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Patient Satisfaction with Antituberculosis Medication Counselling: A Comparison of Services Provided by Pharmacists and Nurses

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ABSTRACT

Background and Objective: The BC Centre for Disease Control (BCCDC) is a provincial organization responsible for managing all aspects of tuberculosis control. The centre houses its own pharmacy, which gives pharmacists the opportunity to interact directly with patients. Evaluating patient satisfaction is an important method of measuring the quality of pharmaceutical services. A questionnaire was developed to measure patient satisfaction with counselling on antituberculosis medication and to compare rates of satisfaction with services provided by nurses and pharmacists.

Methods: The VSQ-9 (a visit-specific satisfaction instrument developed by RAND Health Surveys, Santa Monica, California) was modified to focus on medication counselling. Each patient received medication counselling from a pharmacist or a nurse and was asked to rate his or her satisfaction with the counselling; ratings for pharmacists and nurses were compared. Patients' knowledge about their medications was also determined.

Results: Overall satisfaction with counselling by pharmacists and nurses was similar (mean ± standard deviation: 4.2 ± 0.68 and 4.3 ± 0.73, respectively; maximum score 5; $p = 0.48$). Mean assessments of patients' knowledge were similar for patients counselled by pharmacists and those counselled by nurses (4.7 ± 0.56 and 4.8 ± 0.49, respectively; $p = 0.48$). Patients indicated greater satisfaction with explanations of medication side effects provided by pharmacists than those provided by nurses (4.3 ± 0.69 and 4.1 ± 0.76, respectively; $p = 0.18$) and with the written information provided by pharmacists (4.1 ± 0.90 and 3.7 ± 0.84, respectively; $p = 0.03$). However, there was a trend toward patients receiving more assistance with management of side effects from the nurses than from pharmacists (4.4 ± 0.75 and 4.1 ± 0.84, respectively; $p = 0.06$).

Conclusion: Patients' overall ratings of their satisfaction with counselling provided by pharmacists and nurses were not significantly different. The high patient satisfaction levels and the associated patient knowledge levels observed in this study illustrate the benefit of the additional counselling support provided by pharmacists. The importance of using written information as a counselling tool was demonstrated by the high

RÉSUMÉ

Historique et objectif : Le BC Centre for Disease Control (BCCDC) est un organisme provincial responsable de gérer tous les aspects inhérents à la surveillance de la tuberculose. Le centre possède sa propre pharmacie, ce qui donne aux pharmaciens l'occasion d'interagir directement avec les patients. L'évaluation de la satisfaction des patients est une façon importante de mesurer la qualité des services pharmaceutiques. Un questionnaire a donc été conçu pour connaître dans quelle mesure les patients sont satisfaits des conseils qu'ils ont reçus sur les médicaments antituberculeux et pour comparer les taux de satisfaction entre les services fournis par les infirmières et infirmiers et ceux fournis par les pharmaciens.

Méthodes : Le questionnaire VSQ-9 (outil de mesure de la satisfaction pour une visite donnée, conçu par Rand Health Surveys, de Santa Monica, en Californie) a été modifié pour porter principalement sur les conseils en matière de médicaments. Chaque patient a reçu des conseils sur les médicaments d'un pharmacien, d'une infirmière ou d'un infirmier et on lui a demandé d'évaluer son degré de satisfaction, puis on a comparé les résultats pour les pharmaciens à ceux pour les infirmières et infirmiers. On a également déterminé la connaissance qu'avaient les patients de leurs médicaments.

Résultats : Dans l'ensemble, le degré de satisfaction des conseils prodigués par les pharmaciens, les infirmières et infirmiers était semblable (4,2 ± 0,68 et 4,3 ± 0,73, respectivement; cote maximale 5; $p = 0,48$). Le niveau de connaissance moyen des médicaments était également semblable pour les patients qui ont reçu des conseils d'un pharmacien et pour ceux qui ont reçu des conseils d'une infirmière ou d'un infirmier (4,7 ± 0,56 et 4,8 ± 0,49, respectivement; $p = 0,48$). Les patients ont déclaré être plus satisfaits des explications sur les effets secondaires qu'ils ont reçues des pharmaciens que de celles données par les infirmières et infirmiers (4,3 ± 0,69 vs 4,1 ± 0,76, respectivement; $p = 0,18$) et de l'information écrite remise par les pharmaciens (4,1 ± 0,90 vs 3,7 ± 0,84, respectivement; $p = 0,03$). En revanche, on a observé une tendance à une assistance accrue dans la prise en charge des effets secondaires de la part des infirmières et infirmiers, comparativement aux pharmaciens (4,4 ± 0,75 vs 4,1 ± 0,84, respectivement; $p = 0,06$).

