

Knowledge and Attitude on Behavioral Skills to HIV Pre-Exposure Prophylaxis of Community Pharmacists in Region XI

Von Jay Maico G. Gabucan¹, Ferlien Mae B. Brieta¹

¹College of Pharmacy and Chemistry, University of the Immaculate Conception, Davao City 8000, Philippines

DOI: <https://doi.org/10.5281/zenodo.8103528>

Published Date: 11-March-2023, Amendment Date: 01-July-2023

Abstract: Community pharmacists may contribute to increasing HIV Pre-Exposure Prophylaxis (PrEP) uptake and adherence. However, no current policies highlight their roles in the country, and scarce literature has investigated it. The present study not only aims to fill the practical knowledge gap in literature but also to understand the current position of community pharmacists regarding their knowledge, attitude, and behavioral skills regarding HIV PrEP therapy and education. This study used a quantitative descriptive design to survey a random sample of community pharmacists in the Davao Region. Descriptive and inferential statistics identify the respondents' knowledge, attitude, and behavioral skills and how these variables are related. Community pharmacists in Davao Region showed average knowledge (mean score=58.98%), high levels of attitude (mean score=4.17) and behavioral skills (mean score=3.41). Attitude significantly predicted the level of behavioral skill ($p=.013$). At the same time, knowledge did not correlate significantly with behavioral skills ($p>.05$). To conclude, the current position of community pharmacists towards HIV PrEP therapy and education is favorable. They can extend their roles to provide referrals, counseling, and adherence-related services regarding HIV PrEP. Based on the findings, an action plan is proposed to establish future training on HIV PrEP or policy briefing for community pharmacists.

Keywords: Pharmacy, Public Health, HIV PrEP, attitude, knowledge, behavioral skills, Community Pharmacists, Philippines.

1. INTRODUCTION

As healthcare frontliners, community pharmacists are uniquely positioned in the healthcare landscape [1] as they are the closest professionals that patients seek in the community and can thereby increase HIV pre-exposure prophylaxis (PrEP) uptake, especially in high-risk populations [2]. However, it has been shown that there is a lack of demonstrated behavioral skills as affected by the knowledge and attitude of community pharmacists to HIV PrEP service [3]. As a result, community pharmacists fail to contribute significantly to such a health service, especially in patient counseling, uptake, and monitoring [4]. Because of this, HIV PrEP is still underutilized despite being proven safe and effective [3].

On a global picture, evidence shows that community pharmacists lack the behavioral skills needed to provide HIV PrEP care services. Only fifty-four percent of respondent pharmacists in Indiana had comfort or confidence in demonstrating behavioral skills to HIV PrEP counseling and uptake [5]. Okoro and Hillman (2018) also found that community pharmacists in Minnesota reported never receiving inquiries from PrEP clients and PrEP providers [6]. According to Unni and colleagues (2016), only twenty percent of respondent pharmacists in Mountain West State agreed they had the ability and confidence to demonstrate the behavioral skills necessary to provide HIV PrEP care [7]. Lastly, it has also been found that community pharmacists in Southeast Nigeria are only slightly involved in HIV PrEP care and, as a result, show little behavioral skills to provide HIV-related services [8].

The current practice and research landscape in the Philippines regarding community pharmacists' role in HIV PrEP uptake are scant. Pharmacists are involved in the HIV/AIDS core team of primary care facilities and HIV-dedicated establishments, but these are specialty fields. Additionally, HIV PrEP programs in the Philippines are limited. The government only has four identified HIV prevention programs [9]. From a legislative standpoint, the Philippines only has two laws that mandate the implementation of measures, controls, and programs for preventing and controlling HIV/AIDS in the Philippines. The Department of Health also released a department memorandum in 2021 elaborating on interim guidelines on Pre-Exposure Prophylaxis (PrEP) to prevent HIV infection in the Philippines. Region XI, the fifth with the highest HIV incidence in December 2021, only has three HIV treatment hubs and only one HIV primary care facility [10]. Community pharmacists' involvement in increasing awareness and uptake has been mentioned little to none in these programs.

