

## Influence Specificities of the Type of Attitude towards a Disease on Physical Therapy Satisfaction Among the Orthopedic Profile Patients and the Possibilities of Attitude Improvement

SERGII FEDORENKO<sup>1</sup>, VOLODYMYR VITOMSKYI<sup>2</sup>, OLENA LAZARIEVA<sup>3</sup>, VITALIY KASHUBA<sup>4</sup>,  
OLENA ANDRIEIEVA<sup>5</sup>, MARYNA VITOMSKA<sup>6</sup>, POTOP VLADIMIR<sup>7</sup>, LYTVYNENKOYURIY<sup>8</sup>  
<sup>1,2,3,4,5,6,8</sup>National University of Ukraine on Physical Education and Sport, Kyiv, UKRAINE

<sup>7</sup> Ecological University of Bucharest, Bucharest, ROMANIA

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### Abstract

#### *Purpose:*

To determine the level of physical therapy satisfaction among outpatients with orthopedic profile disorders, based on the type of attitude to the disease, and the possibilities of its improvement.

*Material:* The study involved 113 patients who completed a standard course of physical therapy during 2013–2015, and 135 patients who completed a course of physical therapy during 2016–2018 after physical therapy system modification. The level of patient's physical therapy satisfaction was measured by means of a Physical Therapy Patient Satisfaction Questionnaire (PTPSQ). Patients were grouped by the type of attitude to the disease (psychotypes). The course of physical therapy comprised 12–15 classes.

*Results:* The comparison of the results indicated a higher level of physical therapy satisfaction in almost half of the questionnaire domains in groups of the patients with rational psychotypes. Psychotypes influenced in particular the results of the "treatment", "privacy", "scheduling", "wait time", "overall satisfaction" domains. The largest difference was observed in the "treatment" domain. The overall satisfaction score also confirmed a higher level of outpatient physical therapy satisfaction in groups of the patients with a rational attitude to the disease. Comparing scores of physical therapy satisfaction in the groups with similar psychotypes but different physical therapy programs confirmed the advantages of a modified system of physical therapy and implemented measures in several questionnaire domains. In particular, when comparing 2013–2015 patients and 2016–2018 patients, both with rational psychotypes, we observed significant advantages of 2016–2018 patients in the "treatment", "overall satisfaction" domains and overall PTPSQ score. Similar comparison of the patients with irrational psychotypes, in addition to the differences mentioned, showed a statistical difference in the "privacy" domain as well. At the same time, when comparing the results of 2016–2018 patients with irrational psychotypes and 2013–2015 patients with rational psychotypes, we observed the advantages of the first ones in two domains ("treatment" and "privacy"). This confirms better performance of the means of a modified program and the measures of managing the system and physical therapy process itself at the outpatient level.

*Conclusions:* The results of the study confirm the influence of the specificities of the attitude to the disease on physical therapy satisfaction among orthopedic profile patients at the outpatient level. At the same time, constructive changes of the physical therapy system, enhancing the role of a physical therapist, and taking into account patient's characteristics in managing physical therapy process have a positive effect on satisfaction.

**Keywords:** physical rehabilitation, therapeutic exercises, musculoskeletal disorders, outpatient program, quality of service.

### Introduction

The development of patient-centered health care systems is now a dominant paradigm in providing healthcare services. In this context, patient satisfaction level has become an important indicator of patient care quality [2, 8, 16, 18].

At the same time, there is an increase of interest in measuring patient healthcare satisfaction, which reflects changes in the market for patient-centered services [1, 3]. This trend indicates the existence of market competition. Patients who are fully satisfied with health care service are more likely to ask for additional services and recommend a medical institution to their friends [1].

According to the results of the survey by Hush, J. M. et al. [16], patients are fully satisfied with musculoskeletal physical therapy provided on an outpatient basis in Northern Europe, North America, Great Britain and Ireland. Interpersonal characteristics of a therapist and care process are key factors of patient satisfaction. Treatment results quite unexpectedly happened to be infrequently and inconsistently associated with

patient satisfaction. Physical therapists can enhance patient-centered care quality by understanding and optimizing these determinants of patient satisfaction.

Great importance of patient satisfaction is also proved by the fact that satisfied patients are more diligent in following therapist's recommendations and prescriptions, benefit more from healthcare system and health saving measures and have a higher quality of life [12, 14, 16, 21].