Conclusion : Dans l'ensemble, la satisfaction des patients pour les conseils prodigués par les pharmaciens, les infirmières et

level of satisfaction among patients who were counselled by pharmacists. Future directions suggested by this research include pharmacist participation in counselling patients with active tuberculosis to improve adherence with antituberculosis therapy.

Key words: patient satisfaction, pharmacists, questionnaires, tuberculosis, counselling

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infirmiers n'était pas significativement différente. Le degré de satisfaction élevé des patients et leur niveau de connaissances élevé des médicaments, comme le montre cette étude, illustrent l'avantage du soutien additionnel des pharmaciens en matière de conseils. L'importance de fournir des renseignements écrits aux patients comme véhicules de conseils a été objectivée par le degré élevé de satisfaction des patients qui ont reçu des conseils d'un pharmacien. Les avenues de recherche futures qui se dégagent de cette étude comprennent la participation du pharmacien aux conseils prodigués aux patients atteints de tuberculose évolutive, afin que ceux-ci améliorent leur observance au traitement antituberculeux.

Mots clés : satisfaction du patient, pharmaciens, questionnaires, tuberculose, conseils

INTRODUCTION

Although overall rates of tuberculosis (TB) in Canada are low, the previous gradual decline in disease rates has reached a plateau.[1-3] In both the United States and Canada certain groups remain at high risk for TB, most notably foreign-born residents, who represent over 50% of cases.[4] Other groups at high risk include Canadian-born Aboriginal people, high-risk inner-city groups (including injection drug users and homeless people), and those with HIV infection.[2,3]

Control of TB in Canada includes administering antituberculosis medication to those with active disease and preventive treatment to those with latent TB infection. The most serious problem hindering TB treatment and control is noncompliance with therapy, which delays sputum conversion to smear negativity, increases relapse rates, and increases the emergence of drug-resistant mutant strains.[5]

Adherence to treatment requires the active participation of the patient in self-management of treatment and cooperation between the patient and the health care provider. The reasons for poor adherence are multifaceted and complex, and include lack of knowledge about medications and their side effects. Pharmacists who dispense antituberculosis medications provide counselling to enhance patients' understanding of why they are taking the medication and the potential side effects of treatment, thereby helping to ensure patient adherence. The pharmacist's role in advocating patient compliance is important for eradicating disease and for preventing relapse and development of resistant strains.[5]

The BC Centre for Disease Control (BCCDC) is a provincial organization with a mandate to control and eliminate communicable diseases within British Columbia.[6] The Division of Tuberculosis Control of the BCCDC provides clinic services for the prevention and treatment of TB. Nurses in the TB Clinic have traditionally counselled patients about their antituberculosis medications; however, in January 2002 medication counselling was taken over by pharmacists for 3 days each week. The pharmacy is housed within the centre, which allows direct patient consultation and gives the pharmacists access to each patient's drug profile through Pharmanet, the provincial prescription database.

Previous studies have focused on the pharmacist's ability to meet patients' need for health care services in the community and hospital settings.[7-9] In these studies, the level of patient satisfaction with counselling has reflected the quality of care. In addition, a satisfaction instrument may be applied to evaluate a pharmacist's performance. Larson and others[7] developed a 20-item self-administered questionnaire to measure patient satisfaction with medication counselling, which allowed pharmacists to pinpoint with confidence the areas of their practice most urgently requiring improvement. In the study by Pickrell and others[8] the level of pharmacist intervention was correlated with improvements in patients' knowledge and recall of medicines. In that study, the follow-up period for the patient's recall was limited to 2 weeks after discharge, and the authors suggested that it might be necessary to counsel the patient each time a supply of drugs was dispensed. The study reported here was initiated to compare patient satisfaction with counselling services provided by pharmacists and nurses.

METHODS

Patient Selection

Ambulatory patients with latent TB infection and active extrapulmonary disease with *Mycobacterium tuberculosis*, as well as those with atypical mycobacterial disease, were surveyed for satisfaction with counselling services. Patients with active pulmonary TB were excluded

because air exchange in the pharmacy was inadequate (as defined by the Canadian Standards Association[10]). Each patient was receiving at least one antituberculosis medication (rifampin, isoniazid, ethambutol, pyrazinamide, levofloxacin, ciprofloxacin, or pyridoxine).

