Dissertation Training Report

at

JHPIEGO

KNOWLEDGE AND ATTITUDE REGARDING ASYMPTOMATIC BACTERIURIA AMONG HEALTHCARE PROVIDERS- RAJASTHAN, INDIA

by

ROHIT SINGH DHINGRA

PG/22/95

Under the guidance of

Dr Ekta Saroha

PGDM (Hospital & Health Management)

2022-24

International Institute of Health Management Research New Delhi

The certificate is awarded to.

Rohit Singh Dhingra

in recognition of having successfully completed his internship in the department of

Monitoring and Evaluation

and has successfully completed his Project on

Knowledge and Attitude regarding Asymptomatic Bacteriuria among healthcare providers-Rajasthan, India

Date: 31 May 2024

Jhpiego
(Johns Hopkins Program for International Education in Gynecology and Obstetrics)

He comes across as a committed, sincere & diligent person who has a strong drive & zeal for learning.

We wish him all the best for future endeavors.

Training & Development

Zonal Head-Human Resources

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Rohit Singh Dhingra** student of PGDM (Hospital & Health Management) from the International Institute of Health Management Research, New Delhi has undergone internship training at **Jhpiego** from 1 March, 2024 to 30 June, 2024.

The Candidate has successfully carried out the study designated to his during internship training and his approach to the study has been sincere, scientific, and analytical.

The Internship is in fulfillment of the course requirements.

I wish him all success in all her future endeavors.

Dr. Sumesh Kumar
Associate Dean, Academic and Student Affairs
IIHMR, New Delhi

Mentor

IIHMR, New Delhi

Certificate of Approval

The following dissertation titled **"KNOWLEDGE AND ATTITUDE REGARDING ASYMPTOMATIC BACTERIURIA AMONG HEALTHCARE PROVIDERS-RAJASTHAN, INDIA"** at **"JHPIEGO"** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation.

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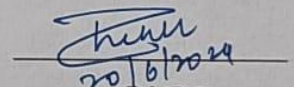
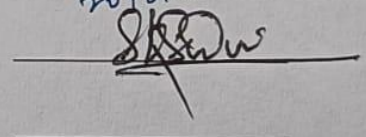
Dr Puneet Chahal	
Dr. Sumant Swain	

Certificate from Dissertation Advisory Committee

This is to certify that **Mr. Rohit Singh Dhingra,** a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. He is submitting this dissertation titled **"Knowledge and Attitude regarding Asymptomatic Bacteriuria among healthcare providers-Rajasthan, India"** at **"JHPIEGO"** in partial fulfillment of the requirements for the award of the **PGDM (Hospital & Health Management).**

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report, or book.

Institute Mentor Name – DR. Ekta Saroha

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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled

KNOWLEDGE AND ATTITUDE REGARDING ASYMPTOMATIC BACTERIURIA AMONG HEALTHCARE PROVIDERS-
RAJASTHAN, INDIA

and submitted by

ROHIT SINGH DHINGRA

Enrollment No. PG/22/95

under the supervision of

Dr Ekta Saroha

for award of PGDM (Hospital & Health Management) of the Institute carried out during the period from 2022 to 2024

embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Signature

FEEDBACK FORM

Name of the **Student:** Rohit Singh Dhingra

Name of the **Organization in Which Dissertation Has Been Completed: Jhpiego** (*Johns Hopkins Program for International Education in Gynecology and Obstetrics*)

Area of **Dissertation:** Monitoring and Evaluation under various health programs.

Attendance: 1st March – 1st June

Objectives achieved: Rohit has completed within the given timeline and achieved all assigned deliverables.

Deliverables:

1. To establish **Resource Availability tracking mechanism in 7500 SC and HWC facilities** across 9 **States under ANC quality strengthening program.**
    - Identification of 28 key vital resources which are needed to ensure the quality ANC services up to community level institutes.
    - Developed Resource Availability Data Collection Tool on ODK to check and ensure the resources available at community level institute across 9 states.
    - Data reporting mechanism achieved from 3500+ facilities till date.
    - Designed and Development of Resource Availability Matrix and ensured weekly tracking and shared it with respective Program Team.
2. Insight paper **on supply chain management and procurement processes, detailing the landscape of available resources and conducting a bottleneck analysis in 3 Indian states under the ANC Quality Strengthening Program.**
    - Designed checklist for Program Officers to ensure supply chain process compliance.
    - Designed Gap Matrix by comparing supply chain flow of 3 states.
    - Field visits "To support the field team in process of intending and ensuring resources availability in facilities".
    - Gathered Insights, Gaps and Flow of the supply chain processes of healthcare resources by conducting interviews with various stakeholders, including Community Health Officers, Pharmacists, District Store Managers, and Jhpiego's program team members from each state.
    - Developed Reports, Presentations, and Documents on gap analysis module.
3. To assess **knowledge and Attitude among healthcare providers regarding Asymptomatic Bacteriuria -Rajasthan**
    - Questionnaire formation and CAPI tool development on ODK for provider competency assessment on Knowledge and Attitude on ASB.
    - Conducted orientation/training session for Jhpiego program team.
    - Field visits to collect the data.
    - Conducted knowledge attitude test of trained healthcare providers (ANM, NURSES and MO's) on Asymptomatic Bacteriuria.

