

Health system factors associated with clinic appointment-keeping among children under five years of age at the outpatient care department of the Entebbe Regional Referral Hospital nutrition unit. A cross-sectional study.

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ABSTRACT

Background:

The study aimed to determine the health system factors associated with clinic appointment-keeping among children under five years of age at the outpatient care department of the ERRH Nutrition Unit.

Methodology:

A quantitative descriptive cross-sectional study was conducted among caregivers of children under five years receiving outpatient severe acute malnutrition care at the ERRH Nutrition Unit. From a study population of 240, a sample of 144 participants was selected purposively. Primary data were collected using self-administered, closed-ended questionnaires with a five-point Likert scale. Data were coded and analyzed using SPSS through descriptive, correlation, and regression analyses at a 5% significance level. Validity was ensured through supervisor review, while reliability was assessed using test-retest. Ethical approval and informed consent were obtained.

Results:

A total of 103 of 140 questionnaires were returned, giving a 73.5% response rate. Females constituted 72.8% (75) of respondents, while males accounted for 27.2% (28). Most respondents, 74.8% (77), reported having missed a clinic appointment, compared with 25.2% (26) who had not. Pearson correlation analysis demonstrated a weak, positive, significant relationship between health system factors and clinic appointment-keeping ($r=0.271$, $p<0.001$, $n=103$). Bivariate regression analysis showed that health system factors explained 7.4% of the variation in clinic appointment-keeping ($R^2=0.074$; adjusted $R^2=0.069$; $SE=0.60450$). The regression model was statistically significant ($F=16.070$, $p<0.001$). Health system factors significantly predicted appointment-keeping ($B=0.335$, $SE=0.084$, $\beta=0.271$, $t=4.009$, $p<0.001$), indicating a positive association. The constant was also statistically significant ($B=2.296$, $SE=0.332$, $t=6.920$, $p<0.001$).

Conclusion:

Health system factors significantly influenced appointment-keeping, particularly waiting time, appointment scheduling, patient-health worker communication, and transport accessibility.

Recommendation:

Appointment scheduling systems should be optimized with clear reminders, such as SMS notifications.

Keywords: Clinic appointment-keeping, health system factors, severe acute malnutrition, outpatient nutrition care, children under five.

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BACKGROUND OF THE STUDY.

Health system factors play an important role in determining whether patients and caregivers keep scheduled clinic appointments. These factors include waiting time, availability of medicines, accessibility of health facilities,

adequacy of health workers, patient-health worker communication, appointment reminders, and the clarity of follow-up instructions. When health services are accessible, well organized, and responsive to patients' needs, they may encourage regular attendance, whereas weaknesses in

service delivery can contribute to missed appointments and poor continuity of care.

Evidence from northern Uganda among patients receiving HIV and AIDS care showed that pre- and post-counselling and waiting time were important predictors of attendance at the second clinic visit among newly diagnosed patients (Nakate, 2023). Similarly, long waiting times, particularly when health facilities experience a high patient workload, may discourage patients from attending scheduled clinic visits (Oliveira, 2019). In Sheema, Uganda, accessibility of health facilities and motivating factors such as availability of medicines and absence of transport costs were identified as significant facilitators of regular clinic attendance (Thomas, 2017). These findings indicate that the organization and accessibility of health services can either facilitate or hinder appointment-keeping.

Other health system challenges include inadequate staffing, delays at health facilities, and insufficient information about when and why patients should return for follow-up. These challenges may negatively affect patients' experiences and their willingness to return for subsequent appointments. Among patients with chronic conditions, absence of a medicine administration schedule, increasing numbers of prescribed medicines, and the absence of adverse events related to a medical condition were associated with missed appointments (Kalyango et al., 2014). Such challenges may partly reflect inadequate communication between health workers and patients and may consequently affect adherence to scheduled clinic visits.

Appointment scheduling and reminder systems are also important health system factors. A systematic review among diabetic patients found that long intervals between appointments and failure to provide appointment reminders were significantly associated with missed appointments (Sun, 2021). Regular reminders may help patients remember their appointments and maintain continuity of care, particularly among patients receiving long-term treatment. In nutrition services, knowledge of available services and the acceptability of therapeutic feeds have also been identified as factors influencing attendance. A study in

Ethiopia reported that knowledge of services, malnutrition, poor appetite for therapeutic feeds, and the palatability of ready-to-use therapeutic food were important considerations affecting attendance for severe acute malnutrition treatment (Puett, 2015).

