity (AOR = 1.89; 95% CI: 1.25–2.85), accounting for 24% of the variation (R^2 = 0.24). Appropriate NCD-related practices were strongly associated with positive attitudes (AOR = 2.76; 95% CI: 1.84–4.13) and adequate fruit and vegetable intake (AOR = 1.63; 95% CI: 1.10–2.43). This model explained 31% of the variation. All models showed acceptable goodness-of-fit ($p > 0.05$). In addition, the results of the multivariable analysis are displayed in Table 5.

Discussion

This study examined knowledge, attitudes, and practices regarding NCDs among secondary school students in Kilombero, Tanzania. Adolescents were chosen as the focus group because this developmental stage is pivotal in shaping lifelong behavioural patterns, making it a critical period for primary prevention of NCDs.[1,11,17] As NCDs continue to rise across Tanzania and other low- and middle-income countries, understanding how young people perceive NCD risks is essential in guiding earlier NCD prevention initiatives.[2–5]

Although NCDs have historically been viewed as conditions of adulthood, younger populations are increasingly becoming vulnerable due to early adoption of unhealthy behaviours, rapid urbanisation, dietary changes, alcohol and tobacco use, and physical inactivity.[6,9,12,17] Limited access to accurate health information also contributes to this trend.[7,31–33] This study explored students' awareness of NCD types, causes, symptoms, and risk factors, as well as their main sources of information. A school-based sample allowed for broad representation across urban, peri-urban, and rural settings, aligning with similar studies conducted in Tanzania, Kenya, and internationally.[1,11,23]

Table 3. Relation of other health status factors of the respondents to self-medication

Variable	Category	BMI interpretation				Total
		Normal weight	Obesity	Overweight	Underweight	
Age (years)	Above 18	28	16	13	20	77
	Under 18	121	78	70	102	371
Sex	Female	77	40	39	59	215
	Male	72	54	44	63	233
School level	Advanced	43	29	27	29	128
	Ordinary	106	65	56	93	320
School location	Peri-urban	51	24	25	41	141
	Rural	41	39	30	43	153
	Urban	57	31	28	38	154

Key to BMI: Underweight <18.5, Normal weight 18.5 – 24.9, Overweight 25.0 – 29.9, Obesity ≥ 30

Table 5. The results of the multivariable analysis on the factors associated with knowledge of respondents on NCD

Risk factors	Associated factors	p - value
Stress	Age susceptibility	0.015
Alcoholism	Age susceptibility	0.025
	Course of study	0.000
Obesity	Age and lack of exercise	0.038
Lack of exercise	Location, sex and age	0.000
Gender	Female	215 (48.0)
	Male	233 (52.0)
Class	Ordinary level	320 (71.4)
	Advanced level	128 (28.6)
Opted subjects	Others opted subjects	80 (17.9)
	Natural sciences	107 (23.9)
	Social sciences	261 (58.3)

Consistent with findings from other adolescent studies, DM emerged as the most commonly recognised NCD, and students demonstrated awareness of some of its symptoms, such as weight loss and frequent urination.[1,11,17] However, national and regional data show that cardiovascular diseases remain the leading contributors to NCD mortality in Tanzania, highlighting gaps in adolescent understanding of the broader NCD spectrum.[3,4,12] Students identified multiple perceived causes of NCDs, including lifestyle, heredity, and infections, which reflect mixed community knowledge and underscore the need for clearer public health messaging.[5,10,27] Physical inactivity, poor diet, obesity, and alcohol use were commonly cited risk factors, consistent with evidence that several lifestyle risks tend to cluster rather than occur independently.[13,22,23]

Mass media and social media were major sources of NCDs information, echoing findings from studies showing that digital platforms strongly influence adolescent health behaviours.[7,21,29,31–33] Given adolescents' strong engagement with these platforms, integrating digital health communication into NCDs awareness programmes could enhance reach and impact. Overall, the findings highlight the urgent need to strengthen school-based NCDs education, community engagement, and youth-friendly communication strategies to reduce future NCDs risks among adolescents in Tanzania.[5,18,24,27]

Conclusion

Adolescents in Kilombero show partial awareness of NCDs, highlighting the need for strengthened early health education. School-based NCD education, community engagement, and further research on adolescent behaviours are essential to improve understanding, promote healthier lifestyles, and support national efforts to reduce future burden of NCDs.

Study Limitations: This study relied solely on questionnaires and did not include clinical measurements to validate self-reported information. In addition, data were collected in a limited geographical area and may not represent all adolescents in Morogoro Region or Tanzania.

Despite these limitations, the study provides valuable insights for raising awareness among young people and informing policy discussions on adolescent health.

Conflict of Interest: none

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Informed Consent: Most participants were under 18 years; therefore, teachers acted as guardians and signed consent forms on their behalf. Students' identities were fully anonymised using unique codes known only to the researchers, and no personal information was disclosed.

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Improvement of haemoglobin levels with catfish floss among teenage girls in Semarang City, Central Java, Indonesia

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ABSTRACT

Introduction: Among teenage girls in Indonesia, the incidence of anaemia rose from 37.1% in 2013 to 48.9% in 2018. The main cause is iron deficiency, aggravated by menstruation and by insufficient dietary iron. Catfish is high in protein and iron. This study aimed to compare the effects of catfish floss on haemoglobin (Hb) levels among teenage girls in Semarang, Indonesia.

Method: Using a purposive sampling technique, 102 girls aged 13 to 15 years from two junior high schools were assigned to the intervention and control groups, each with 51 participants. Girls with chronic diseases such as cancer, spleen, or kidney-related problems were excluded. The intervention group received 30 grams of catfish floss twice daily for two months. A pre-test and post-test Hb levels in the groups were analysed.

Results: The Hb level in the intervention group increased from 11.88 g/dL to 12.88 g/dL ($p < 0.001$), and the incidence of anaemia decreased by 37.2%. There was a small non-significant ($p = 0.132$) decline of Hb in the control group to 12.23 g/dL from 12.51 g/dL, and anaemia cases increased by 2%.

Conclusion: This study found a significant increase in Hb levels in the intervention group. The catfish floss had an effect, even when not mixed with other nutrients, on the prevention of anaemia.

Keywords: catfish, anaemia, haemoglobin, teenage girls, Indonesia

Introduction

According to the most recent Riskesdas survey data, anaemia is a major health issue among Indonesian teenage girls, with prevalence rising from 37.1% in 2013 to 48.9% in 2018.[1] Because of blood loss during menstruation, teenage girls are regarded as high-risk for iron deficiency anaemia.[2] The World Health Organization (WHO) defines anaemia as a haemoglobin (Hb) level of less than 12.0 g/dL in a girl aged 12 to 14 years and in a non-pregnant woman aged 15 to 18.[3] Anaemia in teenage girls can result in poor academic achievement, impaired immunity, and diminished physical fitness, leading to an adverse effect on athletic performance and productivity.[3]

Adolescent females are at risk of anaemia due to several factors, including low socioeconomic status, heavy menstrual loss, poor education, and inadequate consumption of iron, folic acid, and protein.[3–6] The importance of eating a balanced diet should be emphasized in any efforts to prevent anaemia in teenage girls.[6,7] Locally produced food with a high iron content can also help address this issue. With a production of 116,114 tons in 2022, catfish is abundant in Indonesia, reasonably priced, and high in iron and protein. Additionally, unsaturated fatty acids found in catfish may improve immunological function.[2]

Catfish (*Clarias* spp.) floss (Abon lele) is a high-protein food product preserved through cooking and drying. The final product is dried fish meat fibre with a low moisture content (generally <10%), making floss relatively stable against microbiological spoilage, easy to store, and has a long shelf life without refrigeration.[8] In Africa, it is often called African catfish (*Clarias gariepinus*), a species biologically very similar to the catfish used in Southeast Asia. Nigeria, for example, is the largest catfish producer and is ranked among the top 10 in the world in several FAO reports. Therefore, the availability of raw materials for floss is very high, making floss an alternative value-added product.

Studies on catfish-derived products have demonstrated encouraging results in treating anaemia. The potential of fish-based products enhanced with iron-rich components to treat anaemia, especially in pregnant and reproductive-age women, has been investigated in recent studies.[9] Reports also suggest that catfish flour and moringa leaves significantly affect Hb levels in anaemic pregnant women.[10]

However, research on catfish floss (Abon lele) without additional nutrient-rich ingredients remains limited. Most studies have focused on catfish floss combined with other ingredients, without specifically assessing its effects alone. This study aimed to bridge this gap by evaluating how teenage girls' Hb levels are affected by catfish floss consumption.