Service quality improvement is one of the main criteria in evaluating healthcare institutions [3, 7]. Healthcare authorities and insurance campaigns study patient satisfaction to identify the specificities of providing services and the ways to upgrade them. Patient satisfaction assessment is analyzed to ensure the quality of provided services and taken into account for accreditation of hospitals and primary healthcare institutions [16]. Patient physical therapy satisfaction and therapeutic alliance are as important for therapy effectiveness evaluation as effectiveness objective criteria.

Patients with musculoskeletal disorders often apply to outpatient clinics for physical therapist's help to get through the pain and improve mobility. Within the last decade, numerous authors have studied patient satisfaction with musculoskeletal physical therapy [4, 5, 15].

In particular, the studies concerned the impact of characteristics of physical therapy providers [19] and patients' age [20] on satisfaction.

Thus, the study of satisfaction with outpatient musculoskeletal physical therapy is an important research area. At the same time, the impact of the type of attitude to the disease on physical therapy satisfaction has not been investigated. In addition, it is appropriate to study patient satisfaction in terms of current healthcare reforms in Ukraine, as well as physical therapy modification impact of an outpatient private healthcare institution, which in its turn must be competitive in the service market.

**Coherence of the research with scientific plans and topics.** The research has been conducted in accordance with NUUPES 2016–2020 academic research plan on the topic: 4.2. "Organizational, theoretical and methodological basics of physical rehabilitation of people of different nosological, professional and age groups", State Registration Number 0116U001609.

**Aim of the research:** to determine physical therapy satisfaction level among outpatients with orthopedic profile disorders, based on the type of attitude to the disease, and the possibilities of its improvement.

## **Materials and Methods**

### *Organization of the research*

Patient physical therapy satisfaction was measured with the help of Physical Therapy Patient Satisfaction Questionnaire (PTPSQ-I). The questionnaire comprises 26 items and is divided into 2 parts [23]. The second part, used in the study, comprises 20 items which are related to patient satisfaction domains [13]: "treatment" (5 questions); "privacy" (1 question); "convenience of appointment time" (2 questions); "cost" (2 questions); "billing" (1 question); "ease of scheduling an appointment" (1 question); "scheduling" (2 questions); "wait time" (1 question); "courteous staff" (1 question); "PT polite" (1 question); "overall satisfaction" (3 questions). Each item corresponds to 0–4 score. PTPSQ total score is obtained by adding all scores of the questions except unmarked or missing ones and dividing the sum by the maximum score possible (the amount of questions of the second part is multiplied by 4, which corresponds to the highest score for each question). The coefficient is then converted to satisfaction percentage [14, 24]. Domain scores are calculated in a similar way.

### *Participants*

The study involved 113 patients who completed a standard course of physical therapy during 2013–2015, and 135 patients who completed a course of physical therapy during 2016–2018 after physical therapy system modification. The study was conducted at "FESCO" Medical Center (Bila Tserkva, Ukraine).

The samples included the patients who had properly completed the questionnaires after giving permission to collect, store, and process the obtained data; worked at least 15 hours per week, did not have comorbid conditions, and had systematically completed the whole course. The groups of 2013–2015 patients were denoted by letter G, and the groups of 2016–2018 patients were denoted by letter M (modified program).

The methods of determining types of attitudes to the disease [0] were used to check the presence of patient's personality influence on the assessment of physical therapy satisfaction. Thus, attitude to the disease was a patients' grouping factor. According to the literature data [6, 17, 22], which refer harmonious, ergopathic and anosognostic types of reaction to the "rational" ones, 2013–2015 patients were divided into group G+ (n=58, rational types of reaction to the disease) and G- (n=55, irrational); 2016–2018 patients were divided into M+ group (n=71) and M- (n=64) group.

### *Intervention*

Standard course of physical therapy comprised 12–15 classes (40–60 minutes each; therapeutic physical exercises and mechanotherapy according to the doctor's prescription), physiotherapy (magneto therapy, electromyostimulation according to the doctor's prescription) and massage (7–8 procedures). Course duration was 5–6 weeks. Modified course of physical therapy was supplemented with new therapeutic exercises (with elastic bands; with fitball; exercises in functional gymnastics according to Gray Institute (3D Maps); exercises

with postisometric relaxation). Besides, physical therapy system included a number of innovations to enhance the role of a physical therapist in physical therapy system (assessment of patient's condition; prescription and replacement of exercises, dosage, i.e. all those changes taking place based on the reforms in specialists' education, launching educational programs in cooperation with European and American professional associations, changes to the legislation on the profession of a physical therapist); to increase motivation of patients [11] and physical therapists [24]; to improve managing physical therapy process and service quality, and take into account characteristics of patients with irrational attitude to the disease [10].