The study aimed to determine the health system factors associated with clinic appointment-keeping among children under five years of age at the outpatient care department of the ERRH Nutrition Unit.

METHODOLOGY.

Research design.

This was a quantitative study that utilized the descriptive cross-sectional design. This research design allowed collection of data at a single point in time; it was more practical and efficient in investigating the factors that were associated with appointment-keeping. The research design allowed examining multiple potential factors simultaneously rather than independently examining each variable (Chirico, 2023). A quantitative approach was used because it involved a larger sample and didn't require a relatively longer time for data collection (Maier, 2023).

Target population.

The target population comprised 144 male and female caregivers, aged 15-60 years, of children under five years of age, who had received outpatient care for severe acute malnutrition (SAM) at the ERRH Nutrition Unit for more than a month and had given informed consent to participate in the study. This population was the most suitable for the study since they had attended outpatient care for a significant time period and therefore would give good information regarding how health system factors, socio-cultural and socio-demographic factors influence their appointment-attendance.

Sample size determination.

The sample size was determined using the Morgan and Krejcie table 1970 (Suharin, 2022).

N	S
210	132
.220	136
230	140
240	144
250	148

Where N stands for the study population

S stands for the sample size

The study population (N) for this study is 240 patients.

The study population was sourced from ERRH Nutrition Unit monthly reports, 2025.

Therefore, the corresponding sample size is 144 participants.

Sampling procedures.

Purposive sampling technique was used to select participants. This is a non-probability sampling method, where participants were selected based on specific characteristics, that is to say, caregivers of children under the age of five who received nutrition outpatient care. It allowed for the selection of participants who were pertinent to the study.

Data collection methods.

The study collected primary data using a questionnaire survey.

Data collection instrument.

Primary data were collected from selected respondents using a questionnaire survey. The questionnaire was self-administered because the respondents were considered capable of reading and completing the questions independently. This method was selected because it allows a large amount of data to be collected within a relatively short period (Rahman, 2016).

A questionnaire is a research instrument consisting of a series of questions designed to obtain relevant information from respondents (Petrat, 2022). Questionnaires were used in this study because they facilitate the collection of substantial amounts of information within a short period and allow for straightforward data analysis. The questionnaire consisted mainly of closed-ended questions, enabling respondents to provide responses efficiently and facilitating the coding and subsequent analysis of the collected data (David, 2025).

The questionnaire employed a five-point Likert scale, with responses ranging from 5 = Strongly Agree, 4 = Agree, 3 = Not Sure, 2 = Disagree, and 1 = Strongly Disagree. The questionnaire was administered to the selected respondents to obtain the information required for the study.

Administration of the instrument.

An introductory letter was obtained from Nkumba University to authorize data collection. The letter was presented during the data collection process. Permission was also sought from the relevant authorities at the ERRH Nutrition Unit to conduct the study within the facility. After obtaining the necessary authorization, questionnaires were distributed to the selected respondents. The completed questionnaires were collected after approximately thirty minutes.

Data analysis procedure.

Data from questionnaires were coded, entered, and subjected to statistical analysis using the Statistical Package for Social Sciences (SPSS). Descriptive statistics were run

to describe the demographic characteristics of the respondents. Both correlation and regression analyses were carried out to investigate the association of health system, socio-cultural, and socio-demographic factors on children's appointment-keeping for those children who were below five years old. Regression models were also employed in determining the magnitude to which each factor independently contributed to differences in appointment-keeping. Hypotheses were tested via comparison of the calculated values of p with the significance level of 0.05.

Quality control methods

Reliability and Validity were obtained by assessing the instrument items during construction. Validity referred to the degree to which a study accurately measures what it intends to measure, ensuring that the conclusions drawn are sound and applicable (Anderson, 2024). The data collection tool was discussed with the research supervisor to ensure relevance to the study, and necessary adjustments were made to get the final questionnaire for data collection.

Reliability referred to whether the research methods could produce consistent results multiple times (Team, 2025). Reliability of the data collection instrument was measured through a test-retest reliability method. This test involved giving a group of people the same test more than once. If the results of the test were similar each time the questionnaire was given to the sample group, then that indicated that the data collection tool was reliable (Team, 2025).