- Descriptive Data Tabulation, classification, and analysis.

4. Routine work **in Monitoring and Evaluation department.**
   - Conducted data analysis, data rectification and Resource matrix formation for Born Healthy 2.0 program across 9 states.
   - Developed reports, presentations, and documents on gap analysis module.
   - Developed SOP for RDQA (Routine Data Quality Assessment) for Born Healthy 2.0 program.
   - Field Visits for Facility assessment.
   - Perform various tasks assigned by Jhpiego MER team.

Strengths: He has is very hard working and sincere. He has good knowledge of understanding of Hindi.

Suggestions for Improvement:

He needs to read and learn more about different domains of public health and explore more field experience

Suggestions for Institute (course curriculum, industry interaction, placement, alumni):

—

Signature of the Officer-in-Charge/ Organization Mentor (Dissertation)

Dr C S Jodi

Date: 1st June 2024

Place: Jaipur (Rajasthan)

“To determine the prevalence of anxiety and depression in the geriatric population, Delhi, India”

ABSTRACT

Introduction

Asymptomatic bacteriuria (ASB) is characterized by the continuous presence of bacteria (colony count =10^5/ml) in the urinary tract without any noticeable symptoms. It is observed in 2-14% of pregnancies. Globally, approximately 1.9%–9.5% of pregnancies are impacted by asymptomatic bacteriuria. Among pregnancies affected by asymptomatic bacteriuria, which make up approximately 1.9% to 9.5% of the estimated 213 million pregnancies globally (4) each year, around 8.6% to 13.6% result in preterm birth, and 6.9% to 20.5% result in low birth weight (LBW). The objective of my study is to evaluate the effectiveness of these training programs by assessing the second post-training knowledge and attitudes of healthcare professionals regarding asymptomatic bacteriuria.

Methods

A cross-sectional study was done in districts of Rajasthan. All the participants of the ASB training done by Jhpiego were included. Consent was taken by the nurses, doctors and ANMs before collecting the data. Data was collected using a semi-structured questionnaire including demographic details and knowledge, and attitude regarding ASB in 309 healthcare providers. Data was analysed using Microsoft Excel and SPSS version 22.

Results

The overall knowledge prevalence of the research participants was 81% in the study. The overall knowledge assessment was categorized into three subgroups: Knowledge of urinary tract infections, risk factors, and diagnostic tests; Knowledge of clinical management and risk factors; and Knowledge of healthcare and screening guidelines. The assessment was conducted based on the facility. The average mean of the participants' knowledge of the three subgroups was 70%, 82%, and 92% respectively. Healthcare providers demonstrated a predominantly positive attitude towards ASB, with 90.4% expressing favorable views.

Conclusion

Doctors, nurses, and ANMs are well-informed about ASB and its potential consequences if left untreated. This knowledge is attributed to their participation in "Vatsalya" training and conferences regularly conducted by JHPIEGO, which keeps them updated on recent advancements. However, there is a need to enhance awareness of ASB among healthcare professionals across all districts in Rajasthan and eventually throughout all states in India.

ACKNOWLEDGEMENT

I would like to express my heartfelt gratitude to **IIHMR Delhi** for providing me with the invaluable opportunity to undertake my dissertation. I am particularly thankful to the Placement Cell for facilitating my association with Jhpiego, which has significantly enriched my learning experience.

I extend my deepest appreciation to **Dr. Ekta Saroha**, my mentor at IIHMR Delhi, for her constant support, insightful guidance, and encouragement throughout this journey. Her expertise and dedication have been instrumental in the successful completion of my dissertation.

I am immensely grateful to Dr. Chandra Shekhar Joshi, Mr. Manish Chotiya, and Dr. Yashpal Jain from Jhpiego for their unwavering guidance and support. Their valuable inputs and mentorship have been crucial in shaping the direction and outcomes of this research.

Lastly, I would like to thank my family, friends, and colleagues for their continuous encouragement and support during this academic endeavor.

Thank you all for your contributions, without which this dissertation would not have been possible.