Method

One hundred and two girls aged 13 to 15 years from two junior high schools in Semarang City were included in this study: 51 in the intervention group and 51 in the control group. The sampling technique used was purposive sampling, a nonprobability sampling method, to select participants based on specific criteria. The sample was collected from two different junior high schools, one as the intervention group and the other as the control group. The sample was selected using the inclusion criteria, namely junior high school teenage girls not taking vitamins/ other supplements, and not in their menstrual period. Those with chronic diseases such as cancer, spleen, or kidney-related problems were excluded.

A paired-samples t-test was used to compare Hb levels before and after the intervention within each group. An independent t-test was then used to compare the post-intervention Hb levels in the two groups. Hb levels were measured using a Haemoglobin Analyzer (HemoCue, Hb 201+). A questionnaire was given to the girls to assess their knowledge of anaemia. The intervention group received 30 grams of catfish floss twice daily for two months.

Ethical permission to conduct this work was given by the Health/Medical Research Bioethics Committee, Faculty of Medicine, Sultan Agung Islamic University, Semarang (250/VII/2024/Bioethics Committee).

Results

This research shows that in the intervention group, the number of anaemic girls decreased, whereas in the control group, the number of girls with anaemia increased (Table 1).

Based on the normality test with Kolmogorov-Smirnov, it is known that the pretest and post-test data of Hb levels in both groups show normal data distribution (p-value>0.05). So, we analyse differences in pretest and post-test data in each group using the Paired Simple T-test. The intervention group t-test presented a p-value of 0.000(<0.05) (Table 2), indicating a significant rise in the Hb levels.

The differences in changes in Hb level between the intervention group and the control group were significant (p-value = 0.014) (Table 3) indicating a beneficial effect of catfish floss.

Table 1. Frequency distribution of anaemia in the pre- and post- intervention and control groups (N=51)

Group	Anaemia	
	Pre-intervention n (%)	Post-intervention n (%)
Intervention Group	27 (52.9)	8 (15.7)
Control Group	15 (29.4)	16 (31.4)

Table 2. Analysis of the differences in haemoglobin levels between pre-test and post-test in the intervention and control groups

Haemoglobin levels	Mean/Median	p-value (Paired Simple T-Test)
Intervention Group (Normalities test: 0.200)		
Pre-test	11.88/11.88	0.000
Post-test	12.88/13.00	
Control Group (Normalities test: 0.200)		
Pre-test	12.51/12.50	0.132
Post-test	12.23/12.20	

Table 3. Analysis of haemoglobin level between the intervention and control groups

Haemoglobin levels	Mean/Median	p-value (independent T-test)
Intervention Group Post-test	12.88/13.00	**0.014**
Control Group Post-test	12.23/12.20	

Discussion

Table 1 indicates that anaemia in the intervention group decreased. The number of anaemic students in the control group increased, but only marginally. Similar findings were reported by Hastuti et al., who found that the administration of crispy catfish and red beans improved Hb levels in the intervention group.[2] Haemoglobin consists of iron (Fe) bound to porphyrin and globin, so adequate iron intake is essential.[3] Iron from animal products is more easily absorbed because it is not dependent on duodenal pH and is not affected by inhibitors such as phytates and polyphenols.[11] Therefore, catfish, which is high in protein and iron, is one of the food products capable of addressing anaemia.[2,12]

Data in Table 2 show that in the intervention group, Hb levels increased significantly after catfish floss use. A similar study found that administering catfish geblek (traditional food made from catfish flour) and moringa leaves had an effect on haemoglobin levels in pregnant women with anaemia at the Winong Kemiri Community Health Center in Purworejo, with a p-value of 0.000 (0.05) based on the post-test score, which increased compared to the pre-test score.[9]

Table 3 presents the post-test results for both groups. A p-value of 0.014 indicated a significant difference in Hb levels between the intervention and control groups. A comparable intervention that included tuna fish with chayote leaf purée, moringa leaf purée, and catfish dumplings also showed an increase in Hb levels in teenage girls.[13]

Catfish is one of the most popular types of fish in Indonesia and in many other countries. It is delicious, high in nutritional value, and easily combined with other ingredients. Its relevance to African countries is strong because: Catfish is a major aquaculture commodity in many African countries; floss products are suitable for contexts with minimal cold chain infrastructure; they can play a role in improving food security and nutritional status; they have economic prospects; and they are culturally accepted. The item on p59 describes how fish floss is prepared in South Sudan.

Research has shown that biscuits made with catfish flour and spinach (45g:15g) meet the nutritional requirements set by the Indonesian National Standard (SNI) and improve carbohydrate and iron provision.[14] Another formula, consisting of catfish, corn, and pisang raja (plantain) in a 30%:25%:45% ratio, has been proven to be an alternative solution for anaemia prevention in teenage girls.[15]

Conlusion

This study demonstrates that a single-dose intervention of catfish floss, without formulation with other nutrients, significantly increases the Hb levels in teenage girls. It is advised that catfish floss be marketed as a nutritional supplement to help prevent and lessen anaemia in teenage girls.

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A giant-sized pilocytic astrocytoma mimicking a brain abscess: A case report and literature review

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ABSTRACT

Pilocytic astrocytoma (PA) is a rare but common low-grade glioma affecting children and young adults. It has a favourable prognosis and a high survival rate with appropriate management. Despite slow growth, PA often presents with significant symptoms due to its tendency to reach a large size, especially in paediatric patients, where compensatory mechanisms can delay detection. PA mimics a brain abscess. However, a brain abscess presents as an intracerebral infection localised to a specific area, which frequently develops into collections of pus surrounded by a well-demarcated, vascularised capsule. With advanced MRI imaging, PA tumours show free diffusion-weighted imaging with a high Apparent Diffusion Coefficient (ADC) value, while an abscess shows restricted diffusion-weighted imaging with a low ADC. This case report describes a six-year-old male child who presented with fever, focal seizures, and altered consciousness. CT scan results revealed a right parietal mass that was consistent with a PA and hydrocephalus. Even though this case report highlights the value of neuroimaging for PA diagnosis, the unique presentation displays challenges in managing PA, emphasizing the importance of timely intervention to optimize neurological outcomes.

Keywords: pilocytic astrocytoma, brain abscess, CT scan, paediatric, South Sudan

Introduction

Pilocytic astrocytoma (PA) most commonly occurs in paediatric patients. It is a type of glioma that accounts for 15.6% of central nervous system (CNS) tumours in children.[1] Even though PA can arise anywhere in the CNS, the most frequent sites in descending order are cerebellum, supratentorial compartment, optic pathway, hypothalamus, brainstem, and the spinal cord, with 42%, 36%, 9%, 9%, and 2%, respectively.[2] In children, the most affected site is the cerebellum (6%).[2] It is mainly found in children aged 5 to 14 years, with the highest incidence between 6 and 8 years, and is slightly more common in males.[2,3,4] The ten-year survival rate exceeds 85-95%.[1]

Neuroimaging (CT scan and MRI) plays a crucial role in diagnosis, treatment, and monitoring. CT scanning shows a hypodense cystic component, an isodense/hypodense nodule, enhancement after contrast, and possible calcification. MRI (T1) shows a cyst isodense with CSF and a nodule as iso- to hypodense to

grey matter. However, MRI (T2/FLAIR) shows a cyst as hyperdense (like CSF) and a nodular hyperdense. Post-contrast T1: Dense, homogeneous enhancement of the mural nodule (and sometimes cyst wall). Diffusion Weight Imaging (DWI) and Apparent Diffusion Coefficient (ADC) show a high signal (bright) on ADC maps (no restricted diffusion).

In contrast a brain abscess (BA) appears on CT scan as a rim-enhancing lesion with a central low-density (necrotic/fluid) area with extensive surrounding oedema. MRI (T1) demonstrates a hypodense central core with a capsule that may show an isodense signal. MRI (T2/FLAIR) shows a bright central core an isodense capsule and significant oedema. Post-contrast T1 reveals a thick, irregular, "ring-like" enhancement of the capsule. DWI/ADC: Restricted diffusion (dark) in the central core (pus), contrasting with the bright ADC signal of PA.[5] In resource-limited settings, CT scan can be used for screening purposes because it is fast, accessible, and detects hydrocephalus. On the other hand, MRI has high resolution but is expensive and can be used after screening.