Ethical considerations.

The study was conducted following the acceptable ethics of scientific research. The study and all documents involved were approved by the Mildmay Uganda Research Ethics Committee. Written informed consent was obtained from all participants before data collection.

RESULTS.

Response rate of the study.

A total of 140 questionnaires were distributed to respondents, and 103 questionnaires were successfully returned, generating a response rate of 73.5%. In addition, the 73.5% response rate of the present study satisfies the recommended response rate of studies by Amin (2005), who posits that for generalization of findings, the response rate of a study ought to be 70% and above.

Socio-demographic characteristics.

The socio-demographic characteristics of the respondents included gender, with categories of male and female; highest level of education, categorized as none, primary, secondary, diploma, bachelor's degree, and master's degree; employment status, classified as employed or unemployed;

religion, including Catholic, Muslim, Protestant, and other religions; and history of missed clinic appointments, categorized as yes or no.

Table 1: Socio-demographic characteristics of respondents.

Characteristic	Category	Frequency	Percent (%)	Cumulative Percent (%)
Gender	Male	28	27.2	27.2
	Female	75	72.8	100.0
Highest Level of Education	None	11	10.7	10.7
	Primary	27	26.2	36.9
	Secondary	20	19.4	56.3
	Diploma	20	19.4	75.7
	Bachelor's	20	19.4	95.1
	Master's	5	4.9	100.0
Employment Status	Employed	73	70.9	70.9
	Unemployed	30	29.1	100.0
Religion	Catholic	28	27.2	27.2
	Muslim	33	32.0	59.2
	Protestant	28	27.2	86.4
	Others	14	13.6	100.0
Missed Clinic Appointment	Yes	77	74.8	74.8
	No	26	25.2	100.0

Source: Primary data, 2025

Gender.

The majority of respondents were female (72.8%), while males accounted for 27.2%. This indicates that women, particularly mothers or female caregivers, are the primary individuals responsible for taking children to the outpatient care department. The predominance of female caregivers suggests that they have the greatest influence on ensuring children adhere to clinic appointments. Therefore, health education and communication strategies should be tailored to effectively reach mothers, while also engaging male caregivers to enhance shared responsibility and potentially improve overall appointment adherence.

Highest Level of Education.

Respondents exhibited varying levels of education, with 10.7% having no formal education, 26.2% primary education, 19.4% secondary education, 19.4% diploma, 19.4% bachelor's degree, and 4.9% master's degree. This distribution shows that most caregivers (89.3%) had some level of formal education, which likely facilitates understanding of health information and adherence to clinic instructions. Higher educational attainment is associated with better comprehension of the importance of regular appointments, whereas caregivers with limited education may require additional support through simplified communication, visual aids, or verbal reminders to reduce missed appointments and ensure consistent child healthcare.

Employment Status.

A majority of caregivers (70.9%) were employed, while 29.1% were unemployed. Employment provides financial resources that may help caregivers afford transportation and other healthcare-related costs, but it may also limit the time available to attend appointments due to work commitments. Conversely, unemployed caregivers may face financial and logistical barriers that hinder appointment adherence. Addressing these challenges through flexible clinic hours, weekend services, and transport support can help both employed and unemployed caregivers maintain regular attendance, thereby improving health outcomes for children under five.

Religion.

The respondents were religiously diverse, with 32% identifying as Muslim, 27.2% as Catholic, 27.2% as Protestant, and 13.6% adhering to other religions. Religious beliefs often influence health-seeking behaviors, perceptions of illness, and decisions regarding medical care. Some caregivers may prioritize religious practices over scheduled appointments or seek alternative remedies. To address this, health education programs should incorporate culturally and religiously sensitive strategies, including engaging religious leaders and communities to promote timely clinic attendance and reinforce the importance of routine child healthcare.

Missed clinic appointments.

A significant proportion of respondents (74.8%) reported having missed a clinic appointment in the past, highlighting a prevalent challenge in appointment-keeping. This suggests that multiple factors, including socio-demographic characteristics, socio-cultural influences, and health system barriers, contribute to missed appointments. Addressing these challenges requires targeted interventions such as caregiver education, appointment reminders, flexible scheduling, and community-based support systems to ensure children consistently receive timely and essential healthcare services.

