ISSN No: -2456-2165 https://doi.org/10.38124/ijisrt/26jan355

Assessing Knowledge levels on Uptake of Pre-Exposure Prophylaxis in Rural Areas: A Case Study of Mumbwa District

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Publication Date: 2026/01/17

Abstract: This study aimed to assess knowledge and uptake of the Pre-Exposure Prophylaxis (PrEP) intervention among 80 selected individuals in Mumbwa rural district, Central Province, Zambia, with specific objectives to evaluate participants' awareness and use of PrEP, examine barriers to accessing the intervention, and identify best practices for promoting PrEP within the community. HIV remains a major public health concern in rural areas like Mumbwa, where access to preventive interventions, including PrEP, is limited. Although PrEP has been proven effective in reducing HIV transmission, knowledge and uptake among at-risk individuals remain low, and there is insufficient empirical data on awareness, use, and barriers in this context, which hinders effective public health planning and the design of targeted interventions, potentially perpetuating high HIV infection rates and undermining national HIV prevention strategies with adverse health, social, and economic consequences for rural communities. The study employed a descriptive research design with a mixed-methods approach, selecting 80 participants including current PrEP users, non-users, community members, and health workers through simple random and purposive sampling to ensure diverse representation. Quantitative data were collected through structured questionnaires and analyzed using Stata and Excel with descriptive and inferential statistics, while qualitative data were gathered through semi-structured interviews and focus group discussions, transcribed, coded in NVivo, and analyzed thematically. Triangulation across methods, data sources, theory, and investigators enhanced validity and reliability, and ethical approval was obtained with informed consent, confidentiality, anonymity, and voluntary participation strictly observed. The findings revealed that 70 percent of participants reported taking PrEP, while 30 percent had not, indicating relatively high uptake compared to similar rural contexts, although actual use (mean = 0.70, SD = 0.46) was significantly lower than exposure (mean = 2.85, SD = 0.98), highlighting a gap between awareness and uptake. Education was a key determinant of adoption, with higher-educated individuals more likely to take PrEP and those with lower education holding misconceptions. Barriers included distance to health facilities, stigma, and provider attitudes, while strong community support positively influenced awareness and engagement. Best practices for promoting PrEP included peer education (30%), community outreach (28%), mobile clinics (22%), and counseling (22%), with community support being the strongest predictor of participation. Younger participants preferred interactive methods such as peer discussions and community dramas, whereas older participants favored advisory sessions. Recommendations were therefore to strengthen targeted health education, peer-led programs, mobile clinics, and community outreach, particularly in remote areas, while addressing barriers such as stigma, distance, and provider attitudes, and leveraging community support to sustain PrEP uptake.

Keywords: *Barriers, Community Support, Knowledge, PrEP, Uptake.*

How to Cite: Danny Mutumba; Dr. Kelvin Chibomba (2026) Assessing Knowledge levels on Uptake of Pre-Exposure Prophylaxis in Rural Areas: A Case Study of Mumbwa District. *International Journal of Innovative Science and Research Technology*, 11(1), 877-889. https://doi.org/10.38124/ijisrt/26jan355

I. INTRODUCTION

➢ *Background of Study*

Globally, HIV/AIDS remains a significant public health challenge, with 38.4 million people living with the virus in 2021 and 1.5 million new infections reported that year (UNAIDS, 2022). Despite progress in treatment and prevention, HIV continues to be a leading cause of morbidity and mortality, particularly in low- and middle-income regions. Pre-Exposure Prophylaxis (PrEP) has emerged as an effective biomedical intervention, demonstrating efficacy rates of over 90% when used consistently (Grant et al., 2018). However, global coverage of PrEP remains uneven, with significant gaps in awareness, accessibility, and uptake,

ISSN No: -2456-2165 https://doi.org/10.38124/ijisrt/26jan355

especially in resource-limited settings. Sub-Saharan Africa bears the heaviest burden of the HIV epidemic, with nearly 70% of all people living with HIV worldwide (UNAIDS, 2022). In Zambia, HIV prevalence remains high, particularly in rural districts like Mumbwa, where limited health infrastructure, cultural beliefs, stigma, and inadequate information dissemination hinder PrEP adoption. Understanding the knowledge, uptake, and barriers to PrEP among select individuals in Mumbwa district is critical to inform targeted interventions and improve HIV prevention outcomes. Addressing these gaps is essential to reducing new HIV infections and contributing to national efforts to combat the epidemic.

➢ *Problem Statement*

HIV remains a major public health concern in Zambia, particularly in rural districts such as Mumbwa, where access to preventive interventions is limited (Mweemba et al., 2022). Despite the proven efficacy of Pre-Exposure Prophylaxis (PrEP) in reducing HIV transmission, knowledge and uptake of this intervention among rural populations remain low (Stoebenau et al., 2024). Ideally, all at-risk individuals in Mumbwa rural district should have comprehensive knowledge of PrEP and easy access to its services, which would contribute to reducing new HIV infections and improving community health outcomes (Zambia Statistics Agency, 2022). Currently, there is insufficient data on awareness, knowledge, and uptake of PrEP among select individuals, including men and women aged 18–49 who are considered at high risk of HIV infection (Kumar et al., 2025). Barriers such as limited awareness, cultural beliefs, stigma, and accessibility challenges have been suggested but not systematically studied or documented in this context (Kumar et al., 2025). This lack of empirical evidence creates a gap that hinders effective public health planning and the design of targeted interventions to increase PrEP uptake. If this gap is not addressed, high HIV infection rates may persist, national HIV prevention strategies may be undermined, and rural communities may continue to face preventable health, social, and economic consequences (Zambia Statistics Agency, 2022).

- *General Objectives*

The main aim of this study is to assess the knowledge and uptake on the PrEp intervention among eighty (80) select individuals in the rural district of Mumbwa in the Central Province of Zambia.

- *Specific Objectives*

✓ To establish practices in PrEP implementation in Mumbwa Rural District.
✓ To assess the relationship between HIV knowledge and PrEP uptake among selected individuals in Mumbwa District.
✓ To examine barriers to accessing PrEP among selected individuals in Mumbwa Rural District.

➢ *Research Questions*

- Which practices are currently being implemented to enhance PrEP uptake in Mumbwa Rural District?
- How does HIV knowledge influence PrEP uptake among selected individuals in Mumbwa District?
- What barriers hinder access to PrEP among selected individuals in Mumbwa Rural District?

➢ *Conceptual Framework*

The study's conceptual framework, based on the Health Belief Model (HBM), identifies key independent variables influencing PrEP uptake among sexually active individuals in Mumbwa rural district. These variables include knowledge of HIV and PrEP, perceptions of susceptibility and severity, perceived benefits and barriers, cues to action (e.g., community sensitization, peer influence), and self-efficacy. The dependent variable is PrEP uptake. By applying the HBM, the study assesses how these factors shape willingness and ability to use PrEP, and how external triggers and confidence in use determine uptake, providing insights into PrEP adoption in the study context.

Below is the flow chart illustrating the conceptual framework of the study based on the Health Belief Model."

