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Original article

Comparison of pharmaceutical therapy-related quality of life of patients treated by staff and resident physicians

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Background: No data were available about the relationship between pharmaceutical therapy-related quality of life of patients and types of physicians.

Objectives: This study aimed to compare the pharmaceutical therapy-related quality of life of patients treated by staff and resident physicians.

Methods: This study was a cross-sectional survey and was conducted in three public university hospitals in Bangkok, Thailand, between July 2014 and March 2015. A convenience sample of 1,156 outpatients aged 18 years or over who were continuously taking any medicines to treat a chronic disease for at least three months was included. The Patient-Reported Outcomes Measure of Pharmaceutical Therapy for Quality of Life (PROMPT-QoL) questionnaire was used to measure the pharmaceutical therapy-related quality of life. The PROMPT-QoL had 42 items including eight domains. The associations between type of physicians and PROMPT-QoL item, domain, and total scores were tested by multiple linear regressions which included three confounders including, age, disease groups, and the number of medicines per day. An effect size was calculated employing the difference in mean scores divided by pooled standard deviations.

Results: The patients treated by staff physicians (n = 644) had four significantly higher domains scores and total score than those treated by resident physicians (n = 512). The four domains included receiving medicine and disease information from healthcare providers, satisfaction with medicine effectiveness, therapeutic relationship with healthcare providers, and overall quality of life. However, the effect sizes to detect differences in PROMPT-QoL scores between the two groups were small.

Conclusion: Resident physicians may have more training on medicine therapy or pharmaceutical care provision to improve this patient-reported outcome.

Keywords: Pharmaceutical therapy, patient-reported outcome, physician, quality of life, Thailand.

Patient-reported outcome (PRO) measures are gaining popularity and are important as a tool in patient management. [1] A PRO refers to any reports of the status of a patient's health condition that comes directly from the patient, without interpretation by a clinician or anyone else. [2] They include symptom burden, functioning, health status, and health-related quality of life (HRQoL). [1] HRQoL is the most common PRO which is the impact of disease and treatment on patients' physical, psychological and social functioning from their own perspective. [3]

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HRQoL of patients suffering from a disease can be improved by pharmaceutical therapy. Nevertheless, it also can cause undesirable effects including misunderstanding of drug use, adverse effects and their impacts, fear or concern of medicine use, and inconvenience. [4] Therefore, pharmaceutical therapy-related quality of life (PTRQoL) assessment is crucial. Murawski MM, *et al.* defined PTRQoL as the gap or difference between theoretically maximal obtainable and observed HRQoL post-treatment. [5] Therefore, healthcare providers should reduce this gap to enhance patients' HRQoL.

In teaching university hospitals, medical residency programs are essential to produce specialist physicians who are experts in treating specific diseases. However, maintaining quality, safety, and outcomes of patient care are also very important. Several studies investigated the clinical outcomes of patients treated

by resident and staff physicians and found that they did not significantly differ between the two groups. [6-10] However, a study reported that resident participation was associated with significantly increased phacoemulsification operative times and costs during the first half of the academic year. [11] Hence, the performances of resident physicians when compared with staff physicians are still controversial. Moreover, no previous studies have determined the differences in PTRQoL of patients treated by resident and staff physicians. Thus, this study aimed to evaluate this relationship.

Materials and methods

Sample and procedure

This study utilized the data from the project "Psychometric properties of the Patient-Reported Outcomes Measure of Pharmaceutical Therapy for Quality of Life (PROMPT-QoL). [12]" This was a cross-sectional study and was conducted in three public university hospitals in Bangkok, Thailand, between July 2014 and March 2015. A convenience sample of 1,156 patients was included. Inclusion criteria were outpatients aged 18 or over who were continuously taking any medicines to treat a chronic disease for at least three months. Exclusion criteria were patients with cognitive impairment or with communicative or psychiatric problems such as schizophrenia. Of all 1,156 patients, 644 and 512 patients were treated by staff and resident physicians, respectively. While waiting to see their physicians at the hospitals, they did the PROMPT-QoL questionnaire either by self-administrations or by face-to-face interviews by one of three research assistants without any explanation of the items' meanings. The study was approved by the Ethics Committees of the three hospitals (Certificate of Approval number: 329/2014, 2557/233, 718/2557). Written informed consent was obtained from all subjects.