Complete surgical removal is the gold standard treatment.[6] Total resection (TR) is usually the preferred approach, with a ten-year survival rate of about 95%,[7] but others use minimally invasive techniques and focus on hydrocephalus management.[8] However, craniotomy has challenges ranging from complex anatomy and proximity to vital structures: the cerebellum is adjacent to the brainstem and cranial nerves, and the risk of damage to these structures is very high. When the tumour is large, and part is left behind, the risk of recurrence increases. Postoperative neurological deficits include gait ataxia, sensory disturbances, cranial nerve palsies, dysphagia, Cerebellar Mutism Syndrome (Posterior Fossa Syndrome), hydrocephalus, and CSF leaks. There are also intraoperative limitations involving patient positioning, intraoperative imaging, a lack of a clear field of view, and an inability to accurately assess the extent of tumour infection and bleeding.[7,9,10]

Hydrocephalus can be managed with an external ventricular drain (EVD) insertion, ventriculoperitoneal shunt (VP shunt), or ventriculostomy.[11] Radiotherapy and chemotherapy should be considered for recurrent or progressive tumours involving the cerebellar peduncle or the brainstem. Patients may have permanent cerebellar dysfunction and cognitive disturbance after surgery.

Case report

A six-year-old male was referred from Yafa paediatric centre to Al Sabah Children's Hospital with a persistent high-grade fever of four weeks' duration. He was previously healthy with normal developmental milestones and had been fully immunised, including BCG for tuberculosis. The fever was temporarily relieved by diclofenac, associated with abnormal body movements characterized by sustained flexion of the right arm and numerous daily episodes lasting less than one minute over the previous three weeks. He became unconscious two days prior to admission and was unresponsive to voice and touch. He had no history of head trauma, vomiting, headache, family history of seizures, weight loss, night sweating, cough, upper respiratory or gastrointestinal symptoms, and no contact with a known TB patient. Moreover, there was no history of preceding upper respiratory and gastrointestinal symptoms.

On arrival, he was looking ill, in moderate respiratory distress (Respiratory Rate=34/min) with a Glasgow Coma Scale (GCS) of 6/15. The hospital does not have an Intensive Care Unit, and hence he was admitted to a high care unit where he was maintained on continuous oxygen until he was referred for neurosurgical evaluation in one of the private hospitals. The pupils were fixed, dilated, and unresponsive to light. Head circumference= 58cm (normal 53-55 cm), anterior fontanel 1cm x 1cm, and the posterior fontanel admitted the tip of a finger. He was pale and febrile (38^0 C). Laboratory results revealed mild normocytic normochromic anaemia with the haemagram of the followings: Hb 10.4g/dl, RBC 4.3x106/µL, HCT 32%, MCV 81fl, MCH 27 pg, MCHC 34g/dl, RDW 13%, platelets 340,000/µL, WBC 7200/µL with differential of: neutrophils 50%, lymphocytes 38%, monocytes 6%, basophils 0.6%, and eosinophils 2%, elevated erythrocyte sedimentation rate 95mm/hr, positive blood film for Plasmodium falciparum 4 parasites, per 100 HPF. Electrolytes, liver function tests, urea, and creatinine were normal. Chest X-ray was normal. GeneXpert was performed and was negative for TB.

A provisional diagnosis of hydrocephalus with coma secondary to cerebral malaria was made. Our differential diagnoses included a space-occupying lesion (e.g., tuberculoma, brain abscess, tumour). He was infused with a calculated dose of quinine, 20mg/kg as a loading dose, then 10mg/kg 8 hourly; an anti-meningitis dose of cefepime 50mg/kg 12 hourly, and vancomycin 20kg/kg 8 hourly; and dexamethasone 0.6 mg/kg in four divided doses. Due to the high ESR, he was given an anti-tuberculous regimen of isoniazid, rifampicin, ethambutol, and pyrazinamide at the dose of three tabs dissolved in clean water and administered via a nasogastric tube. However, there was no improvement.

A brain CT scan was requested on the tenth day since

admission, and this showed a left parietal cerebral hypodense, well-circumscribed lesion, demonstrating marginal enhancement measuring 6.5x5.4x4.1cm. There was compression and dilatation of the left lateral ventricle. The right cerebral hemisphere, cerebellum, and brainstem were normal, with no midline shift.

It was concluded that there was an obstructive hydrocephalus with a left parietal cerebral focal lesion, most likely an astrocytoma or abscess. However, based on the history, physical examination, and brain CT scan, we suspected a pilocytic astrocytoma. The patient was referred for neurosurgical assessment in one of the private hospitals in Juba. The parents were unable to afford the cost of the surgery, and hence, a definitive histological diagnosis was not possible. Unfortunately, we learnt that, three weeks later, our patient was operated upon in a private hospital and two days later died.

Discussion

Pilocytic astrocytoma (PA) is a slow-growing glioma classified by the World Health Organization (WHO) as a grade I tumour.[12] It is commonly found in children aged 5 to 14 years, with the highest incidence between 6 and 8 years, and slightly more males than females.[2,3,4] Our patient was a male aged six years.

A PA is slow-growing with insidious presenting features. The symptoms depend on the tumour's location.[1] Most PAs are diagnosed when they are large, compressing adjacent structures and increasing intracranial pressure.[1] Headache is the commonest symptom,[12] although our patient had not complained of a headache, bearing in mind the impaired consciousness.

He presented with fever and impaired consciousness. The fever appeared to be caused by malaria and subsided following quinine infusion, but the convulsions persisted. A cerebral abscess was considered, but there was no response to antibiotics, and the differential WBC was normal. Therefore, it was highly likely that the seizures and impaired consciousness were caused by the pressure effect of a PA on the surrounding tissues and the obstructive hydrocephalus. Neuroimaging plays a crucial role in the diagnosis and management of PA.[13] On CT scans PAs usually appear as round/oval lesions with well-defined iso- or slightly hypo-dense areas, markedly enhanced with contrast media.[13] On the other hand, magnetic resonance imaging (MRI) displays hypodense (darker than the surrounding tissues), isodense (the same brightness as the surrounding tissues), or hyperdense (whiter than the surrounding tissues), with clear or diffuse enhancement.[1,13] The masses may have cysts or "tumour nodules in a cyst," an appearance particularly seen in cerebellar and cerebral hemisphere tumours.[13] The CT scan of our patient showed the left parietal cerebral hemisphere with a hypodense area of a well-circumscribed lesion with marginal enhancement. The size of the PA in our case (6.2x5.4x4.1cm) was within the previously reported range (4–10cm).[14]

PAs occur most commonly in the cerebellum and regions around the third ventricle, followed by, the optic nerve and chiasm, hypothalamus, brainstem, thalamus, basal ganglia, and cerebral hemispheres.[1] Sixty-seven percent of childhood PAs arise in the cerebellum. In our case, it was in the left parietal cerebral lobe. Our patient had an obstructive hydrocephalus, which occurs in 90% of PA cases.[6] The histopathological characteristics show loose microcystic areas interspersed with compact, fibrillary regions. Rosenthal fibres and eosinophilic granular bodies are common.[15]

Surgical resection is the ideal approach for PAs. In cases that are inoperable because of a very high-risk location or the patient is unfit for surgery, alternate approaches like partial resection with adjuvant therapies, which include chemotherapy with carboplatin, vincristine, and temozolomide. Radiotherapy may also be considered.[16]

Conclusion

This case demonstrates the challenges in referral, diagnosis, and management of PA in low-resource settings such as South Sudan, and especially with fragile health systems.

A thorough clinical assessment and prompt referral to a tertiary children's hospital (Al Sabah Children's Hospital) improve outcomes. Greater financial support for the paediatric hospital is needed to facilitate the development of a comprehensive CT and MRI imaging unit. Furthermore, a paediatric surgical unit with a well-equipped theatre is needed since specialized human resources are available. There is also a need to establish a well-equipped paediatric ICU, complemented by capacity-building for staff at different levels, with appropriate specialists.

There is a great need to support family members in accessing expensive medical services while they wait for the government to create national health insurance.

Declarations: Written informed consent for publication was obtained from the patient's parent.

Competing interests: None.

Author's contributions: JS drafted the case report, literature review, and conclusion with recommendations,

while KS reviewed, expanded it, and edited. All reviewed the final manuscript and agreed on the final version.