*Statistical analysis.* The obtained results were processed by means of mathematical statistics using Statistica 7.0. and IBM SPSS Statistics 21 applications. Mean value ( $\bar{x}$ ), root-mean-square deviation (S), median value (Me), upper and lower quartiles (25%; 75%) were determined. To assess significance of the difference, Student's t-test (for independent groups) was used provided there was a normal distribution of study results; Mann-Whitney U-test (for independent groups) was used provided the indicators had a distribution other than normal.

It should be mentioned that 2016–2018 patients had no statistical differences in primary life quality results (SF–36, EQ–5D–5L) as compared with 2013–2015 patients, which was achieved by means of screening to improve the analysis of physical therapy satisfaction scores.

### Results of the research.

To assess the impact of the type of attitude to the disease, we compared the results of G+ and G– groups (table 1).

The first domain of the patient satisfaction questionnaire is "treatment", which reflects patient satisfaction with the treatment provided by a physical therapist; services provided by a physical therapist assistant; overall quality of a physical therapy, productivity of physical therapist's instructions, physical therapist's understanding of the patient's problem. The analysis of the "treatment" domain scores (table 1) revealed that Me (25%; 75%) indicators in G+ group were on 70 (65; 80)% level, and in G– group – on 60 (50; 75)% level. A statistically significant difference between the groups was determined ( $p < 0.01$ ). Thus,  $\bar{x}$  difference between the groups in this domain comprised 12.9%, which entitles us to believe that patients with rational psychotypes were more satisfied with the treatment.

Table 1

Average indicators of physical therapy satisfaction among patients grouped according to their psychotypes, %

Indicators		Groups	
		G+ (n=58)	G– (n=55)
Treatment	Me(25%;75%)	70(65; 80)	60(50; 75)**
	$\bar{x} \pm S$	73.45±10.69	60.55±11.61
Privacy	Me(25%;75%)	75(75; 75)	75(50; 75)*
	$\bar{x} \pm S$	74.14±8.06	69.55±12.45
Convenience of appointment time	Me(25%;75%)	63(50; 63)	63(50; 63)
	$\bar{x} \pm S$	59.05±10.93	59.55±10.75
Cost	Me(25%;75%)	75(50; 75)	75(50; 75)
	$\bar{x} \pm S$	70.69±13.96	70.45±13.90
Billing	Me(25%;75%)		
	$\bar{x} \pm S$	100.00±0.00	100.00±0.00
Ease of scheduling an appointment	Me(25%;75%)	75(75; 100)	75(75; 100)
	$\bar{x} \pm S$	86,64±12,58	85.91±12.51
Scheduling	Me(25%;75%)	75(75; 75)	75(50; 75)**
	$\bar{x} \pm S$	77.80±12.62	68.86±11.75
Wait time	Me(25%;75%)	75(75; 100)	75(75; 75)**
	$\bar{x} \pm S$	86.21±12.54	79.55±9.73
Courteous staff	Me(25%;75%)	75(75; 100)	75(75; 100)
	$\bar{x} \pm S$	86.64±12.58	85.00±12.36
PT courteous	Me(25%;75%)	75(75; 100)	75(75; 100)
	$\bar{x} \pm S$	86.64±12.58	85.00±12.36
Overall satisfaction	Me(25%;75%)	75(58.3; 91.7)	58.3(50; 75)**
	$\bar{x} \pm S$	73.71±15.,20	62.12±10.74
PTPSQ	Me(25%;75%)	76.3(71.3; 81.3)	71.3(65.0; 73.8)**
	$\bar{x} \pm S$	76.19±5.88	69.59±5.69

Note. \* – the difference between group indicators is statistically significant  $p < 0,05$ ; \*\* –  $p < 0,01$ .

The "privacy" domain was also significantly better in G+ patients ( $p < 0.05$ ). Their scores in support of privacy during physical therapy comprised 75 (75; 75) %; G– scores comprised 75 (50; 75)%. Difference between the groups in this domain was slightly smaller and comprised 4.6%.  $\bar{x} \pm S$  indicators were  $74.14 \pm 8.06$  % and  $69.55 \pm 12.45$  % respectively.