Table of Contents

List of Tables

List of Symbols and Abbreviations

1. ANMs- Auxiliary Nurse Midwives
2. ASB- Asymptomatic bacteriuria
3. IDSA- Infectious Diseases Society of America
4. LBW- Low Birth Weight
5. MOs- Medical Officers
6. UTIs- Urinary Tract infections

KNOWLEDGE AND ATTITUDE REGARDING ASYMPTOMATIC BACTERIURIA AMONG HEALTHCARE PROVIDERS- RAJASTHAN, INDIA

Introduction

Asymptomatic bacteriuria (ASB) is characterized by the continuous presence of bacteria (colony count =10^5/ml) in the urinary tract without any noticeable symptoms. It is observed in 2-14% of pregnancies. (1)

During pregnancy, women are more susceptible to asymptomatic bacteriuria due to anatomical and functional changes in the urinary tract, as well as a decrease in immune function. (2, 3) Globally, approximately 1.9%–9.5% (4) of pregnancies are impacted by asymptomatic bacteriuria. This condition is more often caused by Gram-negative bacteria such as Escherichia coli, Klebsiella, Proteus, and Pseudomonas than by Gram-positive bacteria like Streptococcus, Staphylococcus, and Enterococcus. (5)

Asymptomatic bacteriuria is a common clinical finding. In infants and toddlers, its prevalence is less than 0.5%, but this rate increases with age. Among healthy premenopausal women, the incidence is 5% or lower, while it rises to 15% or more in women and men aged 65-80 years. After the age of 80, the prevalence further escalates to as high as 40% to 50% among residents of long-term care facilities. Across all age groups, females show a higher incidence of asymptomatic bacteriuria than males. The most frequently identified bacterium in asymptomatic bacteriuria is Escherichia coli. (6)

If asymptomatic bacteriuria in pregnancy goes undetected and untreated, it can result in various adverse outcomes, either subtly or by developing into symptomatic urinary tract infections (UTIs). For the mother, it can cause preterm labor, hypertensive pregnancy disorders, preterm premature rupture of membranes, anemia, postpartum endometritis, and acute pyelonephritis. For the baby, it can lead to intrauterine growth retardation, prematurity, low birth weight, and perinatal mortality. (7) Prematurity impacts 15 million babies worldwide each year and accounts for at least 50% of all neonatal deaths. Even if these children survive, they may face lifelong physical, neurodevelopmental, behavioral, or learning disabilities. The cost of long-term care imposes significant economic, emotional, and psychosocial burdens on their families. (8)

Among pregnancies affected by asymptomatic bacteriuria, which make up approximately 1.9% to 9.5% of the estimated 213 million pregnancies globally (4) each year, around 8.6% to 13.6% result in preterm birth, and 6.9% to 20.5% result in low birth weight (LBW). (8, 9) Early diagnosis and treatment of asymptomatic bacteriuria can lower the risk of preterm birth by 73% and reduce low birth weight (LBW) by 36%. (10) This could potentially prevent 0.25 to 2 million preterm births and 0.1 to 1.5 million LBW babies worldwide each year, and 57,375 to 453,660 preterm births and 22,701 to 337,229 LBW cases in India annually.

Diagnosing and treating asymptomatic bacteriuria is crucial because it is associated with several fetal and maternal complications, including acute pyelonephritis, hypertension, anemia, preterm labor, low birth weight infants, and intrauterine growth restriction. (11, 12, 13) If left untreated, asymptomatic bacteriuria is associated with acute pyelonephritis in as many as 20–50% of women. (14) Urinary tract infection (UTI) is common during pregnancy and is associated with maternal and perinatal morbidity and

mortality. (15) Women with ASB in pregnancy are more likely to deliver preterm and have low birthweight neonates. (16)

Rationale:

Jhpiego Jaipur has conducted comprehensive training sessions for Auxiliary Nurse Midwives (ANMs), Medical Officers (MOs), and nurses across Bundi, Dhaulpur, Karauli, and Udaipur districts of Rajasthan, focusing on the understanding and management of asymptomatic bacteriuria. The objective of my study is to evaluate the effectiveness of these training programs by assessing the second post-training knowledge and attitudes of healthcare professionals regarding asymptomatic bacteriuria.

Through structured surveys and interviews, the study aims to gauge the extent to which the training has enhanced participants' understanding of asymptomatic bacteriuria and influenced their attitudes toward its management. This evaluation will provide valuable insights into the impact of the training initiatives, potentially informing future educational efforts in this crucial area of healthcare.

Understanding the knowledge and attitude of healthcare providers regarding ASB is essential for improving patient care and outcomes. Identifying gaps in knowledge and practices can inform targeted interventions, such as educational programs and policy changes, to enhance ASB management. Given the lack of studies in this area in Rajasthan, this research fills a crucial gap in the literature and contributes to the development of evidence-based strategies for ASB prevention and control in the region.

Objectives:

General Objective:

To assess the Knowledge and Attitude regarding asymptomatic bacteriuria among healthcare providers in districts of Rajasthan, India.