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Comparison of metformin, dapagliflozin, and their combination in the management of Type 2 diabetes mellitus: A review

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ABSTRACT

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder with a high global prevalence, including in Indonesia. Metformin is the most commonly used first-line therapy. However, disease progression often necessitates combination therapy. Dapagliflozin, an SGLT2 inhibitor, has been shown to reduce blood glucose levels and body weight. This review aims to compare the effectiveness, safety, and cost-effectiveness of metformin, dapagliflozin, and their combination in patients with T2DM. A literature search was conducted through PubMed, NCBI, and Google Scholar using relevant keywords. Inclusion criteria included publications from 2015 to 2025 that compared metformin, dapagliflozin, and their combination. Five studies meeting the criteria were analyzed to assess therapeutic effectiveness, safety, and cost-effectiveness. Combination therapy with dapagliflozin and metformin resulted in significantly greater reductions in HbA1c and body weight, as well as improvements in metabolic parameters, compared with monotherapy. The combination demonstrated a favorable safety profile, with a mild increase in urinary tract and genital infections that were generally well tolerated. Pharmacoeconomic analyses indicated that early initiation of combination therapy was more cost-effective in the long term than a stepwise approach. Dapagliflozin–metformin combination therapy is more effective and cost-efficient than monotherapy for managing T2DM, with an acceptable safety profile. This regimen may be considered as an alternative for patients who do not achieve glycaemic targets with monotherapy.

Keywords: diabetes mellitus, type 2; metformin, dapagliflozin, Indonesia

Introduction

Diabetes mellitus (DM) is a chronic metabolic disorder that occurs when insulin function is impaired, resulting in suboptimal regulation of blood glucose levels and, consequently, hyperglycaemia.[1] The most common type of DM worldwide is type 2 diabetes mellitus (T2DM), accounting for more than 95% of all cases. According to the World Health Organization (2025), approximately 830 million people worldwide live with DM, most of them in low- and middle-income

countries. More than half of people with DM still lack adequate access to treatment. In Indonesia, the prevalence of DM increased from 6.9% in 2013 to 10.9% in 2018, based on the National Basic Health Research (Riskesdas) report.[2] This increase is influenced by several factors, including age, lifestyle, history of certain diseases, genetic predisposition to other health conditions, and the use of specific medications.[3,4]

Management of T2DM includes various pharmacological therapies, including metformin, sulfonylureas, thiazolidinediones, DPP-4 inhibitors, SGLT2 inhibitors, GLP-1 receptor agonists, and insulin.[5,6] Drug selection is tailored to the patient's condition and glycaemic control targets.[7] Metformin remains the recommended first-line therapy for glycaemic management in patients with T2DM and has been proven to significantly reduce glycated haemoglobin (HbA1c) levels.[8–10] However, as the disease progresses, metformin monotherapy is often insufficient to maintain optimal blood glucose control. Standard T2DM management typically begins with lifestyle modifications alongside metformin therapy.

Dapagliflozin, a member of the sodium-glucose cotransporter 2 (SGLT2) inhibitor class, is a newer oral antidiabetic agent that has demonstrated the ability to lower both HbA1c and body weight in patients with T2DM, whether as monotherapy or in combination with other antidiabetic drugs.[11,12] Dapagliflozin works by inhibiting glucose reabsorption in the proximal renal tubules, thereby increasing urinary glucose excretion and lowering blood glucose levels. It is recommended for the management of T2DM due to its sustained effects in reducing blood glucose and HbA1c.[13]

Metformin, a biguanide, exerts its effects through both AMP-activated protein kinase (AMPK)-dependent and AMPK-independent mechanisms, inhibiting key enzymes involved in gluconeogenesis and lipogenesis. This review aims to evaluate and compare the effectiveness of dapagliflozin and metformin, both as monotherapy and in combination therapy, in patients with T2DM.

Method

This review used an electronic literature search across PubMed, NCBI, and Google Scholar databases to identify studies comparing metformin, dapagliflozin, and their combination in the management of T2DM. The search was limited to articles published between January 2015 and March 2025 using the keywords *"metformin, dapagliflozin, combination therapy,* and *type 2 diabetes mellitus"*. Studies were included if they were published in peer-reviewed journals, assessed outcomes such as glycaemic control (HbA1c), metabolic parameters, safety, or cost-effectiveness, and were available in full text. Exclusion criteria included studies involving paediatric populations or type 1 diabetes mellitus, case reports, editorials, letters to the editor, articles with insufficient data, and duplicate publications. Five studies met all criteria and were included in the qualitative synthesis. The selection process followed PRISMA guidelines and is summarized in the flow diagram (Figure 1).

Results

Based on the inclusion and exclusion criteria outlined in the methods, 356 articles were identified, from which five articles were selected that compared the use of metformin, dapagliflozin, and their combination in patients with T2DM. These articles were analyzed to evaluate the effectiveness, safety, and cost-effectiveness of each therapeutic regimen. A summary of the findings from these five studies is presented in Table 1.

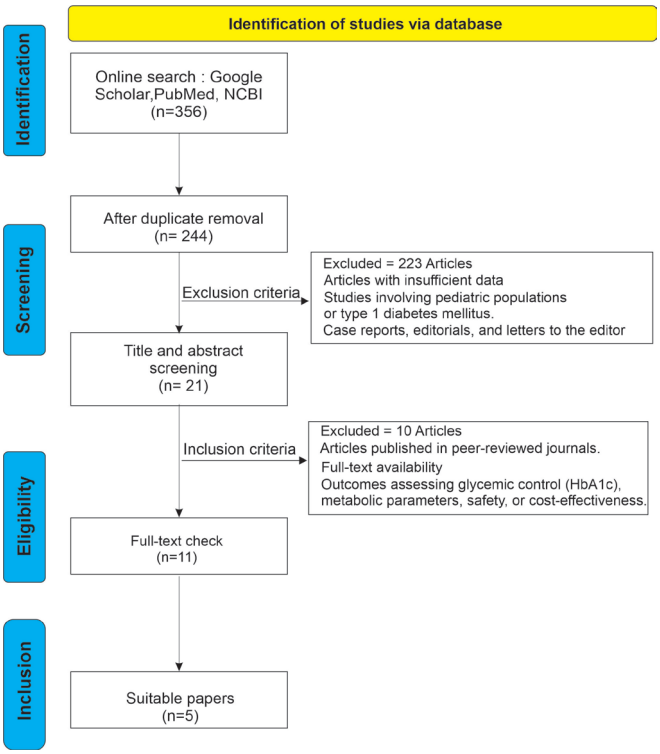

Figure 1. PRISMA Flow Diagram of Study Selection

Table 1. Comparison of metformin and dapagliflozin use in type 2 diabetes mellitus patients

Reference	Method	Result
Efficacy (including safety)		
[14]	This study included 248 patients admitted to Jiangxi Provincial People's Hospital from January 1, 2017, to December 31, 2019, with a diagnosis of metabolic syndrome. Participants were randomly assigned into three groups: dapagliflozin, metformin, and dapagliflozin plus metformin.	The combination of dapagliflozin and metformin produced greater improvements across all aspects of metabolic syndrome compared to either drug used alone.
[12]	This open prospective study was conducted over a period of six months at a tertiary teaching hospital in Jammu, involving 60 obese women with new-onset T2DM who met the inclusion and exclusion criteria.	The combination of dapagliflozin with metformin showed higher effectiveness than metformin monotherapy in achieving optimal glycaemic control.
[15]	A systematic review of randomized controlled trials was conducted, and the Cochrane risk of bias tool was used for quality assessment. The Patients, Interventions, Comparisons, and Outcomes (PICO) technique was used to select relevant articles to meet the objectives.	Combination therapy with metformin and SGLT2 inhibitors was more effective in lowering HbA1c and body weight than metformin monotherapy alone. Among the three SGLT2 inhibitors, dapagliflozin, canagliflozin, and empagliflozin, weight loss efficacy was not significantly different..
[16]	The MEDLINE and Embase databases were searched for controlled studies including dapagliflozin sodium, randomized controlled trials (RCTs), metformin, and efficacy. The search was limited to English language, human studies, randomized controlled trials, and clinical trials (phase 3 and phase 4).	The combined use of dapagliflozin and metformin has demonstrated both safety and efficacy in treating T2DM, with only minor adverse effects.
Cost-effectiveness		
[17]	Data between January 1, 2013 and December 31, 2016 were analyzed to determine the time required to add an SGLT2 inhibitor in patients starting metformin monotherapy.	Initiating treatment with a combination of dapagliflozin and metformin as first-line therapy may offer a more cost-effective strategy for managing T2DM patients in Australia compared to starting with metformin alone and subsequently adding dapagliflozin.