The "convenience of appointment time" domain items focus on the convenience of clinic location and parking availability. The analysis of this domain scores (table 1) revealed that Me (25%; 75%) indicators in both groups were on 63 (50; 63)% level; average results were  $59.05 \pm 10.93$  % in G+ group and  $59.55 \pm 10.75$  % in G– group. The "cost" domain items focus on the fact that physical therapy expenses are reasonable and patients are ready to pay for physical therapy services. The analysis of this domain scores (table 1) revealed that Me (25%; 75%) indicators in both groups were on 75 (50; 75)% level; average results were  $70.69 \pm 13.96$  % in G+ group and  $70.45 \pm 13.90$  % in G– group.

Billing accuracy (the "billing" domain) in both groups had the highest scores.

The "ease of scheduling an appointment" domain focuses on assessing the convenience of the time, appointed by the institution. The obtained scores of this domain are almost the highest ones. In particular, Me (25%; 75%) indicators in groups G+ and G– comprised 75 (75; 100) %;  $\bar{x} \pm S$  indicators were  $86.64 \pm 12.58$  % and  $85.91 \pm 12.51$  % respectively. A statistical difference between the groups in this domain was not determined ( $p > 0.05$ ).

The next domain of the patient satisfaction questionnaire is "scheduling", which revealed that the first visit to a physical therapist was scheduled quickly and it was easy to schedule the following visits after it. The analysis of this domain scores (table 1) revealed that Me (25%; 75%) indicators in G+ group were on 75 (75; 75)% level, and in G– group – on 75 (50; 75)% level. A statistically significant difference between the groups was determined ( $p < 0.01$ ). Thus, difference between the groups in this domain comprised 8.9%, which entitles us to believe that patients with rational psychotypes were more satisfied with physical therapy classes planning.

The "wait time" domain, which focuses on "when I came for treatment, I was noticed at once", was also significantly better in G+ group ( $p < 0.01$ ). Thus, G+ score was 75 (75; 100)% and G– score was 75 (75; 75)%. Difference between these groups in this domain comprised 6.66%;  $\bar{x} \pm S$  indicators were  $86.21 \pm 12.54$  % and  $68.86 \pm 11.75$  % respectively.

The "courteous staff" and "PT courteous" domains, both focused on grading politeness, had the same Me (25%; 75%) indicators in the groups – 75 (75; 100)%.  $\bar{x} \pm S$  indicators comprised  $86.64 \pm 12.58$  % in G+ group and  $85.00 \pm 12.36$  % in G– group. A statistical difference between the groups in this domain was not determined ( $p > 0.05$ ).

The last domain of the patient satisfaction questionnaire is "overall satisfaction", focused on the fact that a patient recommends the clinic to the family or friends, would visit this clinic if there is a need for physical therapy in future, as well as overall satisfaction with their physical therapy experience. The analysis of this domain scores (table 1) revealed that Me (25%; 75%) indicators in G+ group were on 75 (58.3; 91.7)% level and in G– group – on 58.3 (50; 75)% level. A statistically significant difference between the groups was determined ( $p < 0.01$ ). Thus, difference between these groups in this domain comprised 11.6%, which entitles us to believe that patients with rational psychotypes had better overall satisfaction with physical therapy.

The overall score of the PTPSQ questionnaire, according to the statistical analysis results (table 1), had a significant difference in G+ and G– groups ( $p < 0.01$ ), with  $\bar{x} \pm S$  indicators being on  $76.19 \pm 5.88$  % and  $69.59 \pm 5.69$  % levels respectively. Me (25%; 75%) indicators comprised 76.3 (71.3; 81.3)% and 71.3 (65.0; 73.8)%. Thus, we can assert that according to this questionnaire G+ patients had higher level of satisfaction and gave higher scores for the process and system of physical therapy. Difference between these groups in this domain comprised 6.6%.

To define the impact of modifications in the physical therapy system and the content of the course on a physical therapy satisfaction level, consider statistical analysis results and the comparison of satisfaction scores amongst 2013–2015 and 2016–2018 patients with rational psychotypes (table 2).

In the first domain of the patient satisfaction questionnaire ("treatment"), M+ group had a statistically significant advantage. The analysis of this domain scores (table 2) revealed that Me (25%; 75%) indicators in M+ group were on 85 (80; 90)% level, and in G+ group – on 70 (65; 80)% level ( $p < 0.01$ ). Difference between these groups in this domain comprised 11.62%, which entitles us to believe that 2016–2018 patients with rational psychotypes were more satisfied with the treatment than 2013–2015 patients with rational psychotypes.

