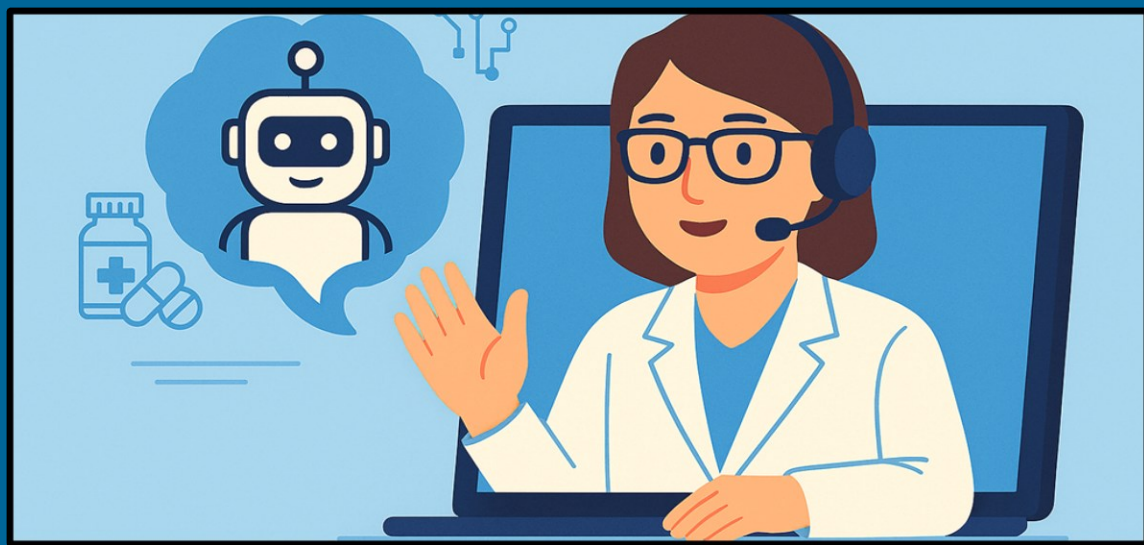




Telepharmacy Perceptions of Artificial Intelligence in Clinical Practice: A Cross-Sectional Survey

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BACKGROUND

- Artificial intelligence (AI) is increasingly integrated into healthcare supporting applications such as clinical decision support (CDS), medication safety and workflow automation
- In pharmacy practice, AI has the potential to enhance medication optimization, improve efficiency and strengthen decision-making.
- Successful AI integration in pharmacy practice depends on providers' perceptions, acceptance and readiness to adopt AI
- This study examined Canadian telepharmacy providers' attitudes, willingness and perceived barriers to AI integration into pharmacy practice

METHODS

DESIGN: Cross-sectional observational study

TOOLS

- Electronic questionnaire using Microsoft Forms, link distributed via email by company leadership
- Survey questions adapted from Shabana et al. 2025 and OntarioMD survey "The Role of AI in Community Healthcare (2026)"

PARTICIPANTS

- All those employed by Northwest Telepharmacy Solutions scheduled to work during the two-week study period in March 2026

DATA COLLECTED

- Participant sociodemographic characteristics
- Attitudes toward and willingness to adopt AI in pharmacy practice (5-point Likert scale)
- Perceived barriers to AI implementation and adoption (agree/disagree)
- AI literacy topics of interest
- Self-reported confidence in AI use
- Use of and trust in AI applications
- Impact of AI on clinical decision-making
- Preferred learning methods for AI training
- Recent AI technologies used in professional in professional practice

ANALYSIS

Descriptive and inferential statistics, summarized as frequencies, percentages, and medians with interquartile ranges. Associations between variables were explored to assess factors influencing attitudes and willingness to adopt AI, statistical significance set at $p < 0.05$