Specific Objectives:

a) To evaluate the level of knowledge among healthcare providers in Rajasthan regarding asymptomatic bacteriuria, including its definition, risk factors, and clinical significance.

b) To examine healthcare providers' awareness of the recommended management and treatment strategies for asymptomatic bacteriuria, including indications for antibiotic therapy and non-pharmacological interventions.

c) To explore healthcare providers' attitudes and beliefs regarding the significance of asymptomatic bacteriuria in clinical practice, including perceptions of its impact on patient outcomes and healthcare resources.

Methodology

- ✓ **Study design-** This study utilized a cross-sectional design to assess the knowledge, attitude, and practices among healthcare providers regarding ASB.

- ✓ **Study period-** 3 months (March-June)

- ✓ **Study population**- The study population includes nurses, doctors, and ANMs working in various healthcare facilities, such as hospitals and clinics, across selected districts of Rajasthan.

- ✓ **Inclusion criteria:**
    - Healthcare providers (Nurses, Doctors, and ANMs) currently practicing in selected healthcare facilities.
    - Willingness to participate in the study.
    - Healthcare providers (Nurses, Doctors, and ANMs) trained by Jhpiego, Jaipur on the management of ASB.

- ✓ **Exclusion criteria:**
    - Healthcare providers unwilling to participate in the study.

- ✓ **Sampling technique**- Convenient Sampling

✓ **Sample size estimation-**

The prevalence of ASB Knowledge among Doctors, Nurses, and ANMs in the first post-training assessment was found to be 61% as shared by Jhpiego, Jaipur.

Healthcare Providers	Number of Healthcare Providers
Doctors	141
ANMs	1788
Nurses	17
Total Population Trained (N)	**1946**

Table 1: Distribution of Healthcare workers who took ASB training from Jhpiego

The formula for sample size considering a finite population:

n = (z^2 * p(1-p) * N) / (e^2 * (N-1) + z^2 * p(1-p))

n = sample size for each district

z = z-statistic for a 95% confidence level (1.96)

p = Assumed prevalence (0.61)

e = Margin of error (0.05)

N = Total population for each district (doctors + ANMs + nurses)

Calculation:

n = (1.96 ^ 2 * 0.61 * (1-0.61) * 1946) / (0.05 ^ 2 * (1946-1) + 1.96 ^ 2 * 0.61 * (1-0.61))

n = 307.88

n ≈ 308

Doctors: (141 / 1946) * 308 ≈ 22 participants

ANMs: (1788 / 1946) * 308 ≈ 283 participants

Nurses: (17 / 1946) * 308 ≈ 3 participants

The total sample size of the study was 309, out of which the ANMs, Doctors and Nurses were 284, 22, and 3 respectively.

✓ Hypothesis

Null Hypothesis (H_0)– The prevalence of knowledge of ASB among healthcare providers is equal to 61%

Alternate Hypothesis (H_1) – The prevalence of knowledge of ASB among healthcare providers is greater than 61%.

✓ Research instrument -

In selected areas of Rajasthan, Jhpiego has conducted comprehensive training sessions targeting healthcare professionals, including ANMs, Nurses, and Doctors, focusing on the management of asymptomatic bacteriuria. Utilizing the training modules as a foundation, a specialized self-administered questionnaire has been

developed. Data will be collected using the CAPI tool, for which an ODK link is created which is provided here .

✓ **Ethical considerations-**

This research strictly adhered to ethical guidelines, and ensured informed consent through clear explanations of procedures. Participant anonymity and confidentiality of the information was maintained throughout the study. We minimize any discomfort or inconvenience and guarantee the right to withdraw at any point. Our commitment is to participant well-being and responsible research conduct.

✓ **Data Analysis Plan**- Data analysis using Microsoft Excel, SPSS version 22.

For the assessment of the Knowledge Questionnaire

- Knowledge questionnaire consists of a total of 15 questions.
- Each question contains options out of which one is correct.
- The healthcare provider is asked to encircle the correct option.
- For each correct answer, one mark will be awarded and for each incorrect answer, zero mark is awarded.

For the assessment of the Attitude Questionnaire

- The percentages for each question were calculated for positive and negative attitudes.

Results

Based on the inclusion and exclusion criteria, 309 participants were considered in the study. Table 2, displayss the demographic variables of health care professionals, while Table 3 shows the district-wise distribution of the health care professionals. The majority of the participants in the study were females. The age range of the participants is between 17-61 years with a median age of 37 years. Most of the participants were from the Karauli district, followed by Bikaner and Udaipur.