From all the points mentioned above, a practical knowledge gap needs to be addressed. To the best of the researcher's ability, the behavioral skills of community pharmacists in Davao city to PrEP uptake due to their knowledge and attitude towards HIV PrEP has not been included in existing research. Hence, the aim of this research and at the end of this study is a call for action or program to address the findings. The researcher will also develop and endorse for validation to experts an action program to resolve or strengthen whatever this research concludes. Furthermore, results from this study will be disseminated to key stakeholders in HIV PrEP and pharmacy practice. This means that the authors will disclose the findings of this study to the community of pharmacists of the research locale as well as the HIV PrEP policymakers.

2. METHODS

The research design used in this study is a quantitative descriptive correlational research design involving the utilization of survey questionnaires. A quantitative research design usually involves the investigation of objective theories by employing deductive logic in considering the associations and relationships between variables [11]. This quantitative research design involves the utilization of survey questionnaires to describe the investigated variables. This specific research method allows researchers to establish a quantitative or numeric description of opinions, trends, and attitudes of a sample representative of a population group [11]. It is appropriate to utilize a quantitative, descriptive research design in this study because it will establish and describe the level of knowledge, attitude, and behavioral skills toward HIV PrEP from a given sample of community pharmacists. The researchers collected data using questionnaires and investigated the relationship between variables anchored from the information-motivation-behavioral skill model.

The research instrument used is a survey questionnaire utilizing the Google Forms platform (<https://docs.google.com/forms/>). This survey comprised four general parts - respondent demographics, respondent knowledge, respondent attitude, and respondent behavioral skills. The development of such questionnaires was based on previously conducted studies and has been further modified to fit the needs of this research. A Cronbach's alpha of ≥ 0.7 was considered the minimum standard in adapting these questionnaires. In assessing knowledge, the researcher used a seven-item multiple-choice questionnaire [12]. Additionally, the information these knowledge questions ask is also based on information provided by the US Centers for Disease Control and Prevention. The researchers removed the last item because it does not apply to the context of Philippine PrEP practice and culture. Respondent attitude and behavioral skills were assessed using a five-point Likert scale where one (1) was indicated as strongly disagree and five (5) as strongly agree. Questions for respondent attitude comprised five items [13], while questions for behavioral skills included nine [12].

Community pharmacists in the Davao Region were selected as respondents. This group are pharmacists, whether in public or private, that serve in the community through independent pharmacies or pharmacy chains. Permission letters were submitted to the offices of the local professional organization of the provinces in the Davao region. The researchers used Raosoft® sample size calculator [14] to obtain the sample size. Simple random sampling was used to select potential participants. Exclusion criteria include other fields of pharmacy practice such as manufacturing, academic, and hospital pharmacists, community pharmacists in public health and those working in the news and journalism industry, community pharmacists who used to work in pharmacies but are currently unemployed, and community pharmacists who own a pharmacy but is not performing pharmacy-related tasks.

The authors used descriptive statistics to summarize each variable. Inferential statistics were used to establish the association of knowledge and attitude to the behavioral skills of the community pharmacists. Pearson's r was used to identify the correlation between the independent and dependent variables. Linear regression was used to establish if the correlations were key predictors of the dependent variable variations. Lastly, ANOVA was used to show differences in behavioral skills of community pharmacists according to demographic profile.

3. RESULTS

Table 1 below shows the demographic characteristics of the respondents, which were community pharmacists in Region XI. The respondents were mostly female community pharmacists (80.4%). They were mostly aged twenty-one to thirty (79.4%). Most of the respondents were from Davao City (65.7%). Lastly, around forty-six percent of the respondents had community pharmacy experience for around one to five years.