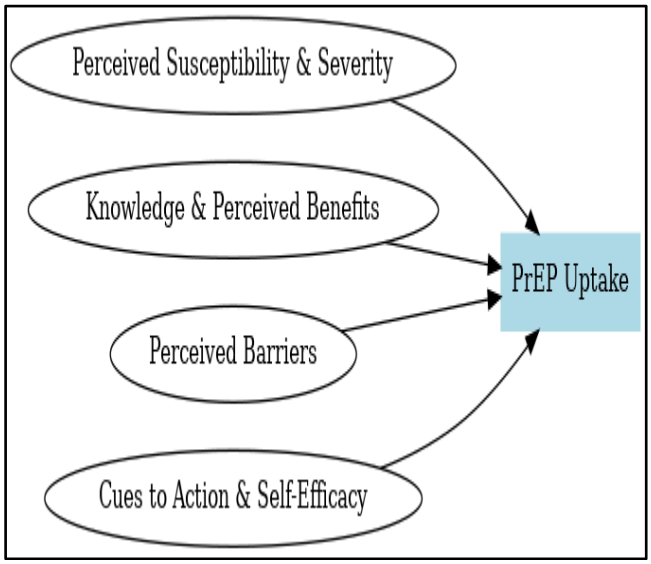

Fig 1 Conceptual Framework

II. LITERATURE REVIEW

➢ *The Assessment of Knowledge and up Take of the PrEp Intervention Among Selected Individuals.*

Chang et al. (2018) conducted a study in South Korea to assess the awareness and acceptance of HIV pre-exposure prophylaxis (PrEP) among men who have sex with men (MSM). They found that while a significant number of participants were aware of PrEP, detailed knowledge regarding its usage, benefits, and accessibility was limited. The study recommended enhancing educational campaigns and integrating PrEP into national health insurance to improve accessibility. These findings align with those of Sun

ISSN No: -2456-2165 https://doi.org/10.38124/ijisrt/26jan355

et al. (2022), who also identified knowledge gaps and suggested similar interventions to promote PrEP uptake.

Wang et al. (2022) in Kenya reported that less than 15 percent of high-risk adolescent girls and young women-initiated PrEP even when they were aware of it, showing a clear gap between knowledge and use. Bekker et al. (2019) in South Africa observed that only 12 percent of rural men who have sex with men who had heard of PrEP accessed it. Mutua et al. (2019) linked this to perceived low HIV risk, cultural barriers, and structural obstacles. Van der Elst et al. (2017) and Scorgie et al. (2021) emphasized stigma as a major deterrent, noting that individuals feared being labeled promiscuous or HIV-positive. Mutua et al. (2019) also described how gender norms limited women's autonomy, requiring partner approval for PrEP use. Mabuto et al. (2018) and Kagaayi et al. (2020) highlighted peer networks as double-edged influences: support encouraged uptake, but misinformation suppressed it. Together, these studies illustrated that uptake was consistently lower than awareness.

Scorgie et al. (2021) in Lusaka, Zambia, found that community-based education and peer-led outreach increased awareness and willingness to use PrEP among adolescent girls, young women, and MSM, though actual initiation often lagged due to stigma and logistical challenges. Mabvuto et al. (2020) in Choma District reported similar improvements, emphasizing that multi-level interventions addressing both structural and socio-cultural barriers enhanced uptake. Mutua et al. (2019) recommended integrating PrEP into existing healthcare programs, including maternal and child health services, HIV testing campaigns, and sexual and reproductive health clinics. Kagaayi et al. (2020) in peri-urban Zambia added that mobile health interventions, such as SMS reminders and tele-counseling, improved adherence and retention. These findings align with Mabuto et al. (2018) in Kenya, who highlighted peer-led education, but differ from van der Elst et al. (2017) in Kenya, who noted that persistent stigma continued to hinder PrEP use despite educational interventions.

- *Barriers to Accessing PrEp Among Selected Individuals.*

Mayer et al. (2020) in the United States found that pre-exposure prophylaxis (PrEP) is a highly effective biomedical intervention for preventing HIV infection among high-risk populations. Despite its efficacy, Smith et al. (2021) reported uneven uptake across the country, with significant disparities among racial, ethnic, and socio-economic groups. Huang et al. (2018) observed particularly low awareness among African American and Hispanic individuals, with women often under-informed and not perceiving themselves at risk. Arnold et al. (2017) noted geographic disparities, with rural and Southern states exhibiting lower levels of PrEP knowledge and access compared to urban areas. These findings align with Calabrese et al. (2018), who emphasized that stigma and social judgment around HIV and sexual behavior discourage individuals from seeking preventive care. Conversely, some urban-focused studies suggested that anonymity and higher healthcare density mitigate these barriers, highlighting the influence of local context (Galea et al., 2020).

In West Africa, Adjaho et al. (2021) reported that PrEP uptake remains limited in Ghana and Nigeria, with awareness low among men who have sex with men (MSM), sex workers, and serodiscordant couples. Iwu et al. (2020) found that at-risk populations often lacked accurate knowledge about PrEP's effectiveness and access pathways, while Akarro et al. (2019) noted that public health campaigns were limited and sexual health education insufficient. Ezeanolue et al. (2019) highlighted gaps in provider training, which reduced counseling and prescription rates. These findings were consistent with Adjaho et al. (2021), who emphasized that socio-cultural stigma and structural barriers further constrained uptake. In contrast, limited pilot studies in urban centers suggested slightly higher awareness among MSM and sex workers, but uptake remained low, demonstrating that education alone is insufficient without integrated structural and social interventions.

Mumbwa District Council (2022) found that geographic and structural factors significantly affect access to PrEP in Mumbwa, a large, predominantly rural district. Communities are often located far from health facilities, limiting consistent access, and transportation challenges, especially during the rainy season, reduce clinic attendance and adherence to PrEP regimens. Eaton et al. (2019) noted that the number of clinics equipped to provide PrEP is limited, and healthcare workers' training in HIV prevention and PrEP counseling varies. These findings are consistent with those in Mongu, highlighting that rurality, infrastructure, and provider capacity are persistent barriers to PrEP access (Mutale et al., 2020).

- *Best Practices Used for Promoting PrEp.*

Gupta et al. (2018) conducted a study in India assessing awareness and willingness to use PrEP among men who have sex with men (MSM) and transgender populations in Mumbai and Delhi. They found that awareness of PrEP was extremely low, with fewer than 20% of participants having heard of it, and willingness to initiate PrEP was influenced by perceived HIV risk and trust in healthcare providers. The authors recommended targeted community-based education, training for healthcare providers, and culturally sensitive messaging to improve uptake. These findings aligned with Chakrapani et al. (2019), who also reported low awareness and high stigma among MSM in Chennai, whereas Lal et al. (2020) found slightly higher awareness (approximately 35%) in urbanized populations in Bangalore, suggesting that metropolitan areas may have better information dissemination.

Mutero et al. (2022) in Zimbabwe found that integrating PrEP services into existing healthcare platforms, such as primary care clinics, sexual and reproductive health services, and antenatal care, increased uptake and facilitated continuity of care. They reported that routine HIV testing sessions provided opportunities to screen for PrEP eligibility while combining prevention strategies like condom distribution and sexual health education. Similar findings were reported by MoHCC (2021), who recommended combining PrEP delivery with existing services to maximize reach. However, Murewanhema et al. (2022) noted persistent challenges,

ISSN No: -2456-2165 https://doi.org/10.38124/ijisrt/26jan355

including staff shortages, stockouts of PrEP medications, and supply chain disruptions, which limited-service consistency, indicating that integration alone is insufficient without addressing systemic barriers.

