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Health system factors influencing TB drug adherence among patients aged 15 to 35 years attending health services at Entebbe regional referral hospital, Wakiso district. A cross-sectional study.

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ABSTRACT

Background:

The study aimed to assess socio-demographic factors and explore health system-related factors influencing drug adherence among TB patients aged 15 to 35 years attending health services at Entebbe regional referral hospital, Wakiso district.

Methodology:

This study employed a descriptive cross-sectional quantitative design. A sample of 50 participants was determined using Barton's formula and selected through simple random sampling over a 10-day period, with five respondents recruited daily. Data were collected using pretested semi-structured questionnaires administered by the researcher in both English and Luganda. Data were analyzed manually using tally sheets and Microsoft Excel to generate frequencies and charts. Ethical approval was obtained, informed consent secured, and confidentiality strictly maintained throughout the study.

Results:

Out of 50 participants, 45 were enrolled, yielding a 90% response rate. The mean age was 30 years, with most respondents aged 31 to 35 years (44.44%), followed by 26 to 30 years (26.67%), 21 to 25 years (17.78%), and 15 to 20 years (11.11%). Regarding health system factors, 55.56% traveled from distant islands of Buvuma and Kalangala, 28.89% from Entebbe and Mpigi districts, and 15.55% lived near the hospital. Missed appointments were reported by 77.78%, attributed to long waiting times, poor communication, rudeness of health workers, and drug stockouts. Among those missing refills, 85.71% used herbal remedies. Only 10 respondents received follow-up calls or counseling, while 35 (77.78%) reported no guidance, follow-up sputum testing, or support on drug adherence.

Conclusion:

Poor TB drug adherence was associated with socio-economic, social, and health system challenges.

Recommendation:

Communities should provide social support and encouragement to TB patients throughout their treatment period to improve adherence.

Keywords: *Anti-TB drug, Tuberculosis, TB treatment adherence, socio-demographic factors, health system factors, patient-related factors*
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BACKGROUND OF THE STUDY

Socio-demographic and health system factors play a critical role in tuberculosis treatment adherence. Socio-demographic characteristics such as age, gender, education level, employment status, and socio-economic conditions influence patients' ability to access healthcare, understand the importance of completing treatment, and consistently take medication (Nidoi et al., 2021; Shinde, 2024; Mumbe et al., 2020).

Globally, studies in India and South Africa have shown that higher education, stable employment, and supportive family environments improve adherence, while personal

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obligations, early symptom relief, and lack of knowledge contribute to non-adherence (Zaidi et al., 2024; Shinde, 2024; VidyaRaj et al., 2025; Matakanye et al., 2021).

In Sub-Saharan Africa, low education, informal employment, rural residence, stigma, and gender norms—especially affecting women further compromise adherence (Dormechele et al., 2024; Kirubi et al., 2021; Kılıç et al., 2025; Anenmose Maro et al., 2024).

In Uganda, unsuccessful treatment outcomes are associated with poverty, informal employment, and lack of social support, drug stock-outs, and transportation challenges (Nidoi et al., 2021).

Health system-related factors, including availability and accessibility of services, quality of care, drug supply, diagnostic capacity, and healthcare worker support, significantly affect TB treatment adherence (Reddy et al., 2025; Tukamuhebwa et al., 2024).

Globally, inadequate facility capacity, lack of diagnostic tools, stock-outs, overcrowding, and poor patient tracking reduce adherence and contribute to treatment gaps and loss to follow-up (Jhaveri et al., 2024; Zago et al., 2021).

In Sub-Saharan and East Africa, long distances to clinics, insufficient health infrastructure, workforce shortages, and limited patient-centered care further hinder adherence (Mulaku et al., 2023; Kadia et al., 2021; Ooms et al., 2023; Ochieng et al., 2024).

In Uganda, rural health system barriers include limited human resources, stock-outs of TB consumables, inadequate funding, difficult terrain, and stigma, all negatively influencing treatment completion (Tukamuhebwa et al., 2024). The study aimed to assess socio-demographic factors and explore health system-related factors influencing drug adherence among TB patients aged 15 to 35 years attending health services at Entebbe regional referral hospital, Wakiso district.

METHODOLOGY

Study Design

The research used a descriptive cross-sectional design using a quantitative method of data collection, as this enabled the researcher to obtain diverse information at a single point in time, at less cost and within the shortest time possible.