Health system factors and clinic appointment-keeping among children under five years of age at the outpatient care department of the ERRH nutrition unit.

This section presents the correlation and bivariate linear regression results of health system factors and clinic

appointment-keeping among children under five years of age at the outpatient care department of the ERRH Nutrition Unit.

Pearson correlation of health system factors and clinic appointment-keeping among children under five years of age at the outpatient care department of the ERRH Nutrition Unit.

Pearson correlation analysis was conducted at a 95% level of confidence in a bid to determine the relationship between health system factors and clinic appointment-keeping among children under five years of age at the outpatient care department of the ERRH Nutrition Unit.

Table 2: Pearson coefficient matrix of health system factors and clinic appointment-keeping.

		Clinic appointment keeping	Health system factors
Clinic appointment keeping	Pearson Correlation	1	.271**
	Sig. (2-tailed)		.000
	N	103	103
Health system factors	Pearson Correlation	.271**	1
	Sig. (2-tailed)	.000	
	N	103	103

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Primary data, 2025

From Table 2, the Pearson correlation coefficient of 0.271 implies that there is a very weak positive relationship between health system factors and clinic appointment-keeping. Furthermore, it also denotes that an improvement in health system factors leads to an improvement in clinic appointment-keeping, and also, a decline in health system factors leads to a decline in clinic appointment-keeping. To add on, the p-value of the correlation coefficient of 0.271 is 0.000, which is smaller than 0.05 at the 5% level of significance, implying that the relationship between health system factors and clinic appointment-keeping is significant at the 5% level of significance. Therefore, there is a very weak positive significant relationship between health system factors and clinic appointment-keeping among

caregivers of children under five years of age at the outpatient care department of the ERRH Nutrition Unit.

Regression analysis of health system factors and clinic appointment-keeping.

A bivariate regression analysis was also performed in order to ascertain and confirm the results of the Pearson correlation analysis. In addition, it was also conducted to test the hypothesis of the study regarding the specific objective of assessing the relationship between health system factors and clinic appointment-keeping of government-aided secondary schools in Kampala.

Table 3: Model summary of teachers' professional development and clinic appointment keeping.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.271 ^a	.074	.069	.60450

a. Predictors: (Constant), Health system factors

Source: Primary data, 2025

Table 5 above shows the model summary of a bivariate linear regression of health system factors and clinic appointment-keeping, where the R^2 is 0.074, implying that health system factors account for 7.4% of the total variation in clinic appointment-keeping, and the remaining percentage is accounted for by other factors.

Table 4: ANOVA of health system factors and clinic appointment-keeping.

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	5.872	1	5.872	16.070	.000 ^b
	Residual	73.816	202	.365		
	Total	79.688	203			

a. Dependent Variable: Clinic appointment-keeping

b. Predictors: (Constant), Health system factors

Source: Primary data, 2025

Based on Table 6 above, the F-statistic of the regression analysis of health system factors and clinic appointment-keeping is 16.070 with its corresponding p-value of 0.000, which is smaller than 0.05 at the 5% level of significance. This implies that the regression model of health system factors and clinic appointment keeping is statistically a good fit in predicting the relationship between health system factors and clinic appointment keeping.

Table 5: Regression coefficients of health system factors and clinic appointment keeping

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.296	.332		6.920	.000
	Health system factors	.335	.084	.271	4.009	.000

a. Dependent Variable: Clinic appointment keeping

Source: Primary data, 2025

Hypothesis testing

H_0 : There is no significant relationship between health system factors and clinic appointment-keeping among children under five years of age at the outpatient care department of the ERRH Nutrition Unit.

H_1 : There is a significant relationship between health system factors and clinic appointment-keeping among children under five years of age at the outpatient care department of

the ERRH Nutrition Unit.