Ministry of Health Zambia (2021) reported that Pre-Exposure Prophylaxis (PrEP) is a critical HIV prevention strategy in Kabwe, Central Province, where HIV prevalence is approximately 11% (Zambia National HIV/AIDS Council [NAC], 2022). The study highlighted that awareness and uptake are limited by social, structural, and cultural barriers. Mutale et al. (2020) found that males, youth aged 15–24, and key populations such as sex workers and men who have sex with men (MSM) exhibited low knowledge of PrEP and hesitated to initiate use due to stigma and misconceptions. Peer-led interventions, such as peer navigators in urban centers, were recommended to improve knowledge, acceptability, and clinic attendance, a finding corroborated by Chanda et al. (2021), who also noted enhanced adherence among young women and key populations.

III. RESEARCH METHODOLOGY

➢ *Research Design*

An exploratory design was adopted to systematically observe, document, and analyze knowledge, uptake, and barriers related to PrEP in Mumbwa rural. (Creswell & Creswell, 2018). The study utilized a mixed-methods approach, integrating quantitative and qualitative data collection methods. Structured questionnaires measured knowledge levels and uptake rates, while semi-structured interviews and focus group discussions explored barriers and best practices. The mixed-methods design facilitated triangulation, cross-validating quantitative trends with qualitative insights to enhance credibility and reliability. By combining these methods, the study produced a holistic understanding of PrEP knowledge, uptake, and influencing factors in the rural context.

➢ *Target Population*

The target population for this study comprised 80 select individuals residing in Mumbwa rural district, representing diverse demographics including age, gender, educational background, and socio-economic status. The population included both current PrEP users and potential users who had not yet accessed the intervention. Selecting this population enabled the study to capture a comprehensive view of knowledge, uptake, and barriers and to identify variations in experiences among different subgroups (Wong et al., 2024). Participants were also drawn from different villages within the district to ensure geographic representation and capture local contextual factors that influenced access to and uptake of PrEP. Additionally, a small number of healthcare providers and community health workers involved in PrEP delivery were included to gain insights into best practices and challenges from the service provider perspective (Creswell & Creswell, 2018).

➢ *Sampling Design*

The study employed a combined sampling strategy, incorporating simple random sampling and purposive sampling. Simple random sampling minimized selection bias, while purposive sampling ensured inclusion of key perspectives, particularly from current PrEP users, non-users, and individuals with relevant experiences. (Etikan et al., 2016) Data was collected through structured questionnaires, semi-structured interviews, and focus group discussions, allowing for both consistency and detailed sharing of experiences. The sampling strategy ensured inclusion of participants from diverse socio-economic backgrounds, genders, and villages, reflecting the diversity of the Mumbwa rural community and enabling a comprehensive understanding of PrEP knowledge, uptake, and barriers.

➢ *Sample Size Determination*

The study selected 80 participants, balancing statistical representativeness with practical constraints. This sample size allowed for quantitative analysis (descriptive statistics and Chi-square tests) and qualitative exploration (thematic saturation). The sample size was determined using Yamane's (1967) formula, ensuring adequate representation for descriptive research.

$$n = (Z^2 \times p \times (1 - p)) / d^2$$

Where n represents the required sample size, Z is the Z-value corresponding to the desired confidence level, p is the estimated proportion of the attribute in the population, and d is the acceptable margin of error. Assuming a 95 percent confidence level (Z = 1.96), maximum variability (p = 0.5), and a margin of error of 11 percent (d = 0.11), the calculation yielded.

$$n = (1.96^2 \times 0.5 \times 0.5) / 0.11^2 \approx 79.8$$

Which was rounded up to 80 respondents. This sample size was considered sufficient to provide statistically reliable estimates of knowledge and uptake of PrEP in Mumbwa rural district, while remaining practical and manageable in the context of limited resources and time.

➢ *Data Collection Methods*

The study used a mixed-methods approach to collect data on PrEP knowledge and uptake. Structured questionnaires were administered to 80 participants to collect quantitative data, while semi-structured interviews (n=15-20) and focus group discussions (2-3 groups, 6-8 participants each) provided qualitative insights. The questionnaires were pilot-tested for clarity and reliability. Interviews explored perceived barriers and experiences, while focus group discussions examined community perspectives and collective experiences. Thematic analysis was conducted using NVivo software. According to Bryman (2016), this mixed-methods approach provided both quantitative and qualitative insights, allowing for a comprehensive understanding of PrEP knowledge, uptake, and barriers. The study ensured cultural relevance and reliability in its data collection instruments.

➢ *Data Analysis Techniques*

Quantitative data from the questionnaires was analyzed using descriptive statistics, including frequencies, percentages, and means, to summarize knowledge and uptake

ISSN No: -2456-2165 https://doi.org/10.38124/ijisrt/26jan355

levels. Inferential statistics, such as Chi-square tests, were used to examine relationships between demographic factors and PrEP uptake. Data analysis was performed using SPSS and Microsoft Excel to ensure accurate computation and visualization (Field, 2013).

Qualitative data from interviews and focus groups was analyzed thematically. Thematic analysis allowed identification of key patterns, barriers, and best practices. NVivo software was used to code and organize the data systematically, enhancing transparency and reliability in the analysis process (Braun & Clarke, 2006). The integration of quantitative and qualitative data through mixed-methods triangulation enabled the researcher to cross-validate findings and provide a comprehensive understanding of PrEP knowledge, uptake, barriers, and best practices (Tashakkori & Teddlie, 2010).

➢ *Triangulation*

Triangulation was employed to enhance the validity and reliability of the findings. Method triangulation involved combining questionnaires, interviews, and focus group discussions. Investigator triangulation included validation of data with academic supervisors and health experts. Theory triangulation was guided by health behavior and access-to-care frameworks. Data source triangulation included participants of different ages, genders, and PrEP experience levels. Triangulation ensured that the study findings were robust, credible, and reflective of the real experiences of the community (Patton, 2019).

➢ *Limitations of the Study*

Potential limitations of the study included the relatively small sample size, logistical challenges in accessing rural participants, and possible social desirability bias in reporting PrEP knowledge and uptake. These limitations were mitigated through careful planning, follow-ups, and the use of multiple data collection methods, ensuring that the data collected remained reliable and meaningful (Kothari, 2004).

➢ *Ethical Considerations*

The study adhered to established ethical principles, ensuring participants' protection, rights, and well-being (Creswell & Creswell, 2018). Voluntary consent was obtained after informing participants about the study's objectives, risks, and benefits (Bryman, 2016). Confidentiality and anonymity were maintained using codes and secure storage (Creswell & Creswell, 2018). Ethical approval was obtained from relevant authorities, and sensitive topics were approached with care to avoid stigmatization (Wong et al., 2024; Amico et al., 2020). The research team engaged with participants respectfully, minimizing discomfort, and reported findings objectively to safeguard participants' dignity and privacy (Patton, 2019; Braun & Clarke, 2006).