Measurements

PROMPT-QoL

The PROMPT-QoL, a novel generic PTRQoL questionnaire [13], was used. It is in Thai and has 43 items including nine domains: general attitude toward medication use (1 item), medicine and disease information (9 items), medicine effectiveness (3 items), impacts of medicines and side-effects (8 items), psychological impacts of medication use (9 items), convenience (3 items), availability and accessibility (4 items), therapeutic relationship with healthcare providers (3 items), and overall QoL (3 items). The "General Attitude toward Medication Use" item provides respondents with four treatment types (medicines, alternative medicines, both, or other), and asks them to indicate their preferred type of treatment. The other 42 items' responses use a 5-point Likert-type scale from "not at all" to "very much", so only these items are summed to calculate eight PROMPT-QoL domain scores. A total score is a summation of the 42 items. The recall period of the PROMPT-QoL is today. The PROMPT-QoL had acceptable measurement properties including practicality, reliability, validity [12] and responsiveness. [14]

Item scores range from 1 to 5, with higher scores indicating better QoL. Observed domain and total scores are then converted to percentages (0 - 100) using the following formula: domain and total scores = 100* (observed score - minimum domain score)/(maximum domain score - minimum domain score). Higher domain and total scores indicate higher PTRQoL.

Statistical analysis

Patient characteristics were expressed as mean ± standard deviation (SD) for continuous variables, while frequencies and percentages were used for categorical variables. Differences in the patient characteristics between resident and staff groups were examined by unpaired *t* - tests and Chi-squared tests. The associations between type of physicians and PROMPT-QoL item, domain, and total scores were tested by multiple linear regressions which included confounders. A sensitivity to detect differences in PROMPT-QoL item, domain, and total scores between the two groups was determined using effect sizes. The effect size was calculated employing the difference in mean scores divided by pooled standard deviations. [15] The effect sizes of 0.2, 0.5, and 0.8 were considered as small, medium, and large effect sizes, respectively. [15] A *P* - value less than 0.05 was considered statistically significant. The data were analyzed using IBM SPSS version 22 (IBM Corp., Bangkok, Thailand).

Results

The patient characteristics between staff and resident groups are displayed in Table 1. It was found that age, disease groups, and the number of medicines per day significantly differed between the two groups. Hence, these three variables were treated as confounders to be adjusted in multiple linear regressions.

Table 1. Patient characteristics.

Characteristics	Staff group (n = 644)	Resident group (n = 512)	*P* - value
Age (year); Mean ± SD	51.5 ± 14.1	49.1 ± 14.6	0.006[a]
Gender; n (%)			0.620[b]
Male	305 (47.4)	250 (48.8)	
Female	339 (52.6)	262 (51.2)	
Education; n (%)			0.081[b]
Primary school	121 (18.8)	109 (21.3)	
Secondary school	58 (9.0)	58 (11.3)	
High school	112 (17.4)	103 (20.1)	
≥ College	353 (54.8)	242 (47.3)	
Disease groups; n (%)			< 0.001[b]
Cardiovascular disorders	49 (7.6)	62 (12.1)	
Respiratory disorders	49 (7.6)	16 (3.1)	
Gastrointestinal disorders	49 (7.6)	30 (5.9)	
Renal disorders	63 (9.8)	33 (6.4)	
Neurologic disorders	37 (5.7)	57 (11.1)	
Sleep and emotional disorders	39 (6.1)	25 (4.9)	
Endocrinologic disorders	47 (7.3)	53 (10.4)	
Gynecologic and urologic disorders	33 (5.1)	35 (6.8)	
Bone and joint disorders	61 (9.5)	40 (7.8)	
Ophthalmic nose and throat disorders	39 (6.1)	39 (7.6)	
Dermatologic disorders	26 (4.0)	49 (9.6)	
Hematologic disorders	27 (4.2)	30 (5.9)	
Infectious diseases	66 (10.2)	20 (3.9)	
Oncologic disorders	59 (9.2)	23 (4.5)	
Number of medicines per day; Mean ± SD	5.6 ± 3.5	4.8 ± 2.8	< 0.001[a]
Having an adverse drug reaction; n (%)			0.08[b]
Yes	344 (53.4)	247 (48.2)	
No	300 (46.6)	265 (51.8)	

Bold values indicate a significant value.
[a] Tested by unpaired *t* - tests; [b] Tested by Chi-squared tests

As shown in Table 2, the staff group had significantly higher medicine and disease information, medicine effectiveness, therapeutic relationship with healthcare providers, overall quality of life domain scores and total score than the resident group. As for item scores, the staff group provided significantly higher all item scores of the medicine and disease information, medicine effectiveness, and therapeutic relationship with healthcare providers domains than the resident group. Moreover, the staff group yielded significantly higher item scores of medicine interaction, medication and travel expenses, overall satisfaction with medication use, and happiness than the resident group. However, the resident group had significantly higher item score of impacts of medicines and side-effects on daily and social activities than the staff group. Effect sizes of statistically significant results ranged from 0.09 - 0.30, which was considered as small effect sizes.