Data Collection

Once a physician at the BCCDC prescribes antituberculosis medication, the patient is given a 1-month supply, either by the nurse at the TB Clinic (on Mondays and Tuesdays) or by the pharmacist in the BCCDC pharmacy (on Wednesdays through Fridays). Counselling about TB medications is conducted at that time. Thus, during this study, patients receiving their drugs on Monday or Tuesday received medication counselling from a nurse and those who received their drugs on Wednesday, Thursday, or Friday were counselled by a pharmacist. Patients normally return for a follow-up visit with the physician within 2 to 4 weeks. The nurses in the TB Clinic administered the satisfaction questionnaire to the patients at the time of follow-up.

Questionnaire

Questionnaires are an effective vehicle for obtaining feedback on patients' counselling experiences when direct observation is not feasible. The feedback from these questionnaires can help to identify differences in levels of care and can assist in pinpointing areas for future improvement. The VSQ-9 (Visit-Specific Satisfaction Questionnaire) by RAND Health Surveys (Santa Monica, California) was modified to focus on elements related to medication counselling.[11-13] Patients used a 5-point Likert scale to rate their level of satisfaction on 6 aspects of medication counselling (Appendix 1). Content validity was established through an interactive review process involving a panel of 5 reviewers (2 physicians, 2 pharmacists, and 1 nurse, all from within the facility), who were asked to evaluate the clarity and conciseness of each item in the satisfaction questionnaire. In addition to questions about satisfaction with counselling services, the survey included questions to determine the patient's knowledge about 5 aspects of the drug regimen, for which the patient's response was coded as known or unknown (Appendix 2).[14] The reliability of the scales used for the patient satisfaction questionnaire was tested by application of Cronbach's α coefficient ($\alpha < 0.70$).

Statistical Analysis

Data were analyzed by means of SPSS 10 statistical software (SPSS, Inc, Chicago, Illinois). Statistics on the questionnaire items were computed, including means, standard deviations, 95% confidence intervals, and significance values ($p < 0.05$). Mean scale scores were computed by summing the scores for individual questions and dividing by the number of responses. The mean scale scores for each question and the overall scores were compared between groups. The significant differences in satisfaction and patient knowledge between groups were assessed using ordinal logistic regression. An ordinal logistic regression model was used to predict the odds of achieving a higher satisfaction score. The natural log e (the base of natural logarithms) was raised to an exponent equal to the logit parameter estimate to calculate the odds ratio. This was an appropriate statistical test because the data were ordinal in nature and the results were more meaningful when expressed in terms of estimated probability of a higher score. Because of the small sample size, Fisher's exact test was used to test the differences in knowledge ratings between the 2 groups. The level of significance was set at $p < 0.05$. Variables derived from test instruments are declared to be reliable only when they provide stable and reliable responses with repeated administration of the test. Cronbach's α is used to test the reliability of the variables derived from summated scales. In addition, this test shows that if the same questions were readministered to the same respondents, the results would be similar.[15] The reliability of the patient satisfaction questionnaire was tested by applying the Cronbach's α coefficient calculated by SPSS and setting the benchmark α level at less than 0.70.[16]

RESULTS

A total of 100 subjects were recruited, 50 of whom were counselled by pharmacists and 50 by nurses. All participants completed the initial interviews over a period of 1 month. The overall mean scores for the level of satisfaction with counselling were not significantly different between patients counselled by pharmacists and those counselled by nurses (4.2 ± 0.68 and 4.3 ± 0.73, respectively; $p = 0.48$) (Table 1). Satisfaction scores for pharmacists and nurses were similar with regard to giving instructions on medication dose and schedule, providing information about adverse reactions, and courtesy and respect. However, there was a trend toward greater satisfaction with advice provided by nurses regarding appropriate action to be taken by the patient should a side effect occur.

Pharmacists used the written pamphlet information as a counselling aid more than nurses, and patients counselled by pharmacists had significantly greater satisfaction with the written information given to them as a take-home reference (4.1 ± 0.90 and 3.7 ± 0.84, respectively; $p = 0.03$).

