

Prevalence of pyuria among pregnant mothers attending antenatal care at Kajjansi Health Centre IV. A cross-sectional study.

Eria Paul Gwayambadde*, Johnson Bwambale, Hasifa Nansereko, Francisco Ssemuwemba, Jane Frank Nalubega, Anthony Ssekitoleko
Mildmay Institute of Health Sciences

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ABSTRACT

Background:

The study aimed to assess the prevalence of pyuria among pregnant mothers attending antenatal care at Kajjansi Health Centre IV.

Methodology:

A descriptive cross-sectional quantitative study was conducted among 88 pregnant mothers attending antenatal care at Kajjansi Health Centre IV, Wakiso District. Participants were selected using simple random sampling through the lottery method. Data were collected using a pretested interviewer-administered questionnaire and laboratory examination of urine samples by microscopy. Ethical approval, informed consent, confidentiality, and voluntary participation were ensured throughout the study.

Results:

The prevalence of pyuria is 35.2%. All 88 participants participated, yielding a 100% response rate. Respondents' ages were distributed across four groups. The largest proportion were aged 21–30 years, comprising 40 (45.5%) participants, followed by those aged 31–40 years, 28 (31.8%). Participants aged 17–20 years accounted for 12 (13.6%), while 8 (9.1%) were aged above 40 years.

Conclusion:

Prevalence of pyuria among pregnant mothers attending antenatal care at Kajjansi Health Centre IV was high, indicating that pyuria is a common condition in this population.

Recommendation:

The healthcare providers should prioritize early diagnosis and appropriate treatment of pyuria and urinary tract infections to prevent complications during pregnancy.

Keywords: Urinalysis, Urinary inflammation, Pregnancy, Antenatal screening, Maternal health, Urinary abnormalities.

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Corresponding author: Eria Paul Gwayambadde

Mildmay Institute of Health Sciences

Background of the study

Pyuria, characterized by the presence of an increased number of white blood cells in urine, is a common laboratory finding among pregnant women and may indicate urinary tract inflammation or infection. Pregnancy-related physiological changes can increase susceptibility to urinary tract abnormalities, making routine antenatal urine screening important for early detection. Globally, a study conducted in China reported a prevalence of asymptomatic pyuria of 21.3% among pregnant women. Pyuria was significantly associated with adverse pregnancy outcomes, including preterm delivery before 36 weeks of gestation, premature rupture of membranes, and low birth weight. It was also identified as an independent predictor of poor neonatal outcomes, including low 5-minute Apgar scores, particularly among women of advanced maternal age (Lai et al., 2017).

In Africa, the prevalence of pyuria varies considerably across populations and settings. A study conducted at Tamale Central Hospital and Tamale Teaching Hospital in Ghana reported sterile pyuria among 66% of women evaluated for urinary abnormalities (Karikari et al., 2020). The presence of pyuria despite negative bacterial cultures suggests that urinary inflammation may occur due to causes other than routinely detectable bacterial infections. The high prevalence reported in Ghana demonstrates the importance of urine microscopy and appropriate investigation of urinary abnormalities among pregnant women.

In Uganda, hospital-based evidence also indicates that pyuria is a considerable problem among pregnant women. A study at Mbarara Regional Referral Hospital reported pyuria in 35% (140/400) of urine samples with positive urine culture results (Johnson et al., 2021). Gram-negative organisms, particularly *Klebsiella pneumoniae* and

Escherichia coli, were commonly isolated, while *Staphylococcus aureus* was the most frequent gram-positive organism. These findings indicate that pyuria may frequently reflect underlying urinary tract pathology among pregnant women.

The occurrence of pyuria is also influenced by the socio-demographic characteristics of pregnant women. Age, education, marital status, residence, and occupation may affect exposure to urinary tract infections, hygiene practices, health knowledge, and access to healthcare. For example, a study at Hoima Regional Referral Hospital reported that 48.0% of pregnant women were aged above 30 years, 34.5% were aged 20–29 years, and 17.5% were below 19 years (Frank, 2017). Therefore, this study aimed to assess the prevalence of pyuria among pregnant mothers attending antenatal care at Kajjansi Health Centre 1V.

Methodology

Study design and rationale

A descriptive cross-sectional study design using quantitative methods was employed to assess the prevalence of pyuria among pregnant women.

Study area

The study was conducted at Kajjansi Health Centre 1V in Wakiso District, which is in the central region of Uganda, encircling Kampala, the capital city. Specifically, it lies 20km northwest of Kampala along the highway to Entebbe. The facility has both medical and non-medical departments; thus, medical officers, clinical officers, pharmacists, sonographers, dentists, laboratory technicians, midwives, enrolled nurses, and cleaners and security guards are among the non-medical department.

Study population

The study population consisted of pregnant mothers attending Antenatal care at Kajjansi Health Centre IV in Wakiso District.