Discussion

Diabetes mellitus (DM) is a chronic metabolic disease characterized by elevated blood glucose levels due to insufficient insulin production (type 1 DM) or resistance to insulin's effects (T2DM).[18,19] Diagnosis of DM involves fasting plasma glucose (FPG), glycated haemoglobin (HbA1c), and oral glucose tolerance tests (OGTT).[20,21] Management of T2DM typically begins with lifestyle modification and metformin as first-line therapy due to its effectiveness in reducing HbA1c, low risk of hypoglycaemia, and relatively low cost.[22] However, if glycaemic targets are not achieved, combination therapy with other oral antidiabetic drugs (OADs) is often required to control hyperglycaemia and prevent long-term complications. One of the newer drug classes used as an add-on therapy is sodium–glucose cotransporter 2 (SGLT2) inhibitors, which work by inhibiting glucose

reabsorption in the kidney and increasing urinary glucose excretion. Dapagliflozin, an approved SGLT2 inhibitor, can be used as monotherapy or in combination with metformin. Recent clinical guidelines, including the American Diabetes Association (ADA) 2025 Standards of Care, European Association for the Study of Diabetes (EASD) consensus reports, and Indonesian Society of Endocrinology (PERKENI) guidelines, recommend metformin as initial pharmacotherapy, with SGLT2 inhibitors prioritized as add-on agents, particularly for patients with cardiovascular disease, heart failure, or chronic kidney disease due to their proven cardiometabolic benefits. This review aims to evaluate the effectiveness and safety of dapagliflozin–metformin combination therapy in patients with T2DM.[23,24]

Both dapagliflozin and metformin are widely used oral antidiabetic agents for T2DM. Evidence from multiple studies demonstrates the superior efficacy of their combination therapy compared with either drug alone. Cheng et al. (2021) reported significant improvements in metabolic syndrome components, including reductions in body weight, BMI, waist circumference, fasting blood glucose, insulin resistance (HOMA-IR), hs-CRP, and lipid profiles with the combination versus monotherapy. Similarly, Singh et al. (2024) found that obese women over 40 years with newly diagnosed T2DM experienced greater HbA1c reductions (>10%) compared to metformin alone (4.46%, $p < 0.001$), with effects sustained through week 12. A systematic review by Molugulu et al. (2017) further confirmed that combination therapy with metformin and SGLT2 inhibitors, including dapagliflozin, significantly lowered HbA1c and body weight across all included RCTs ($p < 0.05$).

Safety is an important consideration in diabetes therapy to prevent long-term adverse effects. According to Alkhanferi et al. (2022), dapagliflozin–metformin combination therapy demonstrated a favorable safety profile. The combination did not significantly increase hypoglycaemia or electrolyte disturbances compared to metformin alone. However, a higher incidence of urinary tract infections (UTIs) and genital infections was observed in patients receiving dapagliflozin, although these were generally mild and did not lead to treatment discontinuation. This suggests that the adverse effects of dapagliflozin are generally tolerable, especially when its clinical benefits outweigh the potential risks.

Cost-effectiveness analysis compares the relative costs and outcomes of health interventions, and Chin et al. (2019) reported that dapagliflozin–metformin as first-line therapy was more cost-effective than sequential addition of dapagliflozin to metformin monotherapy. Early combination therapy reduced hospitalization for heart failure by 5.5%, cardiovascular mortality by 57.6%, and all-cause mortality by 29.6%, adding 1.9 quality-adjusted life years (QALYs) per patient with an incremental cost-effectiveness ratio (ICER) of AUD 12,477 per QALY, within Australia's cost-effectiveness threshold. Overall, evidence consistently shows that the combination provides superior glycaemic control, greater weight reduction, and improved metabolic outcomes compared with monotherapy, with a favorable safety profile marked by only a slight increase in mild UTI risk, supporting its role as a promising therapeutic option for patients with T2DM inadequately controlled on monotherap

Most included studies originated in Asia or Australia, limiting their direct applicability to African populations, where healthcare infrastructure, diagnostic capacity, and medication access differ significantly. To improve feasibility in African settings, several practical strategies can be adopted. First, governments and health agencies could negotiate tiered pricing or pooled procurement agreements with pharmaceutical companies to lower costs and expand access to SGLT2 inhibitors. Second, once available, generic formulations should be prioritized to reduce treatment costs. Third, task-shifting diabetes care to trained primary care providers and community health workers can help address shortages of endocrinologists and specialists. Fourth, integrating diabetes management into existing noncommunicable disease programmes such as hypertension or HIV care platforms can leverage existing infrastructure and reduce costs. Finally, local implementation research should be conducted to assess real-world effectiveness, safety, and cost-effectiveness, ensuring that recommendations are adapted to each country's healthcare capacity and economic constraints.

It is also important to consider the accessibility of dapagliflozin. Although the drug has been included in the WHO Essential Medicines List, its availability and affordability remain limited in many low- and middle-income countries. This creates a significant barrier to its widespread use in the populations that may benefit the most. Furthermore, while urinary tract and genital infections associated with dapagliflozin are generally mild and manageable in high-resource settings, they may pose a greater health burden in resource-poor countries where access to timely diagnosis and treatment is limited. Evidence from a study involving 2,990 patients with T2DM in China showed that the incidence of urinary

tract infection was only 2.1–2.3%, and genital infection 1.5%, confirming that these adverse events are relatively uncommon and generally well tolerated.[25] However, these findings largely reflect data from higher-resource settings, and the lack of large-scale safety and cost-effectiveness studies in low-income regions limits their generalisability. Future research should incorporate local drug pricing, healthcare infrastructure, and resource availability to ensure therapeutic recommendations are evidence-based and context-specific.

Conclusion

Based on the review of five studies, the combination of dapagliflozin and metformin demonstrated superior effectiveness in reducing HbA1c levels, body weight, and improving metabolic parameters compared to metformin or dapagliflozin monotherapy. In terms of safety, the combination was generally well tolerated, although a slight increase in the incidence of non-severe urinary tract and genital infections was observed. These findings are further supported by evidence of cost efficiency, indicating that combination therapy is more cost-effective in the long term compared to a stepwise approach. Therefore, dapagliflozin–metformin combination therapy may be considered as an alternative for patients with T2DM who have not achieved therapeutic targets with monotherapy. Nevertheless, its use should be tailored to each patient's clinical condition, taking into account the therapy's risks, benefits, and accessibility.

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Conflicts of interest: None

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Data availability: All data supporting the findings of this review are derived from previously published studies, which are properly cited in the reference list.

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Fish floss in South Sudan

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The article from Indonesia on page 45 showed that consumption of catfish floss increased haemoglobin levels among teenage girls. A similar product is made in South Sudan.

Fish floss, locally known as *Gër* in the Dinka language, is a traditional preserved fish product widely consumed in the swampy grasslands (*Toich*) of Twic East County, Jonglei State, South Sudan. It is primarily produced from catfish (*Clarias* spp.) and mudfish (*Protopterus* spp.), although Nile perch (*Lates niloticus*) may also be used. The product plays an important role in local food security due to its long shelf life, high protein content, and cultural significance.

The preparation of *Gër* involves a series of traditional processing. Freshly harvested catfish are first cleaned and longitudinally sliced to expose the subcutaneous and visceral fat deposits. The fat layer is carefully removed and heated gently to extract fish oil by melting. The clarified oil is then filtered and stored for later use in frying and preservation.

After oil extraction, the fish carcasses are boiled in water until the muscle tissue is tender and fully cooked, facilitating separation from the skeletal structures. These fillets are subsequently fried in the previously extracted catfish oil at moderate temperatures until they attain a characteristic brown colouration and fibrous texture. This frying step further reduces the moisture content and induces lipid uptake, contributing to the product's distinctive flavour, aroma, and energy density.

Additional fish oil may be incorporated after frying to enhance palatability and improve preservation by creating a lipid barrier that limits oxygen exposure and microbial growth. The final product, Gër, is a dry, oil-rich, shelf-stable fish preparation that can be stored for extended periods without refrigeration. Its traditional processing method represents an effective indigenous food preservation strategy that combines thermal processing, dehydration, and lipid enrichment to ensure food availability during periods of scarcity.

South Sudan Postgraduate Training Programme

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Introduction

At the South Sudan Physicians virtual meeting on 6th September 2025, there was a consensus to establish a South Sudan postgraduate programme in General Internal Medicine. It was also agreed to adopt the Fellowship training programme of the East, Central and Southern African College of Physicians (ECSACOP) by setting up a recognised ECSACOP training centre at Juba Teaching Hospital once the hospital has been approved for training by ECSACOP. The South Sudan Physicians Association has been admitted as a member of ECSACOP, paving the way for training to begin in South Sudan.