Table 2. Comparison of pharmaceutical therapy-related quality of life item, domain and total scores of patients treated by staff and resident physicians.

PROMPT-QoL	Mean ± SD		*P* - value[a]	Effect size[b]
	Staff group (n = 644)	Resident group (n = 512)		
Receiving medicine and disease information	57.5 ± 20.4	52.8 ± 20.0	< 0.001	0.23
Drug name	3.3 ± 1.2	3.0 ± 1.2	0.001	0.25
Strength	2.8 ± 1.3	2.6 ± 1.3	0.003	0.15
Indication	3.8 ± 0.9	3.7 ± 0.9	0.004	0.11
How to use medicines	3.9 ± 0.9	3.7 ± 0.9	0.009	0.22
Reason for using medicines regularly	3.6 ± 1.1	3.4 ± 1.1	< 0.001	0.18
What to do if medicine doses are missed	2.6 ± 1.3	2.4 ± 1.3	0.004	0.15
Side-effects and management	2.9 ± 1.3	2.7 ± 1.3	0.004	0.15
Causes and prevention	3.5 ± 1.1	3.2 ± 1.1	< 0.001	0.27
Symptoms, severity, and treatment	3.5 ± 1.1	3.3 ± 1.1	0.004	0.18
Satisfaction with medication effectiveness	65.9 ± 20.0	62.9 ± 21.3	0.006	0.15
Symptom relief	3.8 ± 0.8	3.7 ± 0.9	0.005	0.12
Cure at first time	3.7 ± 0.9	3.6 ± 1.0	0.023	0.11
Onset of medicine action	3.5 ± 0.9	3.3 ± 1.0	0.017	0.21
Impacts of medicines and side-effects	86.4 ± 15.6	88.4 ± 13.8	0.091	0.14
Mobility, energy, pain, and discomfort	4.3 ± 1.0	4.4 ± 0.9	0.102	0.11
Sleep	4.3 ± 0.9	4.4 ± 0.9	0.693	0.11
Memory and cognition	4.5 ± 0.8	4.6 ± 0.7	0.607	0.13
Appearance or body skin	4.4 ± 1.0	4.4 ± 1.0	0.672	0
Eating, digestion, or stool passing	4.4 ± 1.0	4.5 ± 0.8	0.149	0.11
Vision, hearing, and speech	4.7 ± 0.7	4.8 ± 0.6	0.108	0.15
Intercourse and sexual desire	4.7 ± 0.8	4.8 ± 0.6	0.171	0.14
Daily activities or socializing with others	4.5 ± 0.9	4.6 ± 0.8	0.029	0.12
Psychological impacts of medicine use	70.4 ± 22.1	70.0 ± 21.9	0.873	0.02
Medicine side effect	3.6 ± 1.2	3.6 ± 1.2	0.676	0
Feeling bored with taking medicine every day	3.7 ± 1.3	3.7 ± 1.2	0.630	0
Medicine resistance or ineffectiveness	3.8 ± 1.2	3.8 ± 1.2	0.682	0
Medicine dependence	3.4 ± 1.4	3.4 ± 1.4	0.826	0
Changing type/strength of medicine	3.8 ± 1.2	3.8 ± 1.2	0.513	0
Taking many medicines	3.6 ± 1.3	3.6 ± 1.3	0.233	0
Taking medicine in front of others	4.5 ± 0.9	4.6 ± 0.8	0.094	0.12
Medicine interaction	4.0 ± 1.1	3.8 ± 1.2	0.027	0.17
Taking medicine makes you less healthy than person with the same age	3.9 ± 1.2	3.8 ± 1.2	0.260	0.08
Convenience	67.2 ± 19.5	66.1 ± 19.0	0.164	0.06
Appropriate dosage forms	3.6 ± 0.9	3.6 ± 1.0	0.250	0
Convenience of use	3.6 ± 1.0	3.6 ± 0.9	0.293	0
Ease of carrying medicines around	3.8 ± 0.9	3.8 ± 0.9	0.280	0
Availability/Accessibility	73.7 ± 17.1	73.1 ± 17.7	0.575	0.03
Medicine availability in a setting	4.4 ± 0.9	4.5 ± 0.9	0.437	0.11
Medication and travel expenses	4.4 ± 1.0	4.2 ± 1.1	0.040	0.19
Service process and waiting time	3.3 ± 1.0	3.3 ± 1.0	0.085	0
Travel or self-support to hospital	3.7 ± 1.2	3.8 ± 1.2	0.187	0.08
Therapeutic relationship with health care providers	76.0 ± 16.6	70.9 ± 17.3	< 0.001	0.30
Trust doctor's decision on medicine treatment	4.3 ± 0.7	4.1 ± 0.7	< 0.001	0.29
Friendly manners and willingness to answer medicine queries	4.0 ± 0.8	3.8 ± 0.9	0.001	0.24
Getting help to sort out medicine-related problems or concerns	3.8 ± 0.9	3.7 ± 0.9	0.002	0.11