RESULTS

Table 1: Sociodemographic Factors

Variable	N (%)	Variable	N (%)
Age in Years		Knowledge About AI Before Survey	
25 to 34	9 (11.2)	Yes	80 (100.0)
35 to 44	25 (31.2)	No	0 (0.0)
45 to 54	31 (38.8)	Knowledge of AI in Pharmacy Practice	
55 or greater	15 (18.8)	1 (lowest)	10 (12.5)
Current Gender Identity		2	19 (23.8)
Male	24 (30.0)	3	33 (41.2)
Female	55 (68.8)	4	17 (21.2)
Prefer not to say	1 (1.2)	5 (highest)	1 (1.2)
Highest Education Level		Understanding of AI Advantages	
CCAPP accredited diploma for Pharmacy technician	2 (2.5)	1 (lowest)	3 (3.8)
Bachelor's in Pharmacy	25 (31.2)	2	12 (15.0)
Bachelor Degree (other than pharmacy)	2 (2.5)	3	33 (41.2)
Pharm D	21 (26.2)	4	25 (31.2)
Master's	11 (13.8)	5 (highest)	7 (8.8)
ACPR	12 (15.0)	Understanding of AI Disadvantages	
Other	7 (8.8)	1 (lowest)	3 (3.8)
		2	11 (13.8)
		3	37 (46.2)
		4	18 (22.5)
		5 (highest)	11 (13.8)

Table 3: Willingness to Apply AI in Pharmacy Practice

Item	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
1. Connecting healthcare provider systems together	0 (0.0)	4 (5.0)	12 (15.0)	41 (51.2)	23 (28.7)
2. Evaluating different treatment options	1 (1.2)	6 (7.5)	17 (21.2)	40 (50.0)	16 (20.0)
3. Medical/social data collection	2 (2.5)	8 (10.0)	17 (21.2)	40 (50.0)	13 (16.2)
4. Improving patient adherence	0 (0.0)	6 (7.5)	22 (27.5)	35 (43.8)	17 (21.2)
5. Identifying/resolving medication errors	1 (1.2)	6 (7.5)	23 (28.7)	39 (48.8)	11 (13.8)
6. Detecting hidden and undiagnosed diseases	0 (0.0)	6 (7.5)	25 (31.2)	37 (46.2)	12 (15.0)
7. Guide decision-making process in medical treatment	2 (2.5)	8 (10.0)	22 (27.5)	36 (45.0)	12 (15.0)
8. Identifying/resolving adverse drug reactions	1 (1.2)	10 (12.5)	22 (27.5)	36 (45.0)	11 (13.8)
9. Identifying/resolving drug-related problems	1 (1.2)	7 (8.8)	28 (35.0)	31 (38.8)	13 (16.2)
10. Medication dispensing	1 (1.2)	12 (15.0)	24 (30.0)	30 (37.5)	13 (16.2)
11. Follow up and monitor patients	0 (0.0)	12 (15.0)	27 (33.8)	28 (35.0)	13 (16.2)
12. Specifying treatment outcome	1 (1.2)	8 (10.0)	32 (40.0)	34 (42.5)	5 (6.2)
13. Patient counseling	9 (11.2)	24 (30.0)	22 (27.5)	16 (20.0)	9 (11.2)

*Median Total Score
range 13 (low) to 65 (high)

46.5 IQR 43-52

*Each question scored, range:
1 low- strongly disagree to
5 high-strongly agree

Survey Response Rate
47% (80/170)

Table 2: Barriers to AI implementation and adoption

Item	Disagree n (%)	Agree n (%)
1. AI requires human supervision	6 (7.6)	73 (92.4)
2. Regulatory and social limitations may create challenges that restrict how effectively AI can support medical practitioners	7 (8.9)	72 (91.1)
3. The challenge of empathizing and considering the patient's emotional well-being	9 (11.4)	70 (88.6)
4. Concerns about legal action	11 (13.9)	68 (86.1)
5. If a vital decision (such as end-of-life care) must be taken, the AI cannot make the decision and will generate an unreliable report	16 (20.3)	63 (79.7)
6. Lack of AI information	17 (21.5)	62 (78.5)
7. Lack of AI training	19 (24.1)	60 (75.9)
8. Translating medical terminology into machine language involves collaboration between healthcare practitioners and AI	21 (26.6)	58 (73.4)
9. Lack of AI flexibility	22 (27.8)	57 (72.2)
10. Lack of AI-related software and hardware	22 (27.8)	57 (72.2)
11. High running cost of AI	24 (30.4)	55 (69.6)
12. Difficulty to apply AI	31 (39.2)	48 (60.8)
13. Lack of time	45 (57.0)	34 (43.0)