The need to establish a local postgraduate training programme for South Sudanese doctors was identified during a visit by a delegation of St. Mary's Hospital (Isle of Wight, UK)-Juba Link Charity in 2008. I was part of that delegation, which identified the following drivers for establishing a South Sudan postgraduate medical training programme:

1. Insufficient specialist doctors to provide basic services in hospitals in the country and the Community
2. Lack of sufficient doctors with training to provide community Healthcare needs at the county level
3. Lack of trained senior doctors to offer structured on-the-job training to new generations of doctors, clinical officers, and other high-level healthcare professionals
4. The local university medical faculty is understaffed
5. Urgent need for the development of skilled health manpower for the new country, which gained independence from Sudan in 2011, to build capacity in the Healthcare sector.

The alternative to a local postgraduate programme currently includes sending eligible candidates for higher training to neighbouring countries for postgraduate studies. This is expensive, disruptive to the family lives of the postgraduate trainees, and the training may lack relevance to South Sudan. This would inevitably have a negative effect on the future development of a South Sudan postgraduate programme and risk a brain drain of trained professionals, as the trained doctors may be attracted to remain in their host countries, where conditions of service may be better than in South Sudan.

The South Sudan Health Statistics make grim reading as shown below:[1,2]

1. Maternal mortality 692/100,000 of births (compared with neighbouring Sudan 256/100,000 and the United Kingdom 7/100,000),
2. Mortality of children under five years 99/1,000 live births,
3. More than 87% of births take place at home (by traditional birth attendants or unskilled relatives),
4. 40% of all births are carried out by skilled healthcare professionals,
5. 13.6% of deliveries occur in a health facility due to poor or lack of access,
6. Life expectancy is 59 years compared with Uganda 65.9 years, Tanzania 66.8 years, and the UK 79 years.

Hence, an improved health workforce will address this grim health situation by acquiring better clinical, management, and leadership skills following training.

It is estimated that current expenditure on medical treatment in neighbouring countries, the Republic of South Africa, the United Kingdom, India, and various European countries is 25,000,000 US$ per annum. This money would be adequate to implement an imaginative postgraduate training programme, provide adequate accommodation for doctors, nurses, and other healthcare professionals, and establish the first wave of integrated Primary Healthcare centres in various counties.

The following basic resources developed by the Juba Link are already in place to support the proposed postgraduate training programme:

1. A ten-roomed ***Postgraduate Medical Centre,*** currently called the College of Physicians and Surgeons, complete with a library.

2. A ***Link House***, which is a six-bedroom self-contained building constructed on the hospital grounds opposite the main Teaching Hospital in Juba. The land on which it was built was secured with the permission of the Ministry of Health (MOH) and a Memorandum of Understanding between the Juba Link, currently represented by me, and the MOH. This building was intended to accommodate suitably qualified visiting trainers travelling from the United Kingdom, East and Central Africa, and other countries specifically to deliver training to South Sudanese doctors on the proposed postgraduate programme. Following the December 2013 crisis in South Sudan, the MOH used the Link house to accommodate some doctors, and it has not been available to serve its originally intended purpose. Its use will need to be reviewed by the working group on the postgraduate programme to ensure it is vacated by those currently occupying it, enabling renovations to take place.
3. ***A Basic Medical Training Programme (BMT) curriculum*** covering the first two years of training after qualifying in medicine to prepare the young doctors for competent work with minimum supervision in rural areas prior to commencing postgraduate training. This scheme was intended to produce doctors well prepared to work independently or with limited supervision in rural areas before undertaking postgraduate studies.
4. ***Logbooks*** for progressive assessment of trainees on the basic medical programme.
5. ***Training Curricula*** in the core medical specialties will be based on the ECSACOP programme and the United Kingdom programme in Internal Medicine. The Juba Link considered the provision of training in Primary Healthcare, and I thought that a Master's Degree programme in Primary Healthcare needed to be established and run alongside the core medical specialties to address the unmet healthcare needs of rural communities.[3] Training in other areas of medicine, such as Orthopaedics, Emergency Medicine, Radiology, and Anaesthesia, will be introduced with the support of relevant Colleges in the Region. A Master of Medicine in Paediatrics is currently in its early stages of development in Juba. Introducing too many specialties concurrently may compromise the efficient running of the programme due to a lack of training resources. Concentrating the training in Juba in the first instance will enable lessons to be learned before rolling the programme to other parts of the country.

Benefits of a local Postgraduate Training Programme

1. Sets specialist standards for Consultants and Trainers, pegged to internationally agreed standards.
2. Organises and runs examinations and refresher courses for practising clinicians.
3. Publishes evidence-based local guidelines to inform sound clinical practice.
4. Promotes scientific and clinical research.
5. Enables skills transfer to clinical practice based on tried systems elsewhere to drive the training of younger doctors.

Curriculum

Rather than reinvent the wheel, I propose that we adopt the following curriculum with adaptation to our circumstances in South Sudan:

General Internal Medicine may be encouraged to consider an equivalent curriculum of relevant Colleges in the Region.

On passing the fellowship examinations of ECSACOP, entry into the Royal College of Physicians of the United Kingdom Medical Training Initiative (MTI) should be encouraged to enable locally trained physicians in South Sudan develop *Clinical, Communication & Leadership* skills in another environment. Some may take examinations in specific areas such as infectious diseases, echocardiography, and elderly care medicine during the two-year MTI programme.

Implementing the postgraduate training programme requires the formation of a dedicated working group (WG) of competent and experienced clinicians across the hospital and primary healthcare. The WG will consist of representatives from the main medical specialties, but WG membership will be determined by consensus at the South Sudan Doctors forum when the programme is formally discussed and adopted. The University Faculty of Medicine should be represented, and a further two representing the University Council and Senate, respectively. This is vital as the trainees will have passed through the university. The WG may co-opt other members whose contributions may enhance the programme. Such co-opted members may include South Sudanese academics and clinicians in the diaspora. The Director General for Training in the Ministry of Health may be an ex officio member of the WG.

Trainers on the Fellowship Programme

Juba Hospital-based consultants in various specialties and lecturers in the Faculty of Medicine at the University of Juba will form the core trainers on the postgraduate programme. As these consultants will be undertaking training responsibilities alongside their contracted duties, appropriate remuneration for their training duties needs to be built into their salaries. Those hospital-based consultants who regularly undertake research and publish their work in recognised journals in the region and internationally should be considered for appointment as *Honorary Senior Lecturers* at the University of Juba. This will incentivise colleagues to undertake effective teaching and research.

External lecturers and professors visiting Juba to undertake teaching, assessment of trainees, and help with the development of the programme will be needed in the initial years of the programme. These trainers will work alongside Juba consultants and university lecturers in their relevant specialties. The Juba Link has developed a database of interested trainers from the UK whose visits were due to start in January 2014, but the crisis of 13th December 2013 put a stop to the trainer visiting programme. This scheme needs to be reactivated with the WG's help, and funding identified to support it.

To ensure that t*eaching, assessment of trainees, and constructive feedback to trainees* during the programme are conducted consistently across all specialties, I propose that all trainers based in Juba and those visiting South Sudan from abroad attend the well-developed Training the Trainers course run by the Royal College of Physicians, London. This course has been conducted in Sudan, Uganda, various Middle Eastern countries, Pakistan, and India, among others, and has received excellent reviews from participants across these countries.[4] The course lasts a week and will be conducted in Juba before the start of the programme. It costs about five to seven and a half thousand pounds Sterling.

Summary

A postgraduate programme for South Sudan is essential and needs to be introduced in 2025/26. The programme will enhance capacity building in healthcare and is likely to improve service delivery at the community level. It requires careful and consistent planning. Some arrangements to support the programme are already in place. Members of the WG have an enormous task to deliver the programme through consistent and devoted work.

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The Royal College of Physicians (RCP), London, Medical Training Initiative: Overview and benefits for international doctors seeking short-term UK experience

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Background and overview

In the UK, each Medical Royal College offers the Medical Training Initiative (MTI). The Royal College of Physicians of London (RCP) MTI is one of the longest-running schemes and is overseen by an experienced MTI team within the RCP Global Department. At any given time, approximately 150-180 doctors from across the globe are working in RCP MTI posts.

The RCP MTI provides short-term hands-on clinical learning opportunities (6-24 months) within NHS hospitals across the UK. The MTI is designed to support postgraduate specialty training and experience, and all physician specialties are considered. Doctors must have a primary medical qualification recognised by the GMC and at least 3 years of postgraduate experience, including at least 1 year in the specialty in which they intend to train in the UK. Full eligibility criteria can be found here.

Doctors typically secure suitable MTI posts by applying online to platforms such as NHS Jobs. Others may secure posts through contacts and partnerships held between individuals or organisations situated in the UK. Once a post is secured, the RCP MTI application processes commence, including visa sponsorship and acquisition of GMC registration.