Demographics		Anm	Doctors	Nurses	Total
Total number of respondents		284	22	3	309
Refused/Training not done		34	6	5	44
Gender	Female	284	7	3	294
	Male	0	15	0	15
Median Age		37	37.5	40	37
Range		17-59	26-61	40-42	17-61

Table 2: Demographic characteristics of the study population

District	Anm	Doctors	Nurses	Total
Alwar	26	3	1	30
Bharatpur	26	1	0	27
Bikaner	53	3	0	56
Bundi	26	3	0	29
Churu	19	3	0	22
Dholpur	29	4	0	33
Karauli	57	5	2	63
Udaipur	47	1	0	48

Total	**283**	**22**	**3**	**308**

Table 3: District-wise distribution of healthcare professionals

Knowledge of Healthcare providers regarding ASB

The overall knowledge level of the research participants was 81%. It was noted that awareness regarding the diagnostic test used to confirm ASB was particularly low among healthcare providers, with only 24% demonstrating knowledge in this area. Specifically, only 22% of ANMs, 50% of doctors, and 33% of nurses were aware of the correct diagnostic test. It was also observed that only 58% of healthcare providers know about the potential complications of untreated ASB. The overall knowledge assessment of the research participants is shown in the following table 4.

Knowledge of Healthcare providers	**Knowledge %**			
	ANM	**Doctors**	**Nurses**	**Overall**
ASB is defined as the presence of bacteria in the urine without any symptoms of urinary tract infection?	88%	95%	100%	88%
Which population is at increased risk of ASB?	100%	100%	100%	100%
Which diagnostic test is used to confirm ASB?	22%	50%	33%	24%
ASB is always associated with symptoms such as fever and dysuria.	70%	55%	67%	68%
Which of the following conditions increases the risk of ASB?	70%	55%	33%	69%
ASB should be routinely treated with antibiotics in all asymptomatic patients.	94%	95%	100%	94%
Which of the following is a potential complication of untreated ASB?	56%	77%	67%	58%
What is the recommended management approach for pregnant women with ASB?	98%	91%	100%	98%
Which of the following statements about ASB is correct?	65%	68%	33%	65%

ASB screening is not necessary in asymptomatic individuals, even in high-risk populations.	96%	95%	100%	96%
Which antibiotic is commonly used for treating ASB?	90%	86%	67%	90%
What is the primary goal of ASB management?	77%	64%	100%	77%
A 28-year-old pregnant woman having asymptomatic bacteriuria needs an antibiotic	98%	95%	100%	97%
In pregnant women, bacteriuria screening is recommended in every antenatal care	99%	100%	100%	99%
The indicator of urinary dipstick screening is leucocyte and nitrite	96%	100%	67%	96%

Table 4: Knowledge regarding ASB among healthcare providers

The overall knowledge assessment was categorized into three subgroups: Knowledge of urinary tract infections, risk factors, and diagnostic tests; Knowledge of clinical management and risk factors; and Knowledge of healthcare and screening guidelines. The assessment was conducted based on the facility. The average mean of the participants' knowledge of the three subgroups was 70%, 82%, and 92% respectively. It was also found that the knowledge levels of healthcare providers were almost similar across both lower and higher facilities. (Table 5)

FACILITY	Knowledge % of Urinary Tract Infection Risk Factors and Diagnostic Tests	Knowledge % of Clinical Management and Risk Factors	Knowledge % of Healthcare and Screening Guidelines
HF	69%	82%	92%
LF	70%	82%	92%
Grand Total	70%	82%	92%

Table 5: Facility wise assessment of knowledge regarding ASB

The analysis of experience-based knowledge revealed varying levels of understanding across different categories. Healthcare providers with 1-5 years of experience demonstrated an average knowledge of 69% in urinary tract infection risk factors and diagnostic tests, 81% in clinical management and risk factors, and 90% in healthcare and screening guidelines. Those with 6-10 years of experience had slightly higher averages at 72%, 79%, and 91% respectively. Providers with 10-20 years of experience showed a notable increase in knowledge with averages of 71% for urinary tract infection risk factors and diagnostic tests, 84% for clinical management and risk factors, and 94% for healthcare and screening guidelines. Similarly, providers with over 20 years of experience had averages of 68%, 84%, and 94% in these categories. The overall averages across all experience levels were 70% for urinary tract infection risk factors and diagnostic tests, 82% for clinical management and risk factors, and 92% for healthcare and screening guidelines. This data indicates that knowledge levels tend to improve with experience, particularly in clinical management and healthcare guidelines.

EXPERIENCE	Average of Urinary Tract Infection Risk Factors and Diagnostic Tests	Average of Clinical Management and Risk Factors	Average of Healthcare and Screening Guidelines
1-5 years	69%	81%	90%
6-10 years	72%	79%	91%
10-20 years	71%	84%	94%
>20 years	68%	84%	94%
Grand Total	70%	82%	92%

Table 6: Experience-wise knowledge of healthcare providers regarding ASB

Attitude of Healthcare providers regarding ASB

Healthcare providers demonstrated a predominantly positive attitude towards ASB, with 90.4% expressing favorable views. A high percentage of providers demonstrated a positive attitude towards ASB screening in asymptomatic individuals (98.1%), recognizing its importance in preventing complications (94.5%) and advocating for it to be a routine part of healthcare practice (98.4%). Similarly, the majority supported the need for regular updates to ASB management guidelines (98.4%) and the implementation of education and training programs in healthcare settings (98.1%).