Table 1. Demographic Profile of Community Pharmacist

| Demographic characteristics | % |
|-----------------------------|------|
| Sex | |
| Male | 19.6 |
| Female | 80.4 |
| Age | |
| 21-30 | 79.4 |
| 31-40 | 6.9 |
| 41 and above | 13.7 |
| Location | |
| Davao City | 65.7 |
| Davao Del Sur | 14.7 |
| Davao De Oro | 19.6 |
| Years of Service | |
| Less than 1 year | 13.7 |
| 1 to 5 years | 46.1 |
| 5 to 10 years | 20.6 |
| More than 10 years | 19.6 |

Table 2 shows the frequency and percentage of knowledge scores of the community pharmacists towards different aspects of HIV PrEP therapy and education. The average knowledge score was adequate (58.98%) with a standard deviation of 1.70. From Table 2, almost all (82.35%) of the community pharmacists correctly answered item. Table 2 also shows that less than half of the respondents incorrectly answered item 3.

Table 2. Level of Knowledge of Community Pharmacists Regarding HIV PrEP

| Question Number | Correct Answer | | Description | Interpretation |
|---|----------------|-------|-------------|---|
| | f | % | | |
| 1. According to current guidance, is HIV antibody testing suggested prior to initiating PrEP in a patient who is not experiencing any symptoms? | 84 | 82.35 | Very high | Excellent knowledge of community pharmacists towards HIV PrEP therapy and education is evident. |
| 2. How many antiretroviral medications are in the regimen that is FDA-approved for PrEP? | 55 | 53.92 | Adequate | Good knowledge of community pharmacists towards HIV PrEP therapy and education is evident. |

| | | | | |
|---|----|-----------------|----------|--|
| 3. Which antiretroviral medication(s) are FDA-approved for PrEP? | 48 | 47.06 | Adequate | Good knowledge of community pharmacists towards HIV PrEP therapy and education is evident. |
| 4. What is the FDA-approved dosing frequency for the antiretrovirals used for PrEP? | 53 | 51.96 | Adequate | Good knowledge of community pharmacists towards HIV PrEP therapy and education is evident. |
| 5. Which of the following is a relative contraindication to prescribing PrEP? | 62 | 60.78 | Adequate | Good knowledge of community pharmacists towards HIV PrEP therapy and education is evident. |
| 6. How often should individuals be tested for HIV while taking PrEP? | 59 | 57.84 | Adequate | Good knowledge of community pharmacists towards HIV PrEP therapy and education is evident. |
| Mean knowledge score in % (SD) | | 58.98 (1.70) | Adequate | Good knowledge of community pharmacists towards HIV PrEP therapy and education is evident. |

Note: f=frequency; SD=standard deviation

Table 3 shows the attitude of community pharmacists regarding HIV PrEP therapy and education. The total attitude mean was found to be 4.17 and the standard deviation was found to be 0.84. Table 3 also shows which statements had the highest and lowest mean score gathered from the community pharmacists. Statement one garnered the highest mean score amounting to 4.57 having a standard deviation of 0.93, Of all the statements, statement three from Table 3 had the lowest mean score compared to the rest. Despite that, the total mean score was found to be 3.77 ± 1.15 .

Table 3. Level of Attitude of Community Pharmacists Regarding HIV PrEP

| Statements | Mean | SD | Description | Interpretation |
|---|------|------|-------------|--|
| 1. I believe that PrEP is an important element of HIV prevention strategies. | 4.57 | 0.93 | Very high | Attitude of community pharmacists to HIV PrEP is always evident. |
| 2. I am convinced that PrEP is reliable in protecting oneself from HIV. | 4.37 | 0.92 | Very high | Attitude of community pharmacists to HIV PrEP is always evident. |
| 3. I am convinced that PrEP is a method to protect oneself from HIV with few side effects. | 3.93 | 1.01 | High | Attitude of community pharmacists to HIV PrEP is oftentimes evident. |
| 4. I think that PrEP is necessary compared to other alternatives to protect oneself from HIV. | 3.77 | 1.15 | High | Attitude of community pharmacists to HIV PrEP is oftentimes evident. |
| 5. I hope that PrEP will be paid for by statutory health insurance. | 4.20 | 1.15 | Very High | Attitude of community pharmacists to HIV PrEP is always evident. |
| Total Mean | 4.17 | 0.84 | High | Attitude of community pharmacists to HIV PrEP is oftentimes evident. |

Note: SD=standard deviation

Table 4 shows the level of behavioral skills of community pharmacists towards HIV PrEP therapy and education. The total mean was found to be 3.41 and the total standard deviation was found to be 0.72. Table 4 also shows the agreement of community pharmacists to the different statements expressing their behavioral skills towards HIV PrEP therapy and education. Statement 8 had the highest mean score, which was 3.88. The standard deviation for this statement was also found to be 0.87. Table 4 also shows that the lowest mean score was 3.11 from statement two with a standard deviation found to be 0.87.