Selection criteria

Inclusion criteria

Pregnant mothers who consented and were available at the time of the study at Kajjansi Health Centre were included to participate in the study, and those who knew how to read and understand English.

Exclusion criteria

Pregnant mothers who withdrew from the study.
Pregnant mothers who did not know how to read and understand English.

Sample size determination

According to the Kish and Leisley formula, the sample size n was determined by,

$$n = \frac{Z^2 PQ}{d^2}$$

Where;

n = desired sample size

Z = the standard normal deviation (1.96) at the 95% confidence level

d = margin of error (0.05)

p = estimated prevalence of pyuria, where p is 0.35 (Johnson *et al.*, 2021)

q = $1-p$

Therefore, $n = 1.962 \times 0.35 \times \frac{(1-0.35)}{0.05^2}$

$$n = \frac{0.873964}{0.0025}$$

$$n = 349.5856$$

$$n = 350$$

Since the population is finite, a correction factor was applied:

$$N = 350 / 4 = 88 \text{ participants}$$

$$= 350 \times 1/4$$

$$= 87.5$$

$$= 88 \text{ participants}$$

Therefore, 88 participants were involved in the study.

Sampling technique

Simple random sampling using the lottery method was used to ensure equal chances of selection among participants.

Sampling procedure

The study population was selected using a simple random technique, using the lottery method until the required sample size of eighty-eight participants was reached.

A sampling frame of all eligible participants was compiled prior to data collection. Each day, twelve identical folded papers were prepared, whereby eleven papers were numbered sequentially according to the remaining sample needed, and one paper was marked with a letter. The papers were placed in an opaque container and thoroughly mixed before each session.

Eligible participants present were asked to draw one paper without replacement. Only individuals who selected numbered papers were enrolled. Participants who drew the lettered paper were thanked and excluded. A record of all selected numbers was maintained to avoid duplication. This daily procedure continued until eighty-eight participants were enrolled.

Data Collection Method

Data were collected using an interviewer administered questionnaire and laboratory investigation of urine samples. A structured, pretested questionnaire was administered to collect sociodemographic data and information on factors contributing to pyuria.

Urine samples of participants were collected in a sterile container following instructions; samples were examined by microscopy at Kajjansi Health Centre IV laboratory.

Data collection tools

The following tools were used to collect data;

A structured, pretested questionnaire was used to collect data from participants. It consisted of closed-ended questions divided into parts;

Part One: sociodemographic factors contributing to pyuria

Part Two: prevalence

Laboratory materials including sterile, wide-mouthed urine containers for collecting urine samples.

Laboratory request forms for recording participant identification and tests requested.

Microscope and glass slides for urine sediment examination.

Laboratory register for recording results.

Data collection procedure

Permission was first obtained from the administration of Kajjansi Health Centre IV, followed by ethical clearance from the institutional research committee. Data collection was conducted during Antenatal care clinic days, where pregnant mothers attending ANC were approached; the purpose of the study was explained, and written informed consent was obtained from those who were willing to participate.

Questionnaires were administered to consented participants. Each participant was instructed on how to collect urine samples, and urinalysis was done on the samples. Results were recorded in the data extraction form.

Quality control

The questionnaire forms were thoroughly checked for completeness, consistency, accuracy, and clarity of questions and responses before respondents left the study area. This ensured that the completed questionnaires met the required standards of a good data collection tool.

The development of the research report was supervised by a supervisor with technical expertise in the study area to ensure that an accurate, objective, and goal-oriented report was developed using an appropriate methodology.

During data collection, data collectors were supervised, and all activities were reviewed daily to identify errors and

omissions. Field challenges were discussed on a daily basis, and appropriate strategies were developed to facilitate effective data collection on subsequent days.

Research assistants were trained in data collection techniques, including the proper interpretation and administration of the questionnaire.

During data collection, respondents were encouraged to wear face masks as a precautionary measure against the spread of airborne diseases.

The study area was visited before the commencement of data collection to familiarize the data collection team with the study setting. Data were collected over an adequate period to minimize potential bias and enhance the reliability of the findings.

A pre-test was conducted among pregnant mothers attending antenatal care at Kajjansi Health Centre IV, after which necessary modifications were made to the data collection tool. This helped to improve the validity, clarity, applicability, and completeness of the tool. Findings from the pre-test were not included in the main study.

A pilot study was conducted at Mildmay Hospital involving about 10% of the total sample size. This helped to test the tools and the procedures involved in the study and improve overall data from the study before the main study began.

Data analysis and presentation

Data were cleaned to ensure completeness, consistency, and accuracy.

Data were then entered and analyzed by a computer package known as SPSS (version 23.0). The findings were then presented in tables, charts, graphs, and narratives.

During data interpretation, the results were thoroughly explained and discussed based on the information presented.

Ethical consideration.

Ethical approval was obtained from the institutional review board. Written informed consent was obtained from participants. Confidentiality was maintained using codes instead of names, and participation was voluntary.