The "privacy" domain was not significantly better in any of the groups ( $p > 0.05$ ). Me (25%; 75%) indicators, related to respecting patients' privacy during physical therapy, comprised 75 (75; 75) % in both G+ and M+ groups (table 2). Difference between these groups in this domain was not significant and comprised 2.27%.

The results of the "convenience of appointment time" domain were not statistically different in the groups ( $p > 0.05$ ). Me (25%; 75%) indicators in this domain comprised 63 (50; 63) % in G+ group and 62.5 (50; 75) % in M+ group; average results were  $59.05 \pm 10.93$  % and  $60.74 \pm 11.44$  % respectively. Difference between these groups in this domain was not significant and comprised 1.69%.

Me (25%; 75%) indicators of the "cost" domain comprised 75 (50; 75) % in G+ group and 75 (75; 75) % in M+ group ( $p>0.05$ ). Average results were  $70.69\pm 13.96$  % in G+ group and  $74.12\pm 10.84$  % in M+ group. Difference between these groups in this domain was not significant and comprised 3.43%.

Billing accuracy (the "billing" domain) in both groups had the highest scores.

In the "ease of scheduling an appointment" domain the scores obtained are almost the highest ones. Me (25%; 75%) indicators comprised 75 (75; 100) % in both G+ and M+ groups. A statistical difference between the groups in this domain was not determined ( $p>0.05$ ).

The results of the "scheduling" domain did not have a significant difference between G+ and M+ groups ( $p>0.05$ ). The analysis of this domain scores (table 2) revealed that Me (25%; 75%) indicators in G+ group were on 75 (75; 75)% level and in M+ group – on 75 (50; 87.5)% level.

In the "wait time" domain, which focuses on "when I came for treatment, I was noticed at once", the results were also statistically similar in the groups ( $p>0.05$ ) and comprised 75 (75; 100)%.

The "courteous staff" and "PT courteous" domains, both focused on assessing politeness, had the same Me (25%; 75%) indicators in the groups: 75(75; 100)% in G+ group and 100 (75; 100) % in M+ group. A statistical difference between the groups in this domain was not determined ( $p>0.05$ ).

**Table 2. Indicators of therapeutic alliance evaluation of 2013–2015 patients (G+) and 2016–2018 patients (M+) with rational psychotypes, scores**

Indicators		Groups	
		G+ (n=58)	M+ (n=71)
Treatment	Me(25%;75%)	70(65; 80)	85(80; 90)*
	$\bar{x}\pm S$	$73.45\pm 10.69$	$85.07\pm 7.54$
Privacy	Me(25%;75%)	75(75; 75)	75(75; 75)
	$\bar{x}\pm S$	$74.14\pm 8.06$	$76.41\pm 9.34$
Convenience of appointment time	Me(25%;75%)	63(50; 63)	62,5(50; 75)
	$\bar{x}\pm S$	$59.05\pm 10.93$	$60.74\pm 11.44$
Cost	Me(25%;75%)	75(50; 75)	75(75; 75)
	$\bar{x}\pm S$	$70.69\pm 13.96$	$74.12\pm 10.84$
Billing	Me(25%;75%)	100(100; 100)	100(100; 100)
	$\bar{x}\pm S$	$100.00\pm 0.00$	$100.00\pm 0.00$
Ease of scheduling an appointment	Me(25%;75%)	75(75; 100)	75(75; 100)
	$\bar{x}\pm S$	$86.64\pm 12.58$	$86.97\pm 12.58$
Scheduling	Me(25%;75%)	75(75; 75)	75(75; 87,5)
	$\bar{x}\pm S$	$77.80\pm 12.62$	$78.35\pm 10.97$
Wait time	Me(25%;75%)	75(75; 100)	75(75; 100)
	$\bar{x}\pm S$	$86.21\pm 12.54$	$85.56\pm 12.44$
Courteous staff	Me(25%;75%)	75(75; 100)	100(75; 100)
	$\bar{x}\pm S$	$86.64\pm 12.58$	$88.73\pm 12.53$
PT courteous	Me(25%;75%)	75(75; 100)	100(75; 100)
	$\bar{x}\pm S$	$86.64\pm 12.58$	$89.79\pm 12.38$
Overall satisfaction	Me(25%;75%)	75(58.3; 91,7)	83.3(75; 91.7)*
	$\bar{x}\pm S$	$73.71\pm 15.20$	$82.98\pm 11.57$
PTPSQ	Me(25%;75%)	76.3(71.3; 81.3)	81.6(77.5; 85)
	$\bar{x}\pm S$	$76.19\pm 5.88$	$81.41\pm 4.45$ *

Note. \* – the difference between the indicators of the group is statistically significant  $p<0,01$ .