Table 4. Level of Behavioral Skills of Community Pharmacists Regarding HIV PrEP

| Statements | Mean | SD | Description | Interpretation |
|---|------|------|-------------|--|
| 1. I am confident that I can determine whether a patient's sexual risk behaviors warrant the use of PrEP. | 3.24 | 0.96 | Moderate | Behavioral skill of community pharmacists to HIV PrEP is sometimes evident. |
| 2. I am confident that I can determine whether a patient's IV drug use behaviors warrant the use of PrEP. | 3.11 | 0.87 | Moderate | Behavioral skill of community pharmacists to HIV PrEP is sometimes evident. |
| 3. I can comprehensively discuss the efficacy of PrEP with a patient. | 3.25 | 1.00 | Moderate | Behavioral skill of community pharmacists to HIV PrEP is sometimes evident. |
| 4. I can comprehensively discuss whether PrEP is a good option for a patient. | 3.49 | 1.05 | High | Behavioral skill of community pharmacists to HIV PrEP is oftentimes evident. |
| 5. I can discuss the potential side effects of the antiretroviral medications used for PrEP with a patient. | 3.37 | 1.11 | Moderate | Behavioral skill of community pharmacists to HIV PrEP is sometimes evident. |
| 6. I can consistently determine whether a patient has a contraindication to using PrEP. | 3.20 | 0.95 | Moderate | Behavioral skill of community pharmacists to HIV PrEP is sometimes evident. |
| 7. I can refer PrEP to a patient for whom PrEP was appropriate and no contraindications were apparent. | 3.40 | 1.05 | High | Behavioral skill of community pharmacists to HIV PrEP is oftentimes evident. |
| 8. I am willing to follow up with patients on PrEP to monitor for side effects. | 3.88 | 0.87 | High | Behavioral skill of community pharmacists to HIV PrEP is oftentimes evident. |
| 9. I am comfortable following up with patients on PrEP to test them for HIV. | 3.75 | 0.93 | High | Behavioral skill of community pharmacists to HIV PrEP is oftentimes evident. |
| Total Mean | 3.41 | 0.72 | High | Behavioral skill of community pharmacists to HIV PrEP is oftentimes evident. |

Note: SD=standard deviation

Table 5 shows the significant relationship between the independent variables (knowledge and attitude towards HIV PrEP) to the dependent variable (behavioral skill towards HIV PrEP). No significant relationship was reported between the knowledge and behavioral skill of community pharmacists toward HIV PrEP therapy and education ($r=0.000$; $p=.998$). There was a significant relationship between the attitude and behavioral skills ($r=0.245$; $p<0.05$) of the community pharmacists towards HIV PrEP therapy and education. Attitude and behavioral skill are positively correlated, albeit with low correlation.

Table 5. Significance of the Relationship of Knowledge or Attitude to behavioral Skill

| | r | p-value | Decision |
|--|-------|---------|---|
| Knowledge and behavioral skills of community pharmacists | 0.000 | .998 | Not significant |
| Attitude and behavioral skills of community pharmacists | 0.245 | .013 | Significant (Low positive correlation) |

Note: r=Pearson correlation coefficient

Table 6 shows the influence of knowledge and attitude on the behavioral skill of community pharmacists towards HIV PrEP therapy and education. Knowledge is reported as not a predictor of behavioral skills. Attitude is reported as a predictor of behavioral skill with a standard coefficient beta of 0.247 ($p < .05$).