Study Area

The study was conducted at Entebbe Regional Referral Hospital, located in Wakiso District. The hospital is a key urban public health facility that offers diagnostic, treatment, and follow- up services for TB patients. The hospital is a government facility that provides free services to new patients and follow-ups in the community of Entebbe, Mpigi District, Buvuma Islands, and Kalangala District, acting as a referral center for those areas, and provides services for local and international tourists.

Study Population

The study population was TB patients aged 15 to 35 years attending health services at Entebbe Regional Referral Hospital, Wakiso District, during the study period. Only patients who consented to the study were interviewed and recruited to participate in this study.

Sample Size Determination

A sample of 50 respondents was determined using Barton's formula.

n=QR/O where;

Q= Total number of days that were spent on data collection.

R = Maximum number of respondents worked on per day,

O = maximum time spent on each respondent.

n = (10x5)/1 n=50

Therefore, the sample size was 50 participants.

Sampling Technique

Respondents were selected using a simple random technique, and this was chosen because it gave all the respondents an equal chance to participate in the study with no bias.

Sampling Procedure

A simple random technique was used to get 50 respondents to participate in the study among patients. Chits containing even numbers were tossed, and 5 different patients each day who picked chits containing the even numbers were selected to participate in the study. The researcher conducted the study for 10 days.

Data collection technique

The study employed both self-administered and researcher-administered questionnaire techniques in the collection of data. This was used in order to make sure that every respondent is comfortable with the study and does not face challenges due to failure to interpret the questions.

Data collection tool(s)

A semi-structured, closed-ended questionnaire was used in

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data collection.

Data collection procedure

After obtaining consent from the respondents, the researcher fully explained the questions in the questionnaire to the respondents. For illiterate respondents, the researcher interpreted and translated English questions in the questionnaire into their local language[Luganda]. Self-administered and researcher-assisted questionnaires were used to collect data. Each filled questionnaire was thoroughly checked for accuracy and completeness by the researcher.

The interview lasted for 30-40 minutes to avoid loss of concentration from the correspondents.

Study variables

These included the independent and dependent variables.

Independent variables.

These included:

Socio-demographics such as age, sex, education, occupation, among others. Health system–related factors, for example, distance, availability, among others.

Dependent variables

These included:

Drug adherence among TB patients aged 15–35 years: Practices (uptake, adherence) attending Entebbe Regional Referral hospital

Quality control: Piloting of the study

The researcher visited the facility before the study, sought permission from the responsible people, checked on the conditions in the area to see if they were relevant to the research study, available research and information about the study from the patients at that facility. If the study area qualified for the research, the researcher later continued and carried out research in that facility.

Pretesting of the research tool

The questionnaire was pre-tested before data collection to ensure the correctness of the questions by the study assistants.

The respondents were trained before the pre-test by the researcher

The researcher also adhered to the standard operating procedure during the study to prevent variation and gain more experience to ensure the reliability and validity of the questions before the real research activity set off.

Inclusion criteria

Respondents of the study included all TB patients aged 15 to 35 years who came for health care services and consented to participate in the study.

Exclusion criteria

All those respondents who were not willing to consent and participate in the study were left out.

Data analysis and presentation

The data was analyzed immediately after data collection. Data was analyzed manually using tally sheets and using Microsoft Excel in the form of frequency distribution tables, pie charts, and bar graphs.

Data management

To ensure that there were no mistakes or uncovered areas, data editing was done accurately before leaving the field, and mistakes found were corrected before leaving the study area. The data obtained was stored in notebooks and a flash disk as a backup of data to avoid risks of data loss during report writing. Questionnaires were then kept in a safe locker under a key and lock until data analysis, for privacy and confidentiality.

Ethical considerations

The research topic was first approved by the research committee of Mildmay Institute of Health Sciences, then presented to the local council [LC1], who granted permission to the researcher to enter the community and also introduced the researcher to the health facility to conduct the study. Respondents consented before participating and filling the questionnaire by signing the consent form, and information on no incentive was provided to many respondents to be able to get data; then, the information was kept private and confidential.

RESULTS

Sociodemographic factors and characteristics of respondents

Out of the projected 50 respondents, the researcher managed to get 45 respondents in the stipulated research time, making a response rate of 90%.