Table 2 presents the results in terms of logistic regression predicting the odds ratio of satisfaction with counselling items. Patients counselled by pharmacists were more likely to be very satisfied with information provided about adverse effects (1.66:1). As well, patients found the written information provided by pharmacists more meaningful when used in conjunction with the pharmacist's counselling (2.28:1).

Table 1. Patient Satisfaction with Medication Counselling

Question*	Counselling by Pharmacist (*n* = 50)		Counselling by Nurse (*n* = 50)		*p* value†
	Mean Score (SD)	95% CI	Mean Score (SD)	95% CI	
Understanding of instructions	4.3 (0.85)	4.0–4.5	4.5 (0.64)	4.3–4.7	0.19
Satisfaction with adverse event information	4.3 (0.69)	4.1–4.5	4.1 (0.76)	3.9–4.4	0.18
Understanding of side effect management	4.1 (0.84)	3.9–4.3	4.4 (0.75)	4.2–4.6	0.06
Usefulness of pamphlet information	4.1 (0.90)	3.8–4.3	3.7 (0.84)	3.4–3.9	0.03
Courtesy, respect, sensitivity, and friendliness	4.5 (0.68)	4.3–4.7	4.5 (0.67)	4.3–4.7	0.79
Overall satisfaction with counselling	4.2 (0.68)	4.0–4.4	4.3 (0.73)	4.1–4.5	0.48

SD = standard deviation, CI = confidence interval.
*Coded as follows: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent.
†Fisher's exact test.

Table 2. Odds Ratios for Pharmacy Response

Question	Parameter Estimate*	Odds Ratio ($\log_e$)	95% CI
Understanding of instructions	–0.51	0.60	0.28–1.28
Satisfaction with adverse event information	+0.51	1.66	0.79–3.52
Understanding of side effect management	–0.72	0.49	0.23–1.03
Usefulness of pamphlet information	0.08	2.28	1.07–4.87
Courtesy, respect, sensitivity, and friendliness	–0.10	0.90	0.41–1.98
Overall satisfaction with counselling	–0.27	0.76	0.36–1.61

*Log_e (parameter) with nursing as reference group.

Table 3. Patients' Knowledge of Medication Regimen*

Question	Counselling by Pharmacist (*n* = 50)		Counselling by Nurse (*n* = 50)		*p* value†
	No. (%)	95% CI	No. (%)	95% CI	
Reason for medications	47 (94)	46.9–47.1	50 (100)	NA	0.24
Knowledge about dose of medication	49 (98)	48.9–49.1	48 (96)	47.9–48.1	>0.99
Ability to recall 2 side effects	45 (90)	44.9–45.1	49 (98)	48.9–49.1	0.20
Knowledge of management of side effects	48 (96)	47.9–48.1	48 (96)	47.9–48.1	>0.99
Knowledge about missed doses	48 (96)	47.9–48.1	45 (90)	44.9–45.1	0.44
Mean sum of scores (SD)	4.7 (0.56)	4.6–4.9	4.8 (0.49)	4.7–4.9	0.48

CI = confidence interval, NA = not applicable, SD = standard deviation.
*Each patient was scored as follows: 0 = response unknown, 1 = response known. Except where indicated otherwise, the data are presented as number of patients given a score of 1 (with percent and 95% confidence interval).
†Fisher's exact test.

The mean scores for patients' knowledge about TB medications were similar for patients counselled by pharmacists and those counselled by nurses (4.7 ± 0.56 and 4.8 ± 0.49, respectively; $p = 0.48$) (Table 3). Fisher's exact test was used to detect differences between the 2 groups, but the results were insignificant because of the small sample size and the small number of failures (i.e., patients coded as response unknown).

DISCUSSION

Patient satisfaction is a subjective measure and depends on the patient's preferences and perceived expectations.[7] In this small survey, the patients demonstrated an overall high level of satisfaction with counselling services provided by both pharmacists and nurses. Patients expressed greater satisfaction with the information about medication side effects that was provided by pharmacists, and there was a trend toward greater satisfaction with information about side effect management provided by nurses.

Subject selection was nonrandom, but was probably unbiased because subjects for both groups were drawn from the same sample population according to the same inclusion criteria. In addition, recall bias, a common criticism of data obtained by questionnaire, can be discounted because there was a high level of patient recall (see Table 3), and insignificant time lapse between

events (2 to 4 weeks). This short data collection period assisted in limiting recall bias but might not have been sufficient in duration to represent patients' knowledge retention over the long term. An increase in the number of subjects would have maximized the statistical power for the satisfaction survey and knowledge assessment (i.e., by decreasing the chance of type II errors). With regard to the survey format, despite the fact that simple language was used, the participants for whom English was not their first language had more difficulty in completing the questionnaire.