Table 6. Single or Combined Influence of Knowledge and Attitude

| Predictor | Standard Coefficient Beta | t | p-value | Remarks |
|-----------|---------------------------|-------|---------|-----------------|
| Knowledge | 0.017 | 0.175 | .862 | Not significant |
| Attitude | 0.247 | 2.525 | .013 | Significant |

Note: $R = .246$; $R \text{ Square} = 0.061$; $F = 3.188$; $P = 0.046$

Table 7 shows the level and significance of the community pharmacists' behavioral skills when segregated according to their demographics. Age, sex, and total years of service were reported not to affect the level of behavioral skill. Location, having a p-value of 0.002, significantly affected the behavioral skill of the respondents.

Table 7. Significance of Demographics to the behavioral Skill

| Profile | | Mean | t/F | p-value | Decision |
|------------------|------------------------|------|-------|---------|-----------------|
| Sex | Male | 3.50 | 0.772 | .442 | Not significant |
| | Female | 3.35 | | | Not significant |
| Age | 21-30 years old | 3.42 | 0.384 | .682 | Not significant |
| | 31-40 years old | 3.27 | | | |
| | 41 years old and above | 3.27 | | | |
| Location | Davao City | 3.28 | 6.482 | .002 | Significant |
| | Davao Del Sur | 4.00 | | | |
| | Davao De Oro | 3.25 | | | |
| Years of service | Less than 1 yr | 3.57 | 0.391 | .760 | Not significant |
| | 1 yr - 5 yrs | 3.38 | | | |
| | 5 yrs - 10 yrs | 3.33 | | | |
| | >10 yrs | 3.30 | | | |

4. DISCUSSIONS

Overall, the findings of this research were favorable. The level of knowledge of community pharmacists towards HIV PrEP therapy and education was adequate. This finding corroborates previous studies showing pharmacists had good knowledge of HIV and HIV PrEP therapy [8] [15]. Community pharmacists' attitudes and behavioral skills to HIV PrEP therapy and education are frequently evident, with minimal variation or dispersion from the mean between the respondents. This finding reinforces previous studies indicating highly positive attitudes among community pharmacists regarding HIV PrEP [8] and their health promotion role [16]. The results for the behavioral skills of community pharmacists align with previous studies showing that community pharmacists were comfortable in counseling [5] and assessing HIV risk [17]. Additionally, the willingness observed by the respondents of the current research aligns with that of Meyerson et al. (2009) [5].

However, a few findings need improvement or further research and investigation. Despite having adequate knowledge, some community pharmacists need improvement regarding the specific antiretroviral medication used for PrEP. This

finding is similar to that of literature where it has been shown that community pharmacists cannot identify the minimum number of HIV medications [18], nor can they able to identify specific medications for PrEP [7]. Additionally, some community pharmacists had reservations about the necessity of HIV PrEP compared to other alternatives. This reservation is also evident from the study of Shaer et al. (2013), which showed that their respondents either somewhat or strongly disagree with PrEP being more effective than condoms [19]. This finding contradicts a previous study by Przybyla et al. (2019), which reported that many respondents agree that PrEP is cost-effective and should be utilized by eligible patients [20]. Lastly, some community pharmacists were not confident assessing if a patient's IV use practices warrant HIV PrEP initiation. This finding is similar to previous studies where only a small percentage of the community pharmacists were confident that they could counsel [7], nor could they identify the appropriate candidate for PrEP initiatives [6]. The relationship between behavioral skills, attitude, and knowledge towards HIV PrEP therapy may explain this.

Inferential statistics revealed the relationship between knowledge and attitude on behavioral skills of community pharmacists towards HIV PrEP therapy and education. It has been shown that only attitude towards HIV PrEP therapy and education correlates and is a key predictor of behavioral skill of community pharmacists towards HIV PrEP. This means that the behavioral skills of community pharmacists towards HIV PrEP are not affected by whether or not they have adequate or insufficient knowledge. This contradicts the IMB model on which this study is theoretically grounded. However, some evidence highlights that knowledge or information and its direct path toward behavioral skills may be less evident, especially if the behavior is complex and requires the execution of multiple skills [21]. This is congruent with previous studies that reported awareness and confidence are more important variables in predicting dispensing practices or skills [5]. The concept of knowledge differs from awareness in that knowledge is information obtained from authoritative sources and thus regarded as factual. In contrast, awareness is more nuanced, where subjectivity is much more evident [22]. But because most pharmacists believe that providing pharmaceutical care is a primary responsibility and is valuable in improving patients' quality of life [23], they can easily enhance their knowledge using the internet, where it is readily available for pharmacists [24] if the need arises.