RESULTS

Response Rate

A total of 88 pregnant mothers were targeted for the study, and all 88 participated, giving a response rate of 100%.

Socio-demographic characteristics of respondents.

Table 1: Age distribution of respondents (n = 88)

Age group (years)	Frequency (f)	Percentage (%)
17–20	12	13.6%
21–30	40	45.5%
31–40	28	31.8%
Above 40	8	9.1%

Interpretation: Most respondents were aged 21–30 years (45.5%), indicating that the majority were within the active reproductive age group.

Table 2: Marital status of respondents

Marital status	Frequency	Percentage
Single	10	11.4%
Married	64	72.7%
Divorced/Separated	8	9.1%
Widowed	6	6.8%

Interpretation: The majority (72.7%) were married, which may increase exposure to factors like sexual activity linked to UTIs.

Table 3: Level of education

Education level	Frequency	Percentage
No formal	6	6.8%
Primary	30	34.1%
Secondary	38	43.2%
Tertiary	14	15.9%

Prevalence of Pyuria

Table 4: Prevalence of pyuria (n = 88)

Pyuria status	Frequency	Percentage
Present	31	35.2%
Absent	57	64.8%

Interpretation: The prevalence of pyuria among pregnant mothers was 35.2%, indicating that more than one-third of participants had pyuria.

DISCUSSION

Socio-demographic factors contributing to pyuria

The study revealed that most respondents were aged 21–30 years, which is the most active reproductive age group. Although pyuria occurred across all age groups, women in this age category were more affected, possibly due to increased sexual activity and physiological susceptibility during pregnancy, consistent with findings from the Hoima and Mbarara studies. (Frank, 2017; Kara et al., 2025; Enzo et al., 2024; Getaneh et al., 2021).

Marital status also appeared to influence the occurrence of pyuria, with the majority of respondents being married (72.7%). This may increase exposure to urinary tract infections due to frequent sexual activity, which is a known risk factor.

Education level was another important factor. Respondents with lower levels of education (primary level) showed a higher occurrence of pyuria compared to those with higher education, as reported in Ethiopia and Uganda. (Haque & Rahman, 2022; Oladeinde et al., 2020). This could be due to limited knowledge about hygiene practices and infection prevention. (Frank, 2017; Kara et al., 2025).

Place of residence also played a role, with many respondents coming from peri-urban areas, where access to clean water and sanitation may be inconsistent, thereby increasing the risk of infections. (Enzo et al., 2024).

Prevalence of pyuria among pregnant mothers

The study found that the prevalence of pyuria among pregnant mothers attending antenatal care at Kajjansi Health Centre IV was 35.2%. This indicates that more than one-third of the respondents had pyuria.

This finding is consistent with studies conducted in Uganda and other developing countries such as Ethiopia, where prevalence rates ranging between 30% and 35% have been reported. (Johson et al., 2021; Awoke, 2021; Tchente et al., 2021). For example, a study at Mbarara Regional Referral Hospital reported a prevalence of about 35%, which is similar to the findings of this study.

The relatively high prevalence observed in this study may be attributed to factors such as poor hygiene practices, limited awareness about urinary tract infections, and physiological changes during pregnancy that predispose women to infections.

Conclusion

The study established that the prevalence of pyuria among pregnant mothers attending antenatal care at Kajjansi Health

Centre IV was high (35.2%), indicating that pyuria is a common condition in this population.

Recommendation

The healthcare providers should strengthen routine screening for pyuria among pregnant mothers attending antenatal care at Kajjansi Health Centre IV to facilitate early identification and management.

The healthcare providers should prioritize early diagnosis and appropriate treatment of pyuria and urinary tract infections to prevent complications during pregnancy.

The Ministry of Health and health authorities should develop policies and guidelines that strengthen routine urine screening for pyuria as part of antenatal care services.

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List of abbreviations

ANC - Antenatal care

IV - Four

SPSS - Statistical Package for the Social Sciences

UTI - Urinary tract infection

WHO - World Health Organization

IRB - Institutional Review Board

Source of funding

The study had no funding.

Conflict of interest

The authors declare no conflict of interest.

Data availability

Data are available upon request from the author.

Author contributions

EPG: conceptualization, methodology, investigation, writing original draft.

JB: data curation, formal analysis, Supervision.

HN: data curation, formal analysis, visualization.

FS: supervision, validation

JFN: supervision, validation

All authors: approved the final version of the manuscript and agreed to be accountable for the work

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.

Author biography

Eria Paul Gwayambadde: a student pursuing a diploma in medical laboratory technology at Mildmay Institute of Health Sciences.

Johnson Bwambale: research supervisor at Mildmay Institute of Health Sciences.

Hasifa Nansereko: research supervisor at Mildmay Institute of Health Sciences.

Francisco Ssemuwemba: research supervisor at Mildmay Institute of Health Sciences.

Jane Frank Nalubega: research supervisor at Mildmay Mildmay Institute of Health Sciences.

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