However, confidence in managing ASB cases effectively was notably lower, with only 67.6% of providers expressing confidence. This indicates a significant gap that could be addressed through targeted training and support. Additionally, while most providers were receptive to incorporating patient preferences into ASB management decisions (86.1%) and prioritizing ASB management in healthcare resource allocation (99.4%), only 79.9% had a positive perception of the role of antibiotics in ASB management, and 83.5% emphasized the importance of patient education. These findings suggest the need for continued education on antibiotic use and patient engagement strategies to ensure comprehensive ASB management.

Attitude of Healthcare Providers	Positive Attitude Percentage
Attitude towards ASB screening in asymptomatic individuals	98.1%
Importance of ASB management is in preventing complications	94.5%
ASB screening to be a routine part of healthcare practice	98.4%
Education and training programs on ASB management implementation in healthcare settings	98.1%
Confidence in managing ASB cases effectively	67.6%

ASB management guidelines should be updated regularly	98.4%
Reception to incorporate patient preferences into ASB management decisions?	86.1%
ASB management prioritized in healthcare resource allocation	99.4%
Perception on the role of antibiotics in ASB management	79.9%
Patient education is in ASB management	83.5%

Table 7: Assessment of positive attitude of healthcare providers regarding ASB

The attitude assessment of 309 participants highlighted both positive attitudes and areas for improvement regarding the management of asymptomatic bacteriuria (ASB) in pregnancy. A substantial 80.5% of respondents agreed or strongly agreed that they feel confident in managing ASB according to guidelines, while 19.4% expressed a lack of confidence. Furthermore, 89% recognized the importance of guideline recommendations in daily clinical practice, indicating strong support for adherence to standardized protocols.

Additionally, 87.4% agreed or strongly agreed that changes in urine color and smell should be evaluated through urine culture examination, yet 12.6% did not support this practice. There was also robust support (90.6%) for treating asymptomatic bacteriuria in pregnancy with antibiotics, although 9.4% disagreed or strongly disagreed. These findings underscore a generally positive attitude towards ASB management but also reveal gaps that could be addressed through enhanced education and training to boost confidence and consensus on best practices.

Attitude (N=309)	Strongly disagree. (Number, %)	Disagree (Number, %)	Agree (Number, %)	Strongly agree (Number, %)
I feel confident to manage ASB in pregnancy appropriate to guidelines.	7.4%	12%	49.8%	30.7%
Guideline recommendation is essential for daily clinical practice.	8.7%	2.3%	50.2%	38.8%
Changes in urine color and smell needs to be evaluated through urine culture examination.	6.5%	6.1%	46.9%	40.5%
Asymptomatic bacteriuria in pregnancy should be treated with antibiotics.	5.8%	3.6%	47.9%	42.7%

Table 8: Assessment of attitude regarding management of ASB

Discussion

Asymptomatic bacteriuria can lead to significant fetal and maternal complications if not diagnosed and treated. Therefore, regular screening for ASB and prompt treatment when it is detected are essential. (17)

A cross-sectional study based on community healthcare professionals to determine the knowledge and attitude regarding ASB in the districts of Rajasthan among 309 participants. The overall mean frequency of knowledge of the healthcare providers including doctors, ANMs, and nurses came out to be 81%. Unlike in the study by Myung Jin Lee et al. (18) where the mean frequency (± SD) of knowledge score was 37.3 % (±26.7 %), 44.0 % (±30.0 %) for those in medical departments, 29.8 % (±20.4 %) for those in surgical departments. In a study on Asymptomatic bacteriuria during

pregnancy – health professional's perspective it was observed that among the health professionals 96.6% were aware of asymptomatic bacteriuria. (17)
However, the knowledge about the diagnostic test was critically low (24%) as most of the healthcare providers are still practicing traditional method which is urine culture method rather than a multi-reagent sticks test which is more accurate and time friendly process of screening of ASB.

In our study, we found that 96% of healthcare professionals recognize that screening for asymptomatic bacteriuria (ASB) is unnecessary in asymptomatic individuals, even among high-risk populations. This aligns with the 2019 Clinical Practice Guideline for the Management of Asymptomatic Bacteriuria by the Infectious Diseases Society of America (IDSA). (19) According to these guidelines, ASB screening is generally not recommended for asymptomatic individuals, including those in high-risk categories. The current guidelines highlight that screening and treating ASB should be restricted to specific groups where the potential benefits outweigh the risks. This is crucial because unnecessary antimicrobial treatment can lead to adverse outcomes, such as antimicrobial resistance and Clostridioides difficile infections.
Knowledge of urinary tract infection, risk factors and diagnostic tests was lower as compared to the knowledge of clinical management and risk factors and in Healthcare and Screening Guidelines both in lower and higher facilities.