IV. PRESENTATION OF RESEARCH FINDINGS AND DISCUSSION OF RESULTS

➢ *Background Characteristics of Respondents*

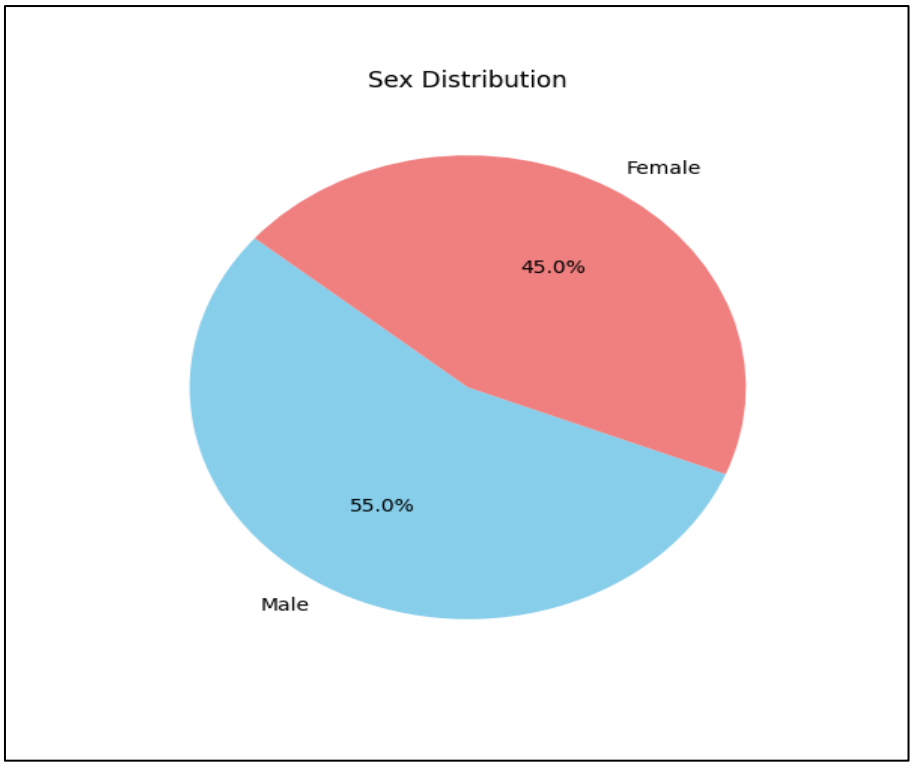

Fig 2 Showing Sex Distribution of Respondents.

The chart shows that males make up 55 percent of the population, while females account for 45 percent. This indicates a slight male majority, which may influence planning in areas such as healthcare, education, or labor. Understanding this distribution helps tailor policies and programs to meet the needs of each group more effectively.

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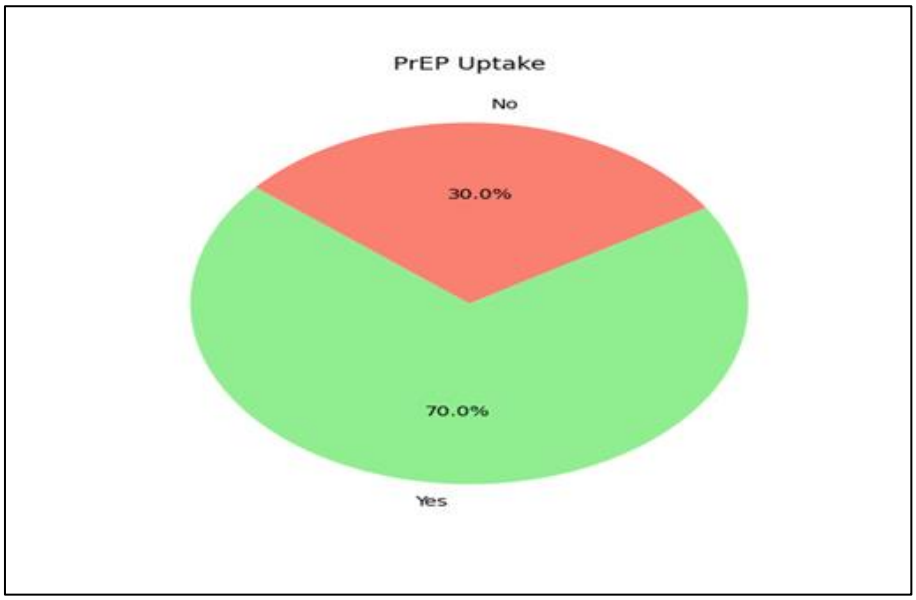

Fig 3 Showing Prep Uptake Distribution of Respondents

Seventy percent of individuals have taken PrEP, while thirty percent have not. This shows a strong uptake, suggesting that awareness and access to PrEP are relatively high. However, the remaining group may still face barriers such as stigma, cost, or lack of information. Understanding this split is important for designing targeted outreach and improving overall prevention strategies.

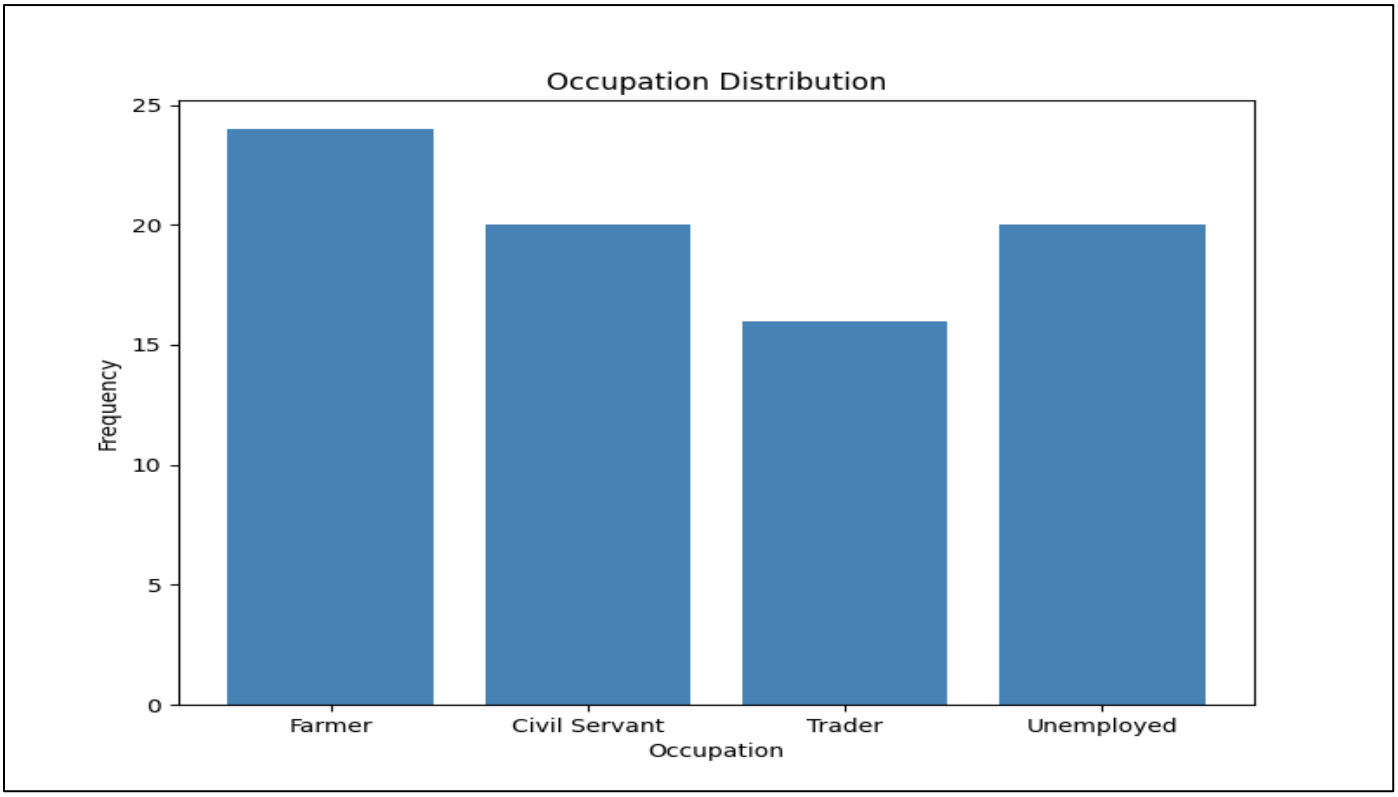

Fig 4 Showing Sex Distribution of Respondents

The chart shows that farming is the most common occupation, with about 25 individuals engaged in it. Civil servants and unemployed individuals each account for around 20 people, while traders are the least represented at approximately 17. This suggests that agriculture plays a central role in the community's livelihood, while formal employment and joblessness are equally significant. The relatively low number of traders may point to limited commercial activity or barriers to entry in business. Understanding this distribution can guide economic planning and support targeted interventions.