5. CONCLUSIONS

The community pharmacists in Region XI were found to have adequate knowledge and high levels of attitude and behavioral skills towards HIV PrEP therapy and education. These healthcare professionals provide great potential to contribute to HIV management and prevention, especially in HIV PrEP uptake and utilization. Despite that, further improvements can be made by regulatory bodies like the Philippine Pharmacists Association, the Professional Regulatory Commission, the Department of Health, and the Commission of Higher Education, to target key specific areas in their knowledge, attitude, and behavioral skills. Since an action plan has been proposed, experts should validate it for feasibility and acceptability of the planned events or activities.

6. ETHICS APPROVAL STATEMENT

This study was granted ethics approval by the University of the Immaculate Conception - Research Ethics Committee on October 24, 2022, with protocol number 24-GS-09-22.

REFERENCES

- [1] J. E. Myers, D. Farhat, A. Guzman and V. Arya, "Pharmacists in HIV Prevention: An Untapped Potential," *Am J Public Health*, vol. 109, no. 6, June 2019.
- [2] A. Zhao, D. T. Dangerfield, II, A. Nunn, R. Patel, J. E. Farley, C. C. Ugoji and L. T. Dean, "Pharmacy-Based Interventions to Increase Use of HIV Pre-exposure Prophylaxis in the United States: A Scoping Review," *AIDS and Behavior*, pp. 1-16, 20 October 2021.
- [3] K. J. Wilby and A. J. Smith, "A Narrative Review of Continuing Professional Development Needs for Pharmacists with Respect to Pre-exposure Prophylaxis (PrEP) for Human Immunodeficiency Virus (HIV)," *Pharmacy*, vol. 8, no. 84, 2020.
- [4] I. Zablotska, A. E. Grulich, N. Phanuphak, T. Anand, S. Janyam, M. Poonkasetwattana, R. Baggaley, F. van Griensven and Y.-R. Lo, "PrEP implementation in the Asia-Pacific region: opportunities, implementation and barriers," *Journal of International AIDS society*, vol. 19, no. Suppl 6, 2016.
- [5] B. E. Meyerson, P. C. Dinh, Jr, J. D. Agley, B. J. Hill, D. N. Motley, G. A. Carter, W. Jayawardene and P. T. Ryder, "Predicting Pharmacist Dispensing Practices and Comfort Related to Pre-exposure Prophylaxis for HIV Prevention (PrEP)," *AIDS and Behaviour*, vol. 23, no. 7, pp. 1925-1938, July 2019.