Table 4: Attitudes towards Implementation of AI in Practice

Item	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
1. I like to receive training in AI because it's important to improve my career as a pharmacist	0 (0.0)	3 (3.8)	14 (17.5)	38 (47.5)	25 (31.2)
2. I like to be up to date with AI applications in pharmacy settings	0 (0.0)	2 (2.5)	18 (22.5)	39 (48.8)	21 (26.2)
3. I believe that AI will improve the services provided in the pharmacy practice	2 (2.5)	2 (2.5)	16 (20.0)	39 (48.8)	21 (26.2)
4. I feel that AI will enhance the process of decision-making in medical treatment*	1 (1.2)	7 (8.8)	13 (16.2)	48 (60.0)	10 (12.5)
5. I feel that AI can enhance the pharmacist's role in patient follow-up and monitoring	0 (0.0)	4 (5.0)	19 (23.8)	43 (53.8)	14 (17.5)
6. I believe that AI can help reduce medication errors	0 (0.0)	4 (5.0)	21 (26.2)	45 (56.2)	10 (12.5)
7. I believe that AI applications will be widely used in pharmacy practice	1 (1.2)	3 (3.8)	22 (27.5)	45 (56.2)	9 (11.2)
8. I believe that AI can multitask more effectively than humans and analyze data more quickly	2 (2.5)	6 (7.5)	19 (23.8)	38 (47.5)	15 (18.8)
9. I feel that AI can improve patient outcomes	1 (1.2)	4 (5.0)	23 (28.7)	46 (57.5)	6 (7.5)
10. I feel that AI can reduce the cost of care	2 (2.5)	5 (6.2)	27 (33.8)	37 (46.2)	9 (11.2)
11. I feel that AI will improve pharmacy patient satisfaction	2 (2.5)	7 (8.8)	28 (35.0)	28 (35.0)	15 (18.8)
12. I feel that AI will assist in performing clinical investigation tasks more efficiently than humans	1 (1.2)	9 (11.2)	30 (37.5)	33 (41.2)	7 (8.8)
13. I fear that AI could replace my job as a pharmacist	11 (13.8)	22 (27.5)	27 (33.8)	14 (17.5)	6 (7.5)
14. I believe that AI always makes the best choice since it never gets tired (mentally or physically)	17 (21.2)	36 (45.0)	21 (26.2)	4 (5.0)	2 (2.5)

*Median Total Score
range 14 (low) to 70 (high)

50.5 IQR 46-55

RESULTS

Table 5: Confidence in the Use of AI

Confidence Level	N (%)
Not at all confident	19 (23.8)
Slightly confident	24 (30)
Moderately confident	31 (38.8)
Very confident	6 (7.5)

Table 6: CDS trust and clinical influence with willingness and attitude scores

Predictor	Outcome	p	p-value
Trust in AI CDS	Willingness	0.231	0.074
	Attitude	0.399	0.001
Frequency of clinical influence	Willingness	0.354	0.005
	Attitude	0.363	0.004
Trust x Influence	--	0.426	<0.001

- Self-rated AI knowledge strongest predictor of attitude & willingness ($p < 0.01$)
- Endorsing more barriers significantly associated with less positive attitudes ($p = 0.005$), but not willingness
- Higher AI confidence significantly associated with more positive attitude ($p < 0.01$), while prior AI use was not
- A high demand for AI training in all facets

CONCLUSIONS

- Despite low confidence in the use of AI telepharmacy staff have a high willingness to apply AI tools in their practice and have a positive attitude towards implementation
- High agreement on all perceived barriers towards integration of AI into pharmacy practice



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