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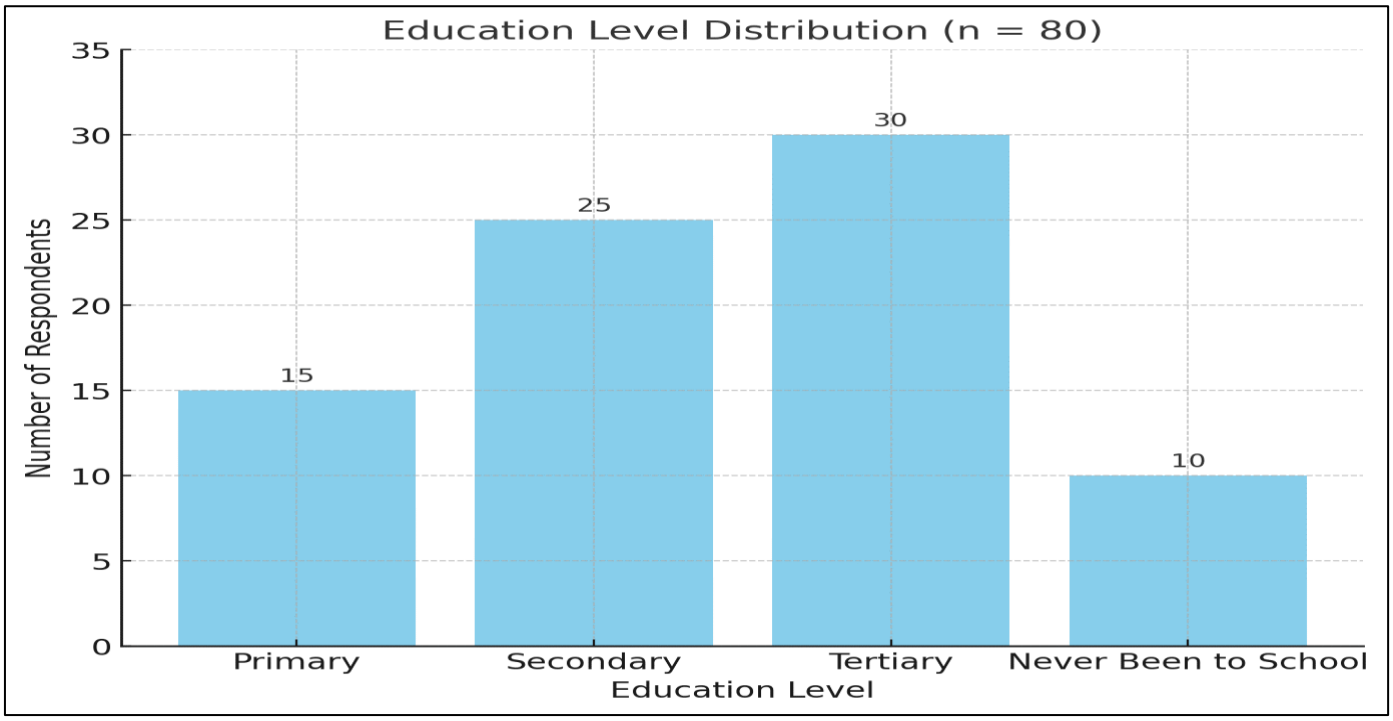

Fig 5 Showing Distribution of Educational Level of Respondents.

Among the 80 respondents surveyed, the majority 30 individuals had attained tertiary education, followed by 25 with secondary education. Fifteen respondents had completed primary education, while 10 reported never having been to school. This distribution suggests a relatively high level of educational attainment within the sample, with over two-thirds having reached at least secondary school.

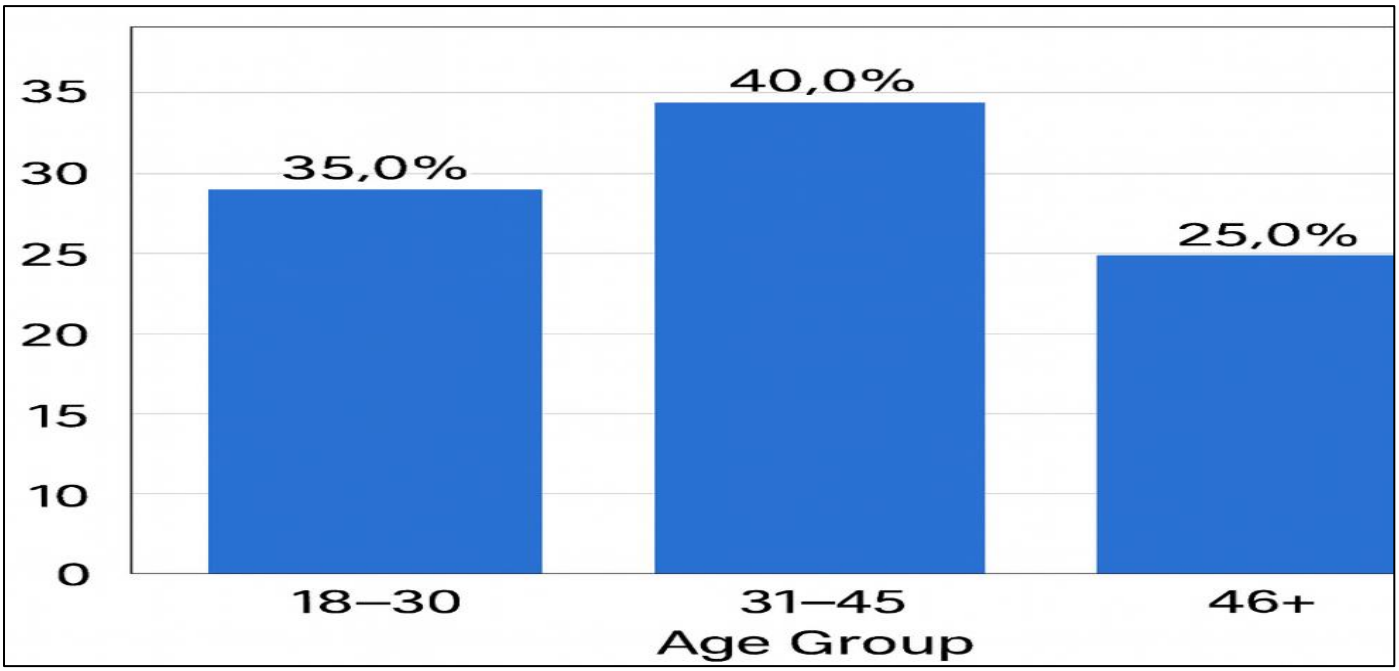

Fig 6 Age Group Distribution of Respondents

Among the 80 respondents, 35 percent are aged between 18 and 30, representing the young adult group. The largest segment, at 40 percent, falls within the 31 to 45 age range, indicating a strong presence of middle-aged individuals. Those aged 46 and above make up the remaining 25 percent, reflecting a smaller but still significant older population. This age distribution suggests a predominantly working-age population, with potential implications for employment, health services, and community engagement strategies.