No significant differences were observed concerning the years of experience of doctors regarding screening and treatment for asymptomatic bacteriuria in pregnancy. This contrasts with a study conducted in Athens, which found that younger obstetricians were more likely to perform screening compared to their older counterparts. (20)

A significant majority endorsed the necessity for regular updates to ASB management guidelines (98.4%) and advocated for the implementation of education and training programs within healthcare settings (98.1%).

The study shows that the majority of healthcare providers exhibit a positive attitude towards ASB management, while only 67.6% of the healthcare providers overall, and 65.8% of the ANMs feel confident in effectively handling ASB cases. Also, 19.4% of the healthcare professionals show a negative attitude and disagree to confidently manage ASB in pregnancy appropriate to guidelines.

In our study, we set the null hypothesis (H_0) as the prevalence of knowledge of ASB among healthcare providers being equal to 61%. Conversely, our alternate hypothesis (H_1) posited that the prevalence of knowledge of ASB among healthcare providers is greater than 61%. The observed prevalence of knowledge in our study was 81%. Given this significant difference, we can reject the null hypothesis (H_0) and accept the alternate hypothesis (H_1), concluding that the prevalence of knowledge of ASB among healthcare providers is indeed greater than 61%.

Our study highlights that while a substantial majority of healthcare providers demonstrate awareness and a positive attitude towards the management of ASB, there are notable gaps in knowledge and confidence, particularly regarding diagnostic tests and adherence to guidelines. Moreover, our findings underscore the necessity for regular updates to ASB management guidelines and the implementation of comprehensive education and training programs to enhance the confidence and capability of healthcare professionals in managing ASB cases effectively.

Conclusion

Asymptomatic bacteriuria (ASB) is a common infection. In this study, healthcare professionals demonstrated a strong understanding and positive attitude towards managing ASB.

Doctors, nurses, and ANMs are well-informed about ASB and its potential consequences if left untreated. This knowledge is attributed to their participation in "Vatsalya" training and conferences regularly conducted by JHPIEGO, which keeps them updated on recent advancements. However, there is a need to enhance awareness of ASB among healthcare professionals across all districts in Rajasthan and eventually throughout all states in India.

While most healthcare providers have a favorable attitude towards managing ASB, only 67.6% overall, and 65.8% of ANMs, feel confident in their ability to effectively handle ASB cases. This underscores the necessity to improve skills and build confidence through targeted educational training, adequate staffing, and access to the necessary resources and supplies in public health facilities.

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ANNEXURE

Tool Used for data collection

Section 1: Demographics

1. **Q1 Profession?**
   - Doctor
   - Nurse
   - ANM
   - Other (specify)
2. **Have you been in any training conducted for ANC especially ASB?**
3. **Age: _____**
4. **Gender: Male / Female / Other ----------**
5. **Years of experience/practice in healthcare: _____**
6. **Healthcare facility/place of work: _____**
7. **Location (District): _____**
8. **No of ASB patients per month ----------**
9. **Type of Community Centre ----------**

Section 2: Knowledge Assessment

1. **ASB is defined as the presence of bacteria in the urine without any symptoms of urinary tract infection? (**Yes/No)

2. **Which population is at increased risk of ASB?**
   (a) Pregnant women
   (b) Young adults
   (c) Children

3. **Which diagnostic test is used to confirm ASB?**
   (a) Blood culture
   (b) Urine culture
   (c) Stool culture
   (d) Strip test

4. **ASB is always associated with symptoms such as fever and dysuria. (**True/False)

5. **Which of the following conditions increases the risk of ASB?**
   (a) Diabetes mellitus
   (b) Hypertension
   (c) Asthma

6. **ASB should be routinely treated with antibiotics in all asymptomatic patients. (**Yes/No)

7. **Which of the following is a potential complication of untreated ASB?**
   (a) Kidney stones
   (b) Sepsis
   (c) Gastritis sepsis

8. **What is the recommended management approach for pregnant women with ASB**?
   (a) No treatment
   (b) Antibiotic treatment
   (c) Surgery

9. **Which of the following statements about ASB is correct?**
    (a) It always progresses to symptomatic UTI
    (b) It rarely causes complications
    (c) It can lead to adverse pregnancy outcomes.

10. **ASB screening is not necessary in asymptomatic individuals, even in high-risk populations. (**True/False)

11. **Which antibiotic is commonly used for treating ASB**?
    (a) Penicillin
    (b) Ciprofloxacin
    (c) Paracetamol
    (d) Amoxycillin

12. **What is the primary goal of ASB management?**
    (a) Symptom relief
    (b) Bacterial eradication
    (c) Preventing complications.