When a Likert scale is used for questionnaire responses, numbers are arbitrarily assigned to categories (e.g., poor = 1 and excellent = 5). Traditionally, the data are treated as real numbers by application of statistical tests to calculate means and standard deviations. However, applying ordinal logistic regression to data in ordered categories is a better method of analyzing the data where the probability of answering within a category can be expressed in terms of an odds ratio. As shown for question 2 (satisfaction with information about adverse effects), pharmacists demonstrated an increase in the odds ratio for receiving a higher response (1.66:1). The internal consistency of the scales measured by Cronbach's α was well above the expected satisfactory value, which indicates that the generated scale was reliable and the results were reproducible (α = 0.8823, expected value 0.70).[15,16]

The patients demonstrated a high level of knowledge of their medication regimens, which illustrates the benefit of additional support provided by pharmacists. These results are consistent with results from previous studies showing that pharmacist intervention improves patients' ability to recall their medication and increases patients' knowledge of side effects after medication counselling.[8,9] In addition, the pharmacist's involvement in the TB counselling program has been beneficial in ensuring that drug histories are more accurate and complete.

Patient satisfaction has practical implications for improving the quality of pharmaceutical care. These results indicate that pharmacists and nurses consulting with patients on medication use can increase overall levels of patient satisfaction. Pharmacists and nurses working cooperatively with the patient can promote the correct use of and access to medicines while emphasizing the importance of medication adherence to achieve the BCCDC mandate to control and eliminate active TB while preventing the emergence of drug resistance. This appropriate collaboration of health care professionals is reflected by the philosophy of teamwork at the BCCDC. The close proximity of the pharmacy to the TB Clinic allows for direct patient consultation and review of antituberculosis medication by the pharmacist. Furthermore, the pharmacist's participation in counselling for 3 days per week has helped to reduce the nursing workload, which allows nurses more time for contact tracing, skin testing, and reporting.

Future directions suggested by this research may include pharmacist participation in counselling patients with active tuberculosis, who often have concomitant respiratory illnesses, complex drug histories, and the possibility of drug interactions. As well, the pharmacist's role may be expanded to include follow-up, including summarizing prior drug therapy and observed responses to treatment. There is now a need for further work to determine if there is an impact on clinical outcomes such as improving adherence to antituberculosis therapy and decreasing the risk of treatment failure and drug-induced hepatitis. Prospective studies should incorporate measures of patient recall and rates of adherence to the antituberculosis regimen.

CONCLUSIONS

This patient survey demonstrated high levels of satisfaction with counselling services provided by both pharmacists and nurses. There was significantly higher patient satisfaction with the written pamphlet information used as a counselling aid by pharmacists. By providing a medication pamphlet for the patient to review at home, pharmacists can reinforce in writing important counselling points that might be easily missed by the patient during the initial interview. Pharmacists and nurses working cooperatively with the patient can promote the correct use of and access to medicines while emphasizing the importance of medication adherence to ensure a lasting cure of active TB and prevention of acquired drug resistance.

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Appendix 1. Patient Satisfaction Survey

Thinking about your visit at the TB Clinic today, please rate the information provided about the medication*

1. Your understanding of dose and time schedule after speaking with the health care professional
2. Your satisfaction with the information received from the health care professional about the adverse effects of the medications
3. Your understanding of what to do if side effects occur
4. Usefulness of the information about the medication provided in the written pamphlet
5. Courtesy, respect, sensitivity, and friendliness of the health care professional
6. How beneficial the medication counselling was overall

*Patients were asked to rate each question on the following scale: 1 (poor), 2 (fair), 3 (good), 4 (very good), or 5 (excellent).

Appendix 2. Patient's Knowledge of Regimen

Thinking about the TB medications that you took in the past weeks, please answer the following questions*

1. Do you know why you are taking TB medications?
2. How many tablets did you take each time?
3. Can you recall 2 side effects related to this medication?
4. Do you know what to do should a side effect occur?
5. Do you know what to do if you forget to take the medication?

*Items were coded as follows: unknown = 0, known = 1.