Table 2. (Con) Comparison of pharmaceutical therapy-related quality of life item, domain and total scores of patients treated by staff and resident physicians.

PROMPT-QoL	Mean ± SD		*P* - value[a]	Effect size[b]
	Staff group (n = 644)	Resident group (n = 512)		
Overall quality of life	64.5 ± 18.4	61.2 ± 18.4	0.002	0.18
Satisfaction with medication use	3.8 ± 0.9	3.7 ± 0.9	0.001	0.11
Happiness	3.4 ± 0.9	3.2 ± 1.0	< 0.001	0.21
Improvement in daily life	3.6 ± 0.9	3.5 ± 0.9	0.343	0.11
Total score	70.4 ± 11.3	68.7 ± 11.3	0.003	0.09

Bold values indicate a significant value.

[a] Tested by multiple linear regressions which adjusted for confounders including age, disease groups, and the number of medicines per day.

[b] The difference in mean scores between staff and resident groups divided by pooled standard deviations.

Discussion

To our knowledge, this is the first study to compare pharmaceutical therapy-related quality of life of patients treated by staff and resident physicians. The patients treated by staff physicians reported that they were more explained about medicine and disease information, were more satisfied with medicine effectiveness, had higher therapeutic relationships, overall QoL and total score than those of resident physicians. However, the sensitivities to detect differences in PROMPT-QoL scores between the two groups were small. This is not consistent with other previous studies which found that the performances of resident physicians were similar to those of staff physicians. [6 - 10]

Unsurprisingly, the staff physicians provided more information about medicine and disease and therapeutic relationships to the patients than the resident physicians. Additionally, the patients treated by staff physicians were more satisfied with medicine effectiveness, less worried with medicine interaction, had fewer problems with medication and travel expenses and higher overall satisfaction and happiness with medicine use. A possible reason for these higher scores is because the staff physicians have more knowledge, skills, and experiences to solve the patients' drug-related problems than the resident physicians. This study is in line with a previous study reporting that primary care resident physicians had a discussion of side-effects and an assessment of how well the medication was working in only 11.1% and 33.3% of the patients who were prescribed antidepressants. [16] Thus, the previous study suggested that they need further training on the importance of monitoring patients on antidepressants.

Nevertheless, the resident group provided significantly higher score of the impacts of medicines and side-effects on daily activities or socializing with others than the staff group. A possible explanation is that the patients of the staff group had higher proportion of developing adverse drug reactions than those of the resident group (53.0% and 48.0%, respectively), but there was not significantly different ($P = 0.08$).

A previous study found that patients older than 50 years and taking more than 5 medicines per day were more likely to have less PTRQoL. [12] However, the patients treated by staff physicians were older and had higher number of medicines than those treated by resident physicians, but they still had higher PTRQoL.

The results of this study can imply that resident physicians may need more training on medicine therapy to provide more medicine and disease information and create more therapeutic relationships such as trust with patients. Moreover, since university hospitals in Thailand have many outpatients per day, they should have enough staff physicians to treat patients and train residents.

This study had some limitations, however. Firstly, since the nature of this study was cross-sectional, the causality of the relationship between PTRQoL outcomes and types of physicians could not be ascertained. Thus, future study should employ a prospective design. Secondly, since most of the patients knew who treated them and Thai patients quite respect staff physicians, they might please them by giving more positive answers. Hence, further study should blind the patients.

Conclusions

This study has shown that the pharmaceutical therapy-related quality of life of patients treated by staff physicians was higher than those treated by resident physicians. Resident physicians may have more training on medicine therapy or pharmaceutical care provision to improve this patient-reported outcome.

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Conflict of interest

The author, hereby, declare no conflict of interest.

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