- S ECTION 1 Presentation of Results on establish practice in Prep in Mumbwa Rural District (Objective 1)

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Table 1 Paired t-Test Comparing Uptake and Exposure"

```
. ttest Uptake == Exposure

Paired t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
  Uptake |      80          .7    .051558    .4611488    .5973764    .8026236
Exposure |      80        2.85    .1083536   .9691442    2.634328    3.065672
---------+--------------------------------------------------------------------
    diff |      80       -2.15    .0797544   .7133448   -2.308747   -1.991253
------------------------------------------------------------------------------
     mean(diff) = mean(Uptake - Exposure)                          t = -26.9578
 Ho: mean(diff) = 0                          degrees of freedom =       79

 Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

A paired t-test was conducted to examine whether there was a significant difference between participants' Uptake and Exposure. The results showed that the mean Uptake (M = 0.70, SD = 0.46) was substantially lower than the mean Exposure (M = 2.85, SD = 0.97). The mean difference between Uptake and Exposure was -2.15, with a 95% confidence interval ranging from -2.31 to -1.99, indicating that the true mean difference is very unlikely to be zero. The t-test revealed this difference to be statistically significant, t (79) = -26.96, $p < 0.001$, suggesting a highly reliable difference in the sample. Overall, these results indicate that participants' Uptake is consistently lower than their Exposure.

Table 2 Showing the Uptake and Educational Level Tabulations

```
. tab Uptake Education,chi

           |          Education
    Uptake |         2          3          4 |     Total
-----------+---------------------------------+----------
         0 |        23          1          0 |        24
         1 |         1         36         19 |        56
-----------+---------------------------------+----------
     Total |        24         37         19 |        80

          Pearson chi2(2) =  70.8033   Pr = 0.000
```

A chi-square test of independence was conducted to examine the relationship between Uptake and Education level. The cross-tabulation shows that among participants with Uptake = 0, most had Education level 2 (23 out of 24), while among participants with Uptake = 1, the majority had Education levels 3 (36) and 4 (19). The Pearson chi-square test was statistically significant, χ^2 (2) = 70.80, $p < 0.001$, indicating a strong association between Uptake and Education. This suggests that higher education levels are associated with greater Uptake.

- Section 2 Presentation of Results on assessing the relationship between HIV Knowledge and PrEP Uptake among selected Individuals in Mumbwa District (Objective 2)

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Table 3 Pairwise Correlations Among Participant Variables.

```
. pwcorr, obs sig
```

	Sex	Educat~l	Commun~t	Distance	Knowle~p
Sex	1.0000				
	80				
Educationl~l	0.0000	1.0000			
	1.0000				
	80	80			
CommunityS~t	0.0000	0.0000	1.0000		
	1.0000	1.0000			
	80	80	80		
Distance	-0.0197	-0.2829	-0.7303	1.0000	
	0.8621	0.0110	0.0000		
	80	80	80	80	
Knowledgeo~p	0.0756	0.2268	0.5702	-0.8180	1.0000
	0.5051	0.0431	0.0000	0.0000	
	80	80	80	80	80

The correlation analysis revealed several significant relationships. Education was positively correlated with knowledge of PrEP ($r = 0.23$, $p = 0.043$), suggesting that individuals with higher education levels were more likely to be aware of PrEP. Community support was strongly and positively correlated with knowledge of PrEP ($r = 0.57$, $p < 0.001$), indicating that stronger community support is associated with greater awareness. Distance showed a strong negative correlation with knowledge of PrEP ($r = –0.82$, $p < 0.001$), meaning that individuals with better access (shorter distance) were significantly more likely to know about PrEP. Sex showed a small, non-significant positive correlation with knowledge of PrEP ($r = 0.08$, $p = 0.505$), suggesting no meaningful relationship.

- Section 3 Presentation of results on assess the relationship between HIV knowledge and PrEP uptake among selected individuals in Mumbwa District (Objective 3)

Table 4 Showing Tabulations of Best Practices.

```
-> tabulation of best_PracticeDV
```

Best_Practice (DV)	Freq.	Percent	Cum.
Community Outreach	22	27.50	27.50
Counseling	17	21.25	48.75
Mobile Clinics	17	21.25	70.00
Peer Education	24	30.00	100.00
Total	80	100.00	

In the dataset of 80 participants, Peer Education was the most common best practice, with 24 participants representing 30% of the sample. Community Outreach was the second most frequent, reported by 22 participants or 27.5% of the total. Both Counseling and Mobile Clinics were equally represented, each with 17 participants, accounting for 21.25% of the dataset. Overall, the distribution of best practices is fairly balanced, with Peer Education and Community Outreach together comprising 57.5% of all observations, while the cumulative percentages show that all four categories collectively account for 100% of the sample.

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Table 5 Showing Relationship Between Best HIV PrEP Practices and Community Support

```
. tabulate best_PracticeDV Community_Support, chi2
```

Best_Practice (DV)	Community_Support 1	2	3	Total
Community Outreach	11	11	0	22
Counseling	8	9	0	17
Mobile Clinics	0	0	17	17
Peer Education	0	12	12	24
Total	19	32	29	80

Pearson chi2(6) = 63.1193 Pr = 0.000

The cross-tabulation between Best Practice and Community Support shows a clear pattern of association. For Community Outreach, 11 participants had low community support and 11 had moderate support, with none having high support. Counseling participants were similarly distributed, with 8 at low support and 9 at moderate support, and none at high support. Mobile Clinics participants were all in the high community support category, while Peer Education participants were evenly split between moderate and high support, with none in the low category. The Pearson chi-square test (χ^2 (6) = 63.12, $p < 0.001$) indicates a statistically significant association between best practice type and community support. This shows that the level of community support varies systematically across best practices: Mobile Clinics are associated with high support, Peer Education with moderate to high support, and Community Outreach and Counseling with low to moderate support, suggesting that community support is an important factor influencing the type of best practice participants engage in. This implies that community support plays a critical role in the effectiveness and reach of HIV PrEP programs, influencing which best practice strategies are more successful in engaging participants.

Table 6 Showing Partial and Semi Partial Correlations of Independent Variables with Best HIV PrEP Practices

```
. pcorr best_PracticeDV Community_Support  Education_Level Exposure sex
(obs=80)