Benefits and reasons to choose the RCP MTI

There are numerous benefits reported by MTI doctors who come to the UK via this route including:

- An opportunity to work within the NHS; one of the world's leading healthcare systems.
- A chance to explore an area of clinical interest, such as the development of a procedural skill or learning from leading experts delivering subspecialty services.
- Development of non-clinical skills such as quality improvement, research, leadership, and management.
- A chance to network and build relationships with colleagues working internationally in your field of interest.
- Consistent support from the RCP during the application processes and during placements to support integration and professional development, for example, through our bespoke induction programme.
- Free RCP membership facilitates access to the RCP's vast international network as well as opportunities to attend courses, conferences, and events, and access to various eLearning materials.
- Free access to an online specialty portfolio platform to document learning, experience, and development to aid the structure and consolidation of the UK experience and how this will be translated upon return home.

Quote from a former MTI doctor:

> *"I witnessed the practice of evidence-based medicine tailored to individual patients. I was able to see a variety of patients in Endocrinology and had opportunity to see rare disorders which I have not seen much during my local training. The knowledge, attitude and practice I gained from UK will help to serve patients better in my country when I am back. I am ever thankful to RCP MTI scheme for organizing this training, helping throughout training period and looking after during the stay in the UK."*

In addition to the above-listed benefits, RCP Global has a close working relationship with the East, Central, and Southern African College of Physicians (ECSACOP).

This connection and understanding of the postgraduate programme of training, provides an additional link and network, which could further enhance individual MTI experience as well as associated partnership activities across the region.

What to expect during a post

Doctors are encouraged to consider their personal learning objectives when applying for the MTI, and to work closely with their employing NHS hospital and the RCP MTI team, who help to facilitate suitable posts to enable the acquisition of these objectives.

During placements, the MTI team is available to respond to any personal or professional queries to aid a positive UK experience. Doctors are assigned a UK-based supervisor to support professional development throughout the post, and the provision of a free online portfolio helps doctors to structure and document their learning. We additionally recommend that doctors be offered a supernumerary period to help with orientation and integration into their roles when they start their MTI posts. The weekly schedule of an MTI post varies hugely depending on the setting and type of post secured; this can usually be understood more via the job description when applying for a post and during the interview process, and clarified further upon commencement of the post in conjunction with the allocated MTI supervisor. If there are any home-country-specific curriculum or reporting requirements, we recommend that these be made clear to the employing NHS hospital during the application and onboarding process. Where feasible, it can also be helpful to have a home country supervisor or mentor to support the learning experience.

Throughout the process, the RCP provides support to NHS supervisors of MTI doctors. The RCP reinforces the importance of focusing on the personal objectives a doctor hopes to achieve during their post, and how these will be translated back into practice upon return home. At the end of the MTI post, an RCP-endorsed completion certificate is issued.

Want to learn more?

A wealth of information about the MTI can be found on our website.

For doctors keen to learn more about the MTI and tips on how to apply, we would like to invite you to our regular MTI Mondays webinars.

For any additional queries, please contact the team via email: MTI@rcp.ac.uk

Nestlé Denies 'Double Standards' Amid Sugar Content Controversy in African Baby Food

Nestlé has denied claims that its baby food products sold in African countries contain higher levels of added sugar, despite offering sugar-free versions in Europe. Over 90% of Cerelac products sold in 20 African countries are reported to contain added sugar, "often exceeding levels found in products marketed in Europe".

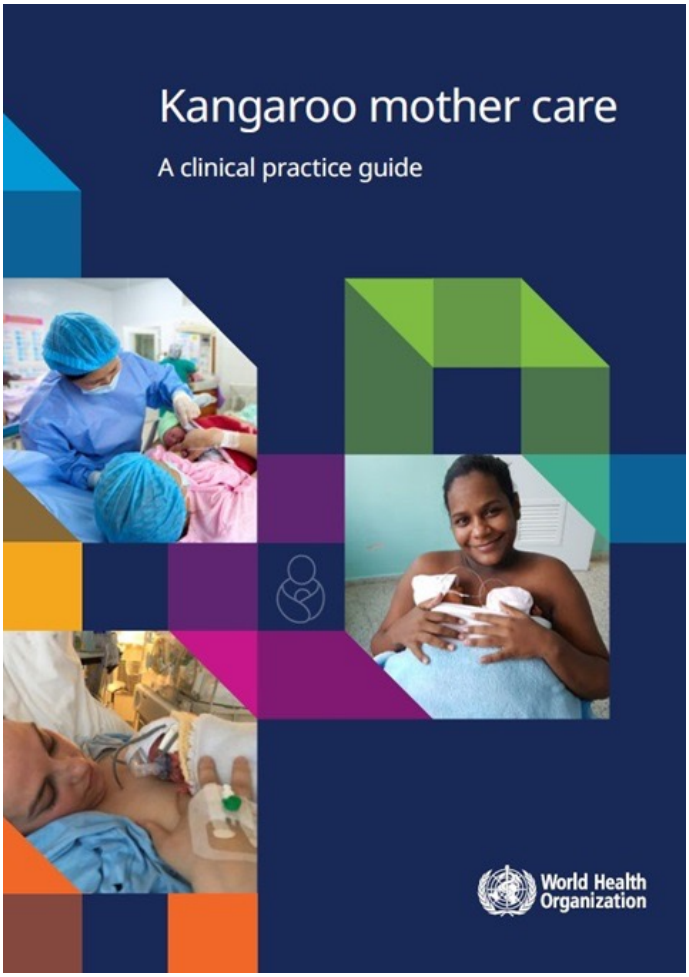
A spokesperson for the company said their formulations adhere strictly to international standards. The controversy arises amid growing concerns over childhood obesity in Africa, where early exposure to added sugars in infant food increases the risk of diseases.

https://allafrica.com/view/group/main/main/id/00094875.html?utm_campaign=daily-headlines&utm_medium=email&utm_source=newsletter&utm_content=group-view-link

WHO: Kangaroo mother care: a clinical practice guide

14 November 2025

| Technical document



Overview

This guide is designed to help health workers support mothers and families in practising Kangaroo Mother Care (KMC) in health facilities at all levels of care and at home. It also provides brief guidance for health facility administrators and programme managers on what they need to do to support KMC practice in health facilities. Kangaroo Mother Care is the term used for care of preterm and low-birth-weight newborns in prolonged skin-to-skin contact initiated as soon as possible after birth, with exclusive breast milk feeding.

https://www.who.int/publications/m/item/kangaroo-mother-care--a-clinical-practice-guide?utm_source=AlignMNH&utm_campaign=1c4b0ff14d-EMAIL_ALIGNMNH_NEWSLETTER_Nov_2025&utm_medium=email&utm_term=0_69a16bace3-1c4b0ff14d-1312240574

Four years of scientific conferences in South Sudan: Reflections from the former Secretary-General of the Association of Gynecologists and Obstetricians of South Sudan (AGOSS)

Dr Jok Thikuiy Gang, Former Secretary-General, AGOSS

Figure 1. Members of the Association of Gynecologists and Obstetricians of South Sudan (AGOSS) in Juba following the successful completion of a Training of Trainers programme aimed at strengthening postgraduate medical education in Obstetrics and Gynecology. This initiative underscores AGOSS's commitment to advancing specialist training and improving maternal health services across South Sudan. (Credit: AGOSS photo gallery)

Over the past four years, the Association of Gynecologists and Obstetricians of South Sudan (AGOSS) has made significant progress in strengthening medical education, professional collaboration, and clinical practice through its annual scientific conferences. These conferences have become a cornerstone of our efforts to improve maternal and reproductive health services in a country where the health system continues to face enormous challenges.

When AGOSS first initiated these scientific meetings, our primary objective was clear: to create a platform where practitioners, trainees, policymakers, and partners could come together to share knowledge, discuss evidence, and collectively shape solutions to improve women's health. Today, looking back at four consecutive conferences, it is evident that this vision has taken root and is yielding meaningful impact.

First, the conferences have enhanced continuous professional development for clinicians across South Sudan. Through expert presentations, case discussions, and hands-on workshops, hundreds of doctors, midwives, and nurses have gained new skills in emergency obstetric care, safe surgery, foetal monitoring, and reproductive health. These capacity-building efforts are contributing directly to improved quality of care in both public and private facilities.

Second, the conferences have strengthened the culture of research and evidence-based practice. Despite limited resources, we have witnessed increased interest among young doctors, residents, public health specialists, and midwives in presenting research abstracts, clinical audits, and case reports relevant to the South Sudan context. This has encouraged more institutions to begin documenting

Figure 2. A panel of experts deliberating on key challenges and advancements in maternal health services during the 3rd Annual Scientific Conference of the Association of Gynecologists and Obstetricians of South Sudan (AGOSS). The session highlighted evidence-based strategies, capacity building, and collaborative efforts aimed at improving women's health outcomes across South Sudan. (Credit: AGOSS photo gallery)

their experiences and generating local data to inform policy and clinical guidelines.