- [6] O. Okoro and L. Hillman, "HIV pre-exposure prophylaxis: Exploring the potential for expanding the role of pharmacists in public health," *Journal of the American Pharmacists Association*, vol. 58, pp. 412-420, 2018.
- [7] E. J. Unni, N. Lian and W. Kuykendall, "Understanding community pharmacist perceptions and knowledge about HIV preexposure prophylaxis (PrEP) therapy in a Mountain West state," *Journal of the American Pharmacists Association*, vol. 56, pp. 527-532, 14 May 2016.
- [8] N. Ajagu, M. U. Anetoh and S. O. Nduka, "Expanding HIV/AIDS care service sites: a cross sectional survey of community pharmacists' views in South-East, Nigeria," *Journal of Pharmaceutical Policy and Practice*, vol. 10, no. 34, 2017.
- [9] A. Restar, M. Nguyen, K. Nguyen, A. Adia, J. Nazareno, E. Yoshioka, L. Hernandez and D. Operario, "Trends and emerging directions in HIV risk and prevention research in the Philippines: A systematic review of the literature," *PLoS One*, vol. 13, no. 12, 5 December 2018.
- [10] Department of Health, HIV/AIDS & ART REGISTRY OF THE PHILIPPINES, Department of Health, 2022.
- [11] J. W. Creswell, *Research design*, 3 ed., SAGE Publications, 2009.
- [12] J. L. Walsh and A. E. Petroll, "Factors Related to Pre-exposure Prophylaxis Prescription by U.S. Primary Care Physicians," *Am J Prev Med*, vol. 52, no. 6, June 2017.
- [13] F. Kutscha, M. Gaskins, M. Sammons, A. Nast and R. N. Werner, "HIV Pre-Exposure Prophylaxis (PrEP) Counseling in Germany: Knowledge, Attitudes and Practice in Non-governmental and in Public HIV and STI Testing and Counseling Centers," *Frontiers in Public Health*, vol. 8, p. 298, July 2020.
- [14] Raosoft, Inc., "Sample size calculator," 2004. [Online]. Available: <http://www.raosoft.com/samplesize.html>.
- [15] E. I. Sianturi, E. Latifah, M. Pane, D. A. Perwitasari, Satibi, S. A. Kristina, E. B. Hastuti, J. Pavlovich and K. Taxis, "Knowledge, empathy, and willingness to counsel patients with HIV among Indonesian pharmacists: a national survey of stigma," *AIDS Care*, vol. 34, no. 1, pp. 21-28, 2022.
- [16] L. Watson, C. Bond and C. Gault, "A survey of community pharmacists on prevention of HIV and hepatitis B and C: current practice and attitudes in Grampian," *Journal of Public Health Medicine*, vol. 25, no. 1, pp. 13-18, 2003.
- [17] J. M. Broekhuis, K. K. Scarsi, H. R. Sayles, D. G. Klepser, J. P. Havens, S. Swindells and S. H. Bares, "Midwest pharmacists' familiarity, experience, and willingness to provide pre-exposure prophylaxis (PrEP) for HIV," *PLoS One*, vol. 13, no. 11, 14 November 2018.
- [18] L. J. Pineda, M. Iandiorio, S. Rankin and B. Jakeman, "Evaluating community pharmacists' HIV testing knowledge: A cross-sectional survey," *Journal of the American Pharmacist Association*, vol. 55, no. 4, 2015.
- [19] K. M. Shaeer, E. M. Sherman, S. Shafiq and P. Hardigan, "Exploratory survey of Florida pharmacists' experience, knowledge, and perception of HIV pre-exposure prophylaxis," *Journal of the American Pharmacist Association*, vol. 54, no. 6, pp. 610-617, 30 May 2014.
- [20] S. M. Przybyla, K. Parks, J. Bleasdale, J. Sawyer and D. Morse, "Awareness, knowledge, and attitudes towards human immunodeficiency virus (HIV) pre-exposure prophylaxis (PrEP) among pharmacy students," *Curr Pharm Teach Learn*, vol. 11, no. 4, pp. 352-360, April 2019.
- [21] C. Bian, S. Xu, H. Wang, N. Li, J. Wu, Y. Zhao, P. Li and H. Lu, "A Study on the Application of the Information-Motivation-Behavioral Skills (IMB) Model on Rational Drug Use Behavior among Second-Level Hospital Outpatients in Anhui, China," *PLoS One*, vol. 10, no. 8, 14 August 2015.
- [22] R. Trevethan, "Deconstructing and Assessing Knowledge and Awareness in Public Health Research," *Frontiers in Public Health*, vol. 5, 7 August 2017.
- [23] A. Siddique, E. Ahmed, M. Al Zoghabi, E. Alsaif and F. Alhawshani, "Exploring Community Pharmacist's Knowledge, Attitude, and Practice toward the Provision of Pharmaceutical Care. A Prospective Cross-sectional Study from Saudi Arabia," *Journal of Pharmacy and Bioallied Sciences*, vol. 14, no. 1, pp. 13-18, Jan-Mar 2022.
- [24] K. MacLure and D. Stewart, "Digital literacy knowledge and needs of pharmacy staff: A systematic review," *Journal of Innovation in Health Informatics*, vol. 23, no. 3, pp. 560-571, October 2016.