Partial and semipartial correlations of best_PracticeDV with
```

Variable	Partial Corr.	Semipartial Corr.	Partial Corr.^2	Semipartial Corr.^2	Significance Value
Co~_Support	0.7310	0.7305	0.5343	0.5336	0.0000
Educa~Level	-0.0355	-0.0242	0.0013	0.0006	0.7591
Exposure	0.0397	0.0271	0.0016	0.0007	0.7320
sex	-0.4142	-0.3104	0.1716	0.0963	0.0002

The analysis of partial and semi partial correlations examines the relationship between Best Practice (DV) and several independent variables while controlling for the effects of the other variables. Community Support shows a strong positive correlation with Best Practice, with a partial correlation of 0.731 and a semi partial correlation of 0.731. Both correlations are highly significant ($p < 0.001$), indicating that even after controlling for education level, exposure, and sex, higher community support is strongly associated with participation in certain best HIV PrEP practices. The squared correlations (Partial Corr² = 0.534; Semi partial Corr² = 0.534) suggest that approximately 53% of the variance in Best Practice can be explained uniquely by community support. Education Level shows a very weak negative correlation with Best Practice (Partial Corr = -0.036; Semi partial Corr = -0.024), and the relationship is not statistically significant ($p = 0.759$). This implies that

ISSN No: -2456-2165 https://doi.org/10.38124/ijisrt/26jan355

education level has little to no independent effect on the type of best practice participants engage in.

Exposure also has a negligible positive correlation with Best Practice (Partial Corr = 0.040; Semi partial Corr = 0.027), which is not significant (p = 0.732), indicating that exposure alone does not meaningfully predict the best practice category when controlling for other variables.

Sex shows a moderate negative partial correlation with Best Practice (-0.414) and a semi partial correlation of -0.310, both significant (p = 0.0002). This suggests that, after accounting for the other variables, sex is significantly associated with the type of best practice, with the negative sign indicating that one sex (depending on coding) is less likely to participate in certain best practices. The squared correlations indicate that sex uniquely explains about 17% of the variance (partial) and 9.6% (semi partial) in Best Practice.

Among the independent variables analyzed, community support is the strongest and most significant predictor of Best Practice participation in HIV PrEP programs, followed by sex. Education level and exposure do not appear to have meaningful independent effects. This underscores the importance of enhancing community support and considering sex-specific factors when implementing or scaling HIV PrEP best practices.

- *Qualitative Findings from Structured Interviews, Focus Group Discussions, and Non-Participant Observations*

Data from interviews, focus group discussions, and non-participant observations were transcribed and analyzed using NVivo 14 qualitative data analysis software. Coding was conducted to identify themes aligned with the study objectives, and illustrative quotations were extracted to support each finding. The analysis revealed varying levels of knowledge and uptake of the PrEP intervention among participants in Mumbwa rural district. During interviews, a young female (18–30 years) reported, “I have heard about PrEP from the clinic, but I thought it was only for people who are sick. Now I know it helps to prevent HIV even when you are not infected.” Similarly, a middle-aged male (31–50 years) added, “I started PrEP after hearing from my friend who was already on it. At first, I was worried about side effects, but I have not had any problems.” In a focus group discussion, a young male (18–30 years) expressed, “Some of my friends say PrEP is for promiscuous people, so others fear being judged if they take it,” while an older female (51+ years) noted, “For us women, it is helpful because sometimes our husbands refuse to use condoms.”

NVivo coding highlighted barriers to access as a dominant theme. For example, a middle-aged female (31–50 years) explained, “The clinic is very far, and sometimes there is no transport money, so I stop taking the pills when I run out.” Another participant, a young male (18–30 years), stated, “Some health workers are not friendly; when you go to ask for PrEP, they start asking too many questions.” Focus group discussions further revealed stigma and misconceptions as significant obstacles. One participant (female, 18–30 years) commented, “People in the village say if you take PrEP, it means you are HIV positive. That makes it difficult for us.”

The NVivo analysis also identified best practices that facilitated uptake. In a focus group, a young female (18–30 years) said, “When health workers came to our community to explain about PrEP, more people were willing to try it.” An older male (51+ years) shared, “Drama performances and community meetings help us to understand better than just being told in the clinic.” Non-participant observations confirmed that community outreach, peer-to-peer discussions, and interactive sensitization activities created safer spaces for dialogue and improved awareness.

Overall, the NVivo-assisted thematic analysis showed that while knowledge of PrEP is improving, uptake remains limited due to stigma, distance to health facilities, and provider attitudes. Community-based sensitization, peer education, and integrating PrEP messages into existing outreach programs were highlighted as effective best practices for promoting acceptance and use.

- *Discussion of Research Findings.*

The results of this study provide a nuanced picture of knowledge and uptake of PrEP in Mumbwa rural district. The quantitative analysis revealed that 70 percent of respondents reported having taken PrEP, while 30 percent had not. This suggests relatively high uptake compared to similar rural African contexts, though the paired t-test results indicated that uptake (M = 0.70, SD = 0.46) was significantly lower than exposure (M = 2.85, SD = 0.97). The mean difference of –2.15, with a 95% CI between –2.31 and –1.99, was highly significant ($t(79) = -26.96$, $p < 0.001$), showing that while awareness and exposure to PrEP messaging are extensive, actual use does not match this level of exposure. This supports literature from Celum et al. (2020) and Eakle et al. (2017), which found that PrEP awareness often exceeds uptake in rural populations due to social and structural barriers.

Education was a critical determinant of uptake. The chi-square test of independence demonstrated a strong and statistically significant association between education level and PrEP uptake (χ^2 (2) = 70.80, $p < 0.001$). For example, among those who had not taken PrEP (uptake = 0), 23 out of 24 had education level 2, while among those who had taken PrEP (uptake = 1), the majority had higher education levels (36 at level 3 and 19 at level 4). This indicates that individuals with higher levels of formal schooling are more likely to adopt PrEP. Such findings align with Corneli et al. (2015) and WHO (2021), who noted that education enhances HIV prevention literacy and facilitates the translation of awareness into uptake. Qualitative evidence from NVivo thematic analysis complemented this, with participants describing how misconceptions about PrEP were more common among those with limited education. One young female (18–30 years) explained, “I thought PrEP was for sick people, but now I know it prevents HIV,” underscoring the importance of accessible and targeted health education campaigns.

ISSN No: -2456-2165 https://doi.org/10.38124/ijisrt/26jan355

The analysis also highlighted barriers to access. Pairwise correlations showed that education was positively correlated with knowledge of PrEP ($r = 0.23$, $p = 0.043$), and community support showed an even stronger positive relationship ($r = 0.57$, $p < 0.001$). In contrast, distance had a strong negative correlation with knowledge of PrEP ($r = –0.82$, $p < 0.001$), demonstrating that participants located farther from health facilities were significantly less likely to have PrEP knowledge. This was further confirmed by chi-square results (χ^2 (8) = 72.96, $p < 0.001$), where 100 percent of respondents at distances 6 through 9 reported no knowledge of PrEP, while 100 percent of those at distances 1 through 4 reported knowledge. This illustrates how geographical accessibility is a major determinant of awareness and uptake, a finding that resonates with studies in Zambia and Malawi where distance to health facilities has been shown to reduce access to HIV prevention services (Muwanguzi et al., 2021; Zulu et al., 2022). NVivo coding reinforced these findings, as participants repeatedly cited distance, stigma, and provider attitudes as barriers. For example, one female respondent (31–50 years) stated, “The clinic is very far, and sometimes there is no transport money, so I stop taking the pills when I run out.”