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The mean age of respondents was 30, with most respondents (20) being between the 31-35 age bracket, making a percentage of 44.44%. 12 respondents (26.67%) were between 26 and 30 years
of age, 8 respondents (17.78%) were between 21-25 years of age, and 5 respondents (11.11%) were between 15-20 years of age.
The majority of the respondents were males, 30 (66.67%), and 15 respondents (33.33%) were females.
20 of the respondents were single (44.44%), 10 respondents (22.22%) were married, 3 of the respondents (6.67%) were divorced or separated from their partners, while 12 respondents (26.67%) were widowed.
Only 5 respondents (11.11%) reported having completed tertiary education, 8 (17.78%) respondents reported having completed secondary school, 15 (33.33%) respondents reported having attended part of primary school, while 17 (37.78%) respondents reported no education at all.
25 of the respondents (55.56%) were unemployed, 5 respondents (11.11%) were employed formally, and 15 respondents (33.33%) were employed informally, with most respondents reporting a monthly income of less than shillings three hundred thousand (300,000/=)

Table 1: Demographic factors and characteristics of the respondents (n= 45).

Variables	Category	Number (%)
Gender	Male	30 (66.67)
	Female	15 (33.33)
Age (Years)	15-20	5 (11.11)
	21-25	8 (17.78)
	26-30	12 (26.67)
	31-35	20 (44.44)
Marital status	Single	20 (44.44)
	Married	10 (22.22)
	Divorced	3 (6.67)
	Widowed	12 (26.67)
Socio-economic status	Unemployment	25 (55.56)
	Informal employment	15 (33.33)
	Formal employment	5 (11.11)

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Level of education	No education	17 (37.78)
	Primary	15 (33.33)
	Secondary	8 (17.78)
	Tertiary	5 (11.11)

Health system-related factors influencing drug adherence among respondents

Majority of the respondents reported to be coming far from the health facility with 25 (55.56%) respondents reporting to be coming from the islands of Buvuma and Kalangala where transport means are expensive and unreliable with the fact, they are greatly affected by weather changes and time of the day. 13 of the respondents (28.89%) reported to be coming from around the areas of Entebbe and Mpigi districts where there is also poor road network which makes movement to and from the hospital hard and expensive. 7 (15.55%) of the respondents reported coming from areas around the hospital where they can easily walk to the health facility. 35 respondents (77.78%) reported to have missed out on several hospital appointments and drug refills explaining that this was because of the long waiting hours in ques at the health facility while waiting to be reviewed and assessed, rudeness of the health workers, poor or no communication about return dates from the health workers and healthcare providers and also drug stock outs at the health facility. Of these, 30 respondents (85.71%) reported having used herbal remedies on occasions when they missed out on drug refills, and 5 of them (14.29%) reported not having used any herbal remedy or any other alternative when they missed out on drug refills.

Only 10 respondents reported having been followed up via phone calls or text messages and having been counseled about drug adherence. 35 of the respondents reported not having been followed up, counseled, or guided by the health workers on the advantages and disadvantages of drug adherence. These patients also reported not having had a follow-up sputum testing or Xpert during the course of their treatment.

Figure 1: Accessibility to the hospital by the respondents.