Based on Table 7 above, the standardized beta coefficient of health system factors, that is to say, 0.271, which is positive, implies that there is a positive relationship between health system factors and clinic appointment-keeping. In addition, the standardized beta coefficient of health system factors of 0.271 also reveals that a unit improvement in health system factors leads to a 0.271-unit improvement in clinic

appointment-keeping, and a unit decline in health system factors also leads to 0.271 unit decreases in clinic appointment-keeping, other factors constant. Furthermore, the corresponding p-value of the standardized beta coefficient of 0.271 is 0.000, which is smaller than 0.05 at the 5% level of significance, implying that the relationship between health system factors and clinic appointment-keeping is statistically significant at the 5% level of significance. Therefore, the null hypothesis which states that there is no significant relationship between health system factors and clinic appointment-keeping among children under five years of age at the outpatient care department of the ERRH Nutrition Unit is rejected and thus, the study concludes that there is a significant relationship between health system factors and clinic appointment-keeping among children under five years of age at the outpatient care department of the ERRH Nutrition Unit.

DISCUSSION.

The results of this study revealed a very weak but statistically significant positive relationship between health system factors and clinic appointment-keeping among children under five years of age at the ERRH Nutrition Unit. The Pearson correlation coefficient was 0.271 with a p-value of 0.000, while regression analysis showed that health system factors explained 7.4% of the variation in appointment-keeping. This means that although health system factors play a role in influencing attendance, their effect is relatively small compared to other determinants. These findings agree with Nakate (2023), who established that long waiting times discouraged attendance at follow-up visits in HIV and AIDS care. Similarly, Oliveira (2019) reported that large patient numbers and long delays at health facilities reduced appointment adherence, which is in line with the weak but significant effect found in this study. Thomas (2017) also observed that accessibility of health facilities and the availability of drugs were key motivators for clinic attendance, while staff shortages and insufficient patient information contributed to missed visits. This supports the present study's conclusion that aspects such as appointment scheduling, waiting times, and health worker communication can affect clinic attendance, though only modestly.

The results also echo those of Kalyango et al. 2014), who linked poor communication between patients and health workers to missed appointments among patients with chronic diseases. In addition, Sun (2021) highlighted the importance of reminders and shorter appointment intervals, which align with this study's implication that system-level improvements could enhance adherence. However, the weak association found in this research suggests that health system barriers, though real, are not the major predictors of missed appointments.

In light of these findings, the study suggests that while addressing health system challenges such as reducing waiting times, improving scheduling, and strengthening patient–health worker communication is important, these measures alone cannot sufficiently improve appointment adherence. A more holistic approach that combines health system improvements with socio-cultural and socio-demographic interventions is necessary to achieve significant progress in reducing defaulter rates at the ERRH Nutrition Unit.

Conclusion.

The study concluded that health system factors significantly influence clinic appointment-keeping among children under five years of age at the outpatient care department of the ERRH Nutrition Unit, albeit with a very weak positive effect. Specific factors such as long waiting times, inefficiencies in appointment scheduling systems, poor patient–health worker communication, and transport barriers were found to slightly affect adherence. Improvements in these areas—shorter waiting times, efficient scheduling, effective communication, and accessible transport were associated with slight increases in appointment-keeping, while challenges in these areas led to minor declines in attendance.

Recommendation.

To enhance clinic appointment-keeping, the hospital should focus on reducing waiting times through improved patient flow management and staff allocation. Appointment scheduling systems should be optimized with clear reminders, such as SMS notifications. Training health workers on effective patient communication can improve trust and adherence, while addressing transport barriers by providing information on affordable transport options or community support can further facilitate timely attendance.

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May God bless you immensely.

List of abbreviations.

ERRH - Entebbe Regional Referral Hospital
HIV - Human Immunodeficiency Virus
AIDS - Acquired Immunodeficiency Syndrome
SAM - Severe Acute Malnutrition
SMS - Short Message Service
SPSS - Statistical Package for the Social Sciences
RUTF - Ready-to-Use Therapeutic Food
WHO - World Health Organization

Source of funding.

The study received no external funding.

Conflict of interest.

The authors declare no conflict of interest

Data availability.

Data are available upon request from the author

Author contributions.

SHN: conceptualization, methodology, investigation, writing original draft.
DK: data curation, validation, supervision.
HN: data curation, visualization.
FS: validation, supervision.
AS: data curation, formal analysis.
JFN: supervision, validation.

Informed consent.

Written informed consent was obtained from all participants prior to their inclusion in the study. Participants were informed about the purpose of the study, procedures involved, potential risks and benefits, and their right to withdraw at any time without penalty.

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