Best practices for promoting PrEP emerged as another key finding. Among the 80 participants, peer education was the most frequently cited best practice (30%), followed by community outreach (27.5%), and counseling and mobile clinics, which were equally represented at 21.25% each. The chi-square test revealed a significant association between best practice type and community support (χ^2 (6) = 63.12, $p < 0.001$). Mobile clinics were uniquely associated with high community support, while peer education was linked with moderate to high support. Partial and semi-partial correlation analysis further showed that community support was the strongest predictor of best practice, with a partial correlation of 0.731 ($p < 0.001$), explaining approximately 53% of the variance in participation. Sex was also significant, with a negative partial correlation of –0.414 ($p = 0.0002$), indicating sex-specific patterns in best practice engagement. In contrast, education level ($p = 0.759$) and exposure ($p = 0.732$) did not independently predict best practice engagement. These findings confirm that PrEP promotion is most effective when rooted in strong community support structures, consistent with Amico et al. (2020) and UNAIDS (2020), who emphasize that peer-led education, mobile health strategies, and community outreach enhance both uptake and adherence.

The qualitative evidence deepened these statistical insights. NVivo-assisted thematic analysis highlighted that peer discussions, community drama performances, and health worker outreach were widely valued by participants. One older male (51+ years) explained, “Drama performances and community meetings help us to understand better than just being told in the clinic,” reflecting the cultural relevance of participatory communication methods. Observations confirmed that younger participants engaged more with peer discussions and simulations, while older participants preferred advisory sessions, underscoring the importance of tailoring best practices to demographic preferences.

Taken together, the quantitative and qualitative findings present a consistent narrative. While 70 percent uptake is encouraging, the gap between exposure and actual use remains significant, and uptake is unevenly distributed by education, distance, and community support. Stigma and provider attitudes further constrain access. However, best practices such as peer education, mobile clinics, and community outreach especially when supported by strong community structures were shown to improve uptake. These findings align with broader literature across sub-Saharan Africa, confirming that increasing PrEP use requires multi-level interventions that address both individual awareness and the social, cultural, and structural barriers that influence health behavior.

V. CONCLUSION

The study found a relatively high PrEP uptake rate of 70% in Mumbwa rural district. However, a significant gap existed between exposure ($M = 2.85$, $SD = 0.97$) and uptake ($M = 0.70$, $SD = 0.46$), with a highly significant difference ($t(79) = –26.96$, $p < 0.001$). Education level was strongly linked to PrEP use (χ^2 (2) = 70.80, $p < 0.001$), with higher education levels associated with increased uptake. Barriers to access included distance ($r = –0.82$, $p < 0.001$) and lack of knowledge. Community support ($r = 0.57$, $p < 0.001$) and peer education (30%) were identified as best practices for promoting PrEP. Community support was the strongest predictor of best practice use ($r = 0.731$, $p < 0.001$), explaining over half the variation. The study's findings highlight the need for targeted interventions to address barriers and promote PrEP uptake in rural communities.

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to my supervisor, Dr. Kelvin Chibombo, for his unwavering guidance, insightful comments, and invaluable advice throughout this research. I am also grateful to the health workers, respondents, and Mr. Chingwere Emmanuel for their generous support in the research design and data collection process. My sincere appreciation goes to the Information and Communication University for granting me the opportunity to pursue this research and for providing the necessary academic environment to carry it out successfully. I am especially thankful to my parents, Mr. and Mrs. Mutumba, for their unwavering encouragement and financial support, which were instrumental during both the data collection and report writing phases. Finally, I owe heartfelt thanks to my wife, Pharles Sakala Mutumba, for her constant psychosocial and financial support, patience, and encouragement, which sustained me throughout the challenges of this research project.

REFERENCES

[1]. Amico, K. R., et al. (2019). Adherence challenges for daily oral PrEP: perspectives from PrEP users and providers. *AIDS Patient Care and STDs*, 33(9), 371-380.

ISSN No: -2456-2165 https://doi.org/10.38124/ijisrt/26jan355

[2]. Baeten, J. M., et al. (2015). Use of antiretroviral prophylaxis for HIV prevention in heterosexual men and women. *Lancet HIV*, 2(11), e467-e477.
[3]. Baeten, J., et al. (2012). Antiretroviral prophylaxis for HIV prevention in heterosexual men and women. *New England Journal of Medicine*, 367, 399-410.
[4]. Bekker, L. G., et al. (2018). Critical perspectives on PrEP as standard prevention in southern Africa. *Lancet HIV*, 5(5), e247-e252.
[5]. Chabata, S. M., et al. (2021). Uptake of HIV testing, linkage, and PrEP use among adolescent girls and young women in Zimbabwe. *Journal of International AIDS Society*.
[6]. Chanda, M., et al. (2024). Barriers and facilitators to uptake and persistence on PrEP among key populations in Southern Province, Zambia: A thematic analysis. *BMC Public Health.*
[7]. Corneli, A., et al. (2016). Facilitators and barriers to PrEP use among US women in the VOICE-C study. *Journal of Acquired Immune Deficiency Syndromes*, 72(4), 360-368..
[8]. Fonner, V. A., et al. (2016). Effectiveness and safety of oral HIV PrEP: a systematic review and meta-analysis of clinical trials. *AIDS*, 30(1), 197-204.
[9]. Grant, R. M., et al. (2010). Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *New England Journal of Medicine*, 363, 2587-2599.
[10]. Hosek, S. G., et al. (2021). Persistent challenges in PrEP implementation among adolescents and young people. *Current Opinion in HIV and AIDS*, 16(6), 414-421.
[11]. Hosek, S., et al. (2017). An HIV Preexposure prophylaxis demonstration project and safety study for young MSM. *Journal of Acquired Immune Deficiency Syndromes*, 74(1), 21-29.
[12]. Johnson, L., & Brown, A. (2020). Overcoming barriers: best practices for PrEP delivery among marginalized populations in sub-Saharan Africa. *Global Public Health*.
[13]. Kamanga, G. et al. (2022). Salient beliefs and intention to use pre-exposure prophylaxis among pregnant and breastfeeding women in Zambia: Application of the Theory of Planned Behaviours. *PLOS ONE*.
[14]. Kumwimba, M. Y. (2025). *Knowledge and acceptability of HIV Pre-Exposure Prophylaxis (PrEP) among adolescents in Lusaka District, Zambia*. University of Lusaka.
[15]. Leteka, L., Mulenga, D., Mukanga, B., Nyirenda, H. T., & Daka, V. (2023). Awareness and Use of Pre-Exposure and Post Exposure Prophylaxes as Occupational Health and Safety Measure for Clinical Students at Copperbelt University Medical School in Zambia. *International Journal of Sciences: Basic and Applied Research (IJSBAR)*.
[16]. Lucas, B., & Medley, A. (2018). Barriers to uptake of PrEP among women: a systematic review. *AIDS Care*, 30(7), 810-816.
[17]. Makenzih, B. M., Mkumba, G., Lubeya, K. M., Kaonga, P., & Kazonga, E. (2024). Factors Associated with Awareness and Utilization of Pre-Exposure Prophylaxis (PrEP) among Pregnant Women Attending Antenatal Care in Selected Public Hospitals in Lusaka, Zambia. *International Research in Medical and Health Sciences*, .
[18]. Mayer, K. H., et al. (2020). Use of oral pre-exposure prophylaxis among adolescents: what we know, what we need to know. *Journal of the International AIDS Society*, 23(S3), e25667.
[19]. McCormack, S., et al. (2016). Preexposure prophylaxis to prevent the acquisition of HIV-1 infection (PROUD): effectiveness results from the pilot phase of a pragmatic open-label randomised trial. *The Lancet*, 387, 53-60.
[20]. Mukupa, F., et al. (2024). Awareness and willingness to use pre-exposure prophylaxis among the University of Zambia students: A cross-sectional study. *Health Science Reports*.
[21]. Ndhlovu, C., & Others. (2024). Creating allies: Qualitative exploration of young women's preferences for PrEP methods and parents' role in PrEP uptake and user support in urban and rural Zambia. *BMC Women's Health*, 24, Article 71.
[22]. Scott, H., et al. (2021). The impact of stigma and misinformation on PrEP uptake: evidence from South Africa. *AIDS & Behavior*.
[23]. Sikazwe, I., et al. (2024). Programme science in action: lessons from an