Third, AGOSS conferences have expanded professional networks and partnerships, both nationally and regionally. Through collaboration with the national Ministry of Health (MOH), East, Central and Southern Africa College of Obstetrics and Gynecology (ECSACOG), South Sudan General Medical Council (SSGMC), national universities, and international partners (including UNFPA, WHO, AMREF), we have created pathways for specialist training, mentorship, and joint projects - ECSACOG Membership Training Programme in South Sudan is born out of discussions during the 1st Scientific Conference. These networks are essential for building a resilient and competent health workforce.

Finally, the conferences have provided a platform for advocacy. By bringing together clinicians and policymakers, AGOSS has successfully highlighted major gaps in maternal health services, workforce shortages, and the need for investment in training and infrastructure. Some of these discussions have already influenced national strategies and institutional priorities. The Nurses and Midwives Bill was recently approved by the Council of Ministers, led by the president, following a recommendation from the 4th Scientific Conference. See Figures 1 and 2.

As a former Secretary-General of AGOSS who served for two consecutive terms (total of 4 years), I am proud of what we have achieved in a short period. Yet, much more remains to be done. South Sudan continues to face some of the highest maternal mortality rates globally. Strengthening scientific engagement and promoting continuous learning will remain critical as we work toward safer pregnancies, safer deliveries, and healthier communities.

AGOSS remains committed to fostering a vibrant scientific community, building strong professional networks, and advancing maternal health through knowledge, collaboration, and evidence. The progress of the last four years gives us confidence that together, we can transform not only the future of sexual and reproductive health care, but the general health care system in South Sudan.

Resolutions of the 4th Annual Scientific Conference of the Association of Gynecologists and Obstetricians of South Sudan (AGOSS)

16 November 2025
Pyramid Hotel, Juba, South Sudan
Reported by: Dr Zechariah J. Malel, President, AGOSS
Email: Zmdechol1892@gmail.com

1. Resolution on Safe Motherhood and Reduction of Maternal Mortality

South Sudan's current Maternal Mortality Rate stands at 692/100,000 live births. Low health funding, poor health infrastructure, poor referral system, bleeding after birth (60%), unsafe abortion (38%) and leadership issues ,among others, were outlined to be the causes.

AGOSS recommends:

- Strengthening surveillance and reporting of maternal deaths through the national Maternal and Perinatal Death Surveillance and Response (MPDSR) system.
- Training healthcare workers on early recognition and timely referral of obstetric emergencies.
- Strengthen the Boma Health Initiative to support timely referral from the community to health facilities, and community maternal health awareness campaigns.
- Promoting respectful maternity care (RMC) practices in all health facilities.
- Calling on the national government to prioritize funding for health in South Sudan, by increasing the health budget to 15% per the Abuja Health declaration.
- Improving abortion care services, including the reform of laws
- Calling on the Council of Ministers and the Transitional National Legislative Assembly to enact the following bills:
    - o Midwives and Nurses Council Bill
    - o Allied Health Professional Bill

2. Resolution on the Burden of Infertility in South Sudan

Male infertility cases are on the rise in South Sudan. Data from sperm analysis in Juba indicates that 84% of semen samples from approximately 2,287 cases were found to be abnormal. This highlights the growing concern of male infertility as a public health issue in South Sudan.

The conference recommends:

- The establishment of fertility services in the main public health facilities across South Sudan, including Juba Teaching Hospital (JTH), Wau Teaching Hospital (WTH), Kiir Mayardit (KWH), and Malakal Teaching Hospital (MTH).

3. Resolution on Menopause Awareness

The conference observed that menopause is among the neglected health concerns in South Sudan.

The conference recommends:

- To raise awareness of menopausal-related problems among communities.
- Health care providers, especially junior medical doctors, are advised to consider menopause as one of the differential diagnoses for cases that present with menopausal-like symptoms.

4. Resolution on Reproductive Health, Family Planning and Adolescent Health

The conference acknowledges that Family Planning is a human and a woman's basic right. Despite that, men still have a controlling and determinant role in their wives' use of family planning in South Sudan.

AGOSS resolves to:

- Recommend for unconditionally empowering women to voluntary access to family planning services.
- Enhance public awareness on the importance of voluntary family planning services.
- Advocate for adolescent-friendly sexual and reproductive health services across the country.
- Work with partners to reduce teenage pregnancy and its complications.

5. Resolution on the Fistula Burden

Obstetric fistula cases are on the rise in South Sudan, caused by high home deliveries (80%), lack of skilled birth attendance, and high rates of teenage pregnancy.

The conference:

- Calls for action to increase awareness on the importance of facility deliveries, training fistula surgeons, and treatment and rehabilitation services.

6. Resolution on Partnerships and Stakeholder Collaboration

AGOSS commits to:

- Strengthen partnerships with the Ministry of Health, UN agencies, NGOs, universities, and other professional bodies.
- Engage the private sector to support scientific innovation, capacity building, and reproductive health interventions.
- Formalize Memoranda of Understanding (MoU) with key partners to sustain long-term collaborations.

7. Resolution on Gender, Youth Empowerment, and Women's Health Leadership

The conference noticed alarming data affecting gender and youth, including child marriage (52%), and adolescent births (158 per 1,000 adolescents). South Sudan is the second country with high gender-based violence (GBV) cases in the region. The GBV Bill is still pending and has not been enacted.

The conference resolves to:

- Call upon the Ministry of Justice and Constitutional Affairs, Council of Ministers, and the Revitalized Transitional National Legislative Assembly to enact the GBV bill
- Empower women to have the right to access and decide on their health, including the right to consent for surgical operations such as life-saving caesarean section (C/S) and access to contraceptives.
- Create a platform for youth engagement in scientific research and community mobilization on Sexual and Reproductive Health and Rights (SRHR) issues.
- Work with the Office of the Vice President in charge of the Gender and Youth Cluster to advance the national gender agenda.

8. Resolution on Capacity Building and Postgraduate Medical Education

AGOSS commits to:

- Continue supporting the establishment and strengthening of obstetrics and gynecology postgraduate programmes in the country in collaboration with the College of Physicians and Surgeons of South Sudan (CPS), the University of Juba, the East Central and Southern Africa College of Obstetrics and Gynecology (ECSACOG), and other institutions that are willing to provide training.

9. Resolution on Research, Data Quality, and Scientific Advancement

The conference resolves to:

- Increase the days for the annual scientific conference from two to three days.
- Promote high-quality clinical and public health research among its members.
- Establish an annual AGOSS Research Grant to support young scientists and postgraduate trainees.
- Publish conference abstracts and proceedings to enhance local scientific visibility.

Learning About Global Health?

This page from the Wessex Newsletter provides guidance for those wanting to learn more about global health. Below are extracts – Note SSMJ is mentioned.

Academic Journals
The Lancet

- The Lancet Global Health
- The Lancet Planetary Health
- The Lancet Regional Health
- The Lancet Global Health Podcasts

Follow this link to see a video describing what the Lancet produces in relation to global health.

The British Medical Journal (BMJ)
- The BMJ Global Health

Royal Society of Tropical Medicine and Hygiene (RSTMH)
- Transactions of the RSTMH

World Health Organisation (WHO)
- Bulletin of the WHO

Global Health Journal Search
- Search engine of many global health journals

Other Journals and Newsletters
Africa Health Journal
- African Academy of Sciences Newsletter
- African Forum for Research and Education in Health
- Centre for Disease Control Around the World Newsletter
- Journal of Global Health Science
- National Institute of Environmental Health Sciences Global Environmental Health Newsletter
- Planetary Health Weekly
- Pulse Partnerships Newsletter from the Tropical Health Education Trust
- Royal Society of Tropical Medicine and Hygiene Newsletter
- South Sudan Medical Journal

The Online Introduction to Global Health has been produced by the Wessex Global Health Network in collaboration with the University of Winchester. No prior knowledge is required and it lasts between 6 - 10 hours.

eLearning
Many courses in global health are have been modified to be able to study them on line.

Future Learn : Future Learn has been geared to provide courses on-line for some time. It provides a wide range including courses on global health.

Global Health Training Centre
The Global Health Training Centre provides online courses in global health research, webinars and professional development. It is part of the Global Health Network, the aim of which is to support better research.

https://www.wessexglobalhealthnetwork.org/resources/learning-about-global-health