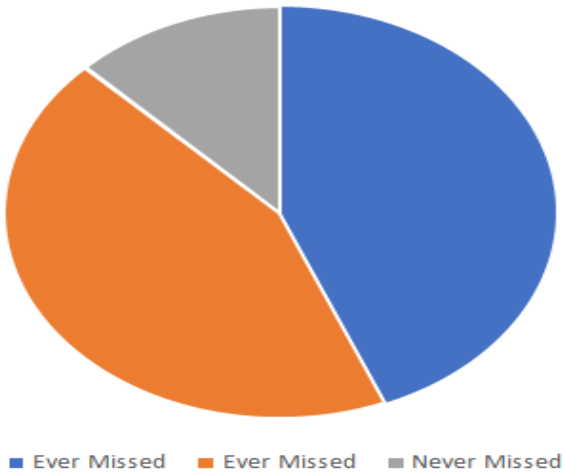

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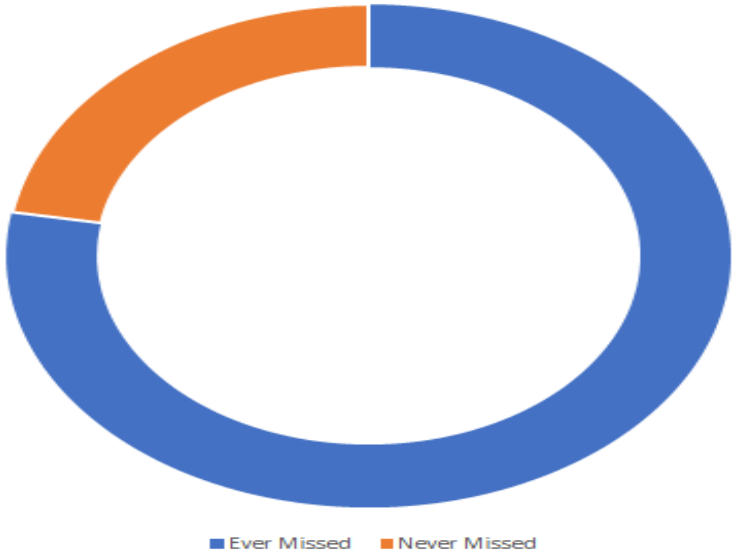
Figure 2: Respondents with missed and unmissed hospital appointments.



DISCUSSION

Demographic factors and characteristics of respondents

The mean age of respondents was 30, with most respondents (20) being between the 31-35 age bracket, indicating more prevalence in this age group. Most of the participants were single, divorced, or widowed males. This predisposed them to less care, less encouragement, and little or no support towards their adherence to TB drugs, hence reducing drug adherence among them.

Majority of the respondents (17) reported not to have attended school while 15 reported to have attended at least primary school and 8 respondents reported to have studied to secondary school and only 5 respondents had attended tertiary institutions, this was found to be a major hinderance to adherence due to lack or no knowledge about the disease, long-term treatment goal and impacts of adherence. This was also found to be associated with high levels of misconceptions and misbeliefs about the disease, hence reducing drug adherence.

Most of the respondents (55.56%) were unemployed, and those who were employed reported a low monthly income. This hindered their accessibility to the hospital since most could not afford transport costs thus low adherence. Low economic status also reduced individual access to the basic needs of life, like food and other essentials, which in turn contributed to low drug adherence.

Health system-related factors influencing adherence among respondents.

With a high number of respondents (25) reporting to be residing in the remote areas of Buvuma and Kalangala islands, where transportation to and from the hospital is hard and hindered by the unreliable and expensive transport system, it was found that this hindered access to medical care making many to miss out on their drug refills and appointments at the hospital and also exposed them to less updated medical knowledge hence an increase in drug non-adherence.

With a high incidence of drug stockouts and long waiting hours at the hospital, many respondents reported having resorted to using herbal remedies during the time of stockouts. This was found to be a big hindrance to TB drug adherence. Many respondents (35) reported no follow-up

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and rudeness from the health workers at the hospital. This was found to discourage many from returning to the hospital for further management and assessment, hence hindering drug adherence.

CONCLUSION

Adherence to TB drugs among patients aged 15–35 years attending Entebbe Regional Referral Hospital was poor and was significantly associated with low socio-economic status, male gender, low level of education, being single, lack of social support, drug stock-outs at the hospital, long waiting times, and inaccessibility to the health facility.

Study Limitations

The questions in the questionnaire were written in simple English for them to be understood by each and every respondent.

RECOMMENDATION

Communities should provide social support and encouragement to TB patients throughout their treatment period to improve adherence.
Individuals should adopt positive attitudes towards TB treatment and comply fully with prescribed regimens.
Community sensitization should be strengthened to increase awareness about the importance of TB drug adherence.
Health workers should increase counselling services to clarify treatment goals, expectations, and possible side effects.
The hospital should strengthen follow-up mechanisms for TB patients to improve adherence.
The government should allocate more health workers to reduce waiting time at the facility.
The infrastructure should be improved to enhance accessibility to the hospital.
A consistent supply of TB drugs should be ensured to prevent stock-outs.

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LIST OF ABBREVIATIONS

Abbreviation	Full Form
TB	Tuberculosis
ART	Antiretroviral Therapy
LC1	Local Council One
n	Sample size / Number of respondents
%	Percentage
Xpert	Xpert MTB/RIF assay (Molecular TB diagnostic test)
Min	Minutes
Shs	Ugandan Shillings

SOURCE OF FUNDING

The study received no external funding.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY

Data is available upon request from the author.

AUTHOR BIOGRAPHY

Perpetua Nabayigga is a student pursuing a diploma in clinical medicine and community health at Mildmay Institute of Health Sciences

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AUTHOR CONTRIBUTIONS

PN: collected the data.
TM: supervised the study.
FS: supervised the study.
HN: supervised the study.
JFN: supervised the study

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