13. **A 28-year-old pregnant woman having asymptomatic bacteriuria needs an antibiotic** (True/False)

14. **In pregnant women, bacteriuria screening is recommended in every antenatal care** (True/False)

15. **The indicator of urinary dipstick screening is leucocyte and nitrite** (True/False)

Section 3: Attitude Assessment

1. **Which of the following best describes your attitude towards ASB screening in asymptomatic individuals?**
    (a) Essential
    (b) Optional
    (c) Unnecessary

2. **How important do you think ASB management is in preventing complications?**
    (a) Very important
    (b) Somewhat important
    (c) Not important

3. **In your opinion, should ASB screening be a routine part of healthcare practice?**
    (a) Yes
    (b) No
    (c) Unsure

4. **Do you believe that education and training programs on ASB management should be implemented in healthcare settings?**
    (a) Yes
    (b) No
    (c) Maybe

5. **How confident are you to manage ASB cases effectively?**
    (a) Very confident
    (b) Somewhat confident
    (c) Not confident

6. **Do you think ASB management guidelines should be updated regularly?**

(a) Yes
(b) No
(c) Unsure

7. **How receptive are you to incorporating patient preferences into ASB management decisions?**
   (a) Very receptive
   (b) Somewhat receptive
   (c) Not receptive

8. **Should ASB management be prioritized in healthcare resource allocation?**
   (a) Yes
   (b) No
   (c) Unsure

9. **How do you perceive the role of antibiotics in ASB management?**
   (a) Essential
   (b) Sometimes necessary
   (c) Avoid whenever possible.

10. **Do you consider ASB screening as part of preventive healthcare?**
    (a) Yes
    (b) No
    (c) Unsure

11. **How important do you think patient education is in ASB management?**
    (a) Very important
    (b) Somewhat important
    (c) Not important

12. **I feel confident to manage ASB in pregnancy appropriate to guideline.**
    (a) Strongly disagree. (SD)
    (b) Disagree (D)
    (c) Agree (A)
    (d) Strongly agree. (SA)

13. **Guideline recommendation is applicable to my patients.**
    (a) Strongly disagree. (SD)
    (b) Disagree (D)
    (c) Agree (A)
    (d) Strongly agree. (SA)

14. **Guideline recommendation is essential for daily clinical practice.**
    (a) Strongly disagree. (SD)
    (b) Disagree (D)
    (c) Agree (A)
    (d) Strongly agree. (SA)

15. **Changes in urine color and smell needs to be evaluated through urine culture examination.**
    (a) Strongly disagree. (SD)
    (b) Disagree (D)
    (c) Agree (A)
    (d) Strongly agree. (SA)

16. **Asymptomatic bacteriuria in pregnancy should be treated with antibiotic.**

(a) Strongly disagree. (SD)
(b) Disagree (D)
(c) Agree (A)
(d) Strongly agree. (SA)

17. **Nowadays, I pay attention to the antibiotic resistance issue.**
    (a) Strongly disagree. (SD)
    (b) Disagree (D)
    (c) Agree (A)
    (d) Strongly agree. (SA)

Consent form

Study Title: Knowledge and Attitude regarding Asymptomatic Bacteriuria among Healthcare Providers in Rajasthan, India

Principal Investigator: Rohit Singh Dhingra, IIHMR Delhi

Introduction:
You are invited to participate in a research study to assess the knowledge and attitude of healthcare providers regarding asymptomatic bacteriuria in Rajasthan, India. Asymptomatic bacteriuria is a condition where bacteria are present in the urine without causing any symptoms. This study aims to understand healthcare providers' awareness and approach to this condition.

What is involved in the study?
If you agree to participate, you will be asked to complete a short, anonymous questionnaire. The questionnaire will take approximately 15 minutes to complete and will ask about your:

- Demographics (profession, years of experience)
- Knowledge of asymptomatic bacteriuria
- Attitudes towards diagnosis and treatment

Confidentiality:
All your information will be kept confidential. Your name and other identifying information will not be linked to your responses. The data will be stored securely and only used for research purposes.

Risks and Benefits:
There are no known risks associated with participating in this study. The potential benefit of this study is to improve the understanding of healthcare providers' knowledge and attitudes about asymptomatic bacteriuria. This information may be used to develop educational programs to improve patient care.

Voluntary Participation:

Your participation in this study is voluntary. You have the right to withdraw from the study at any time without penalty.

Questions and Concerns:
If you have any questions or concerns about the study, please do not hesitate to contact the Principal Investigator, [Name of Principal Investigator], at [Email Address] or [Phone Number].

Statement of Consent:
I have read and understood the information provided above. I have had the opportunity to ask questions and have received satisfactory answers. I voluntarily agree to participate in this study.

Participant:

- Name:
- Signature:
- Date:

Investigator:

- Name: Rohit Singh Dhingra
- Signature:
- Date:

Rohit D1

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