The last domain of the patient satisfaction questionnaire ("overall satisfaction") had results in favor of M+ group. The analysis of this domain results (table 2) revealed that Me (25%; 75%) indicators in G+ group were on 75 (58.3; 91.7) % level and in M+ group – on 83.3 (75; 91.7) % level. A significant difference between the groups was determined ( $p<0.01$ ). Difference between these groups in this domain comprised 9.27%, which entitles us to believe that 2016–2018 patients with rational psychotypes had better overall satisfaction with physical therapy than 2013–2015 patients with rational psychotypes.

The analysis of a total score of the PTPSQ questionnaire (table 2) showed a significant difference between G+ and M+ groups ( $p<0.01$ ). Thus,  $\bar{x}\pm S$  indicators comprised  $76.19\pm 5.88$  % and  $81.41\pm 4.45$  % respectively, which entitles us to believe that M+ patients who participated in the modified program had higher level of satisfaction and also assessed the process and system of physical therapy better. Difference between these groups in this domain comprised 5.22%.

Consider the results of a statistical analysis of physical therapy satisfaction scores amongst 2013–2015 and 2016–2018 patients with irrational psychotypes (table 3).

The analysis of G– and M– groups results in the first ("treatment") domain confirmed that M– group had a statistically significant advantage. Me (25%; 75%) indicators comprised 80 (75; 85) % in M– group and 60 (50; 75) % in G– group ( $p < 0.01$ ). Difference between these groups in this domain comprised 16.64 %, which entitles us to believe that 2016–2018 patients with irrational psychotypes were more satisfied with the treatment than 2013–2015 patients with irrational psychotypes.

The "privacy" domain was significantly better in M– group ( $p < 0.01$ ). Me (25%; 75%) indicators, which represented the assessment of respect for patients' privacy during physical therapy, comprised 75 (50; 75) % and 75 (75; 75) % in G– and M– groups respectively (table 3).  $\bar{x}$  difference between these groups in this domain was quite big and comprised 8.97 %.

The "convenience of appointment time" domain scores were not significantly different in the groups ( $p > 0.05$ ). Me (25%; 75%) indicators comprised 63 (50; 63) % in G– group and 62.5 (50; 62.5) % in M– group.  $\bar{x}$  difference between these groups in this domain was not significant.

The results of the analysis of the "cost" domain scores did not confirm the score advantage in any of the groups ( $p > 0.05$ ). Me (25%; 75%) indicators comprised 75 (50; 75) % in G– group and 75 (75; 75) % in M– group. The average results comprised  $70.45 \pm 13.90$  % in G– group and  $73.63 \pm 11.38$  % in M– group.  $\bar{x}$  difference between these groups in this domain was not significant and comprised 3.18 %.

**Table 3. Indicators of therapeutic alliance evaluation of 2013–2015 patients (G–) and 2016–2018 patients (M–) with irrational psychotypes, scores**

Indicators		Groups	
		G– (n=55)	M–(n=64)
Treatment	Me(25%;75%)	60(50; 75)	80(75; 80)* #
	$\bar{x} \pm S$	60,55±11,61	77,19±7,81
Privacy	Me(25%;75%)	75(50; 75)	75(75; 75)*
	$\bar{x} \pm S$	69,55±12,45	78,52±8,76
Convenience of appointment time	Me(25%;75%)	63(50; 63)	62,5(50; 62,5)
	$\bar{x} \pm S$	59,55±10,75	60,74±9,41
Cost	Me(25%;75%)	75(50; 75)	75(75; 75)
	$\bar{x} \pm S$	70,45±13,90	73,63±11,38
Billing	Me(25%;75%)	100(100; 100)	100(100; 100)
	$\bar{x} \pm S$	100,00±0,00	99,22±4,38
Ease of scheduling an appointment	Me(25%;75%)	75(75; 100)	75(75; 100)
	$\bar{x} \pm S$	85,91±12,51	85,94±12,5
Scheduling	Me(25%;75%)	75(50; 75)	75(75; 75) #
	$\bar{x} \pm S$	68,86±11,75	71,88±11,14
Wait time	Me(25%;75%)	75(75; 75)	75(75; 75) #
	$\bar{x} \pm S$	79,55±9,73	79,69±9,84
Courteous staff	Me(25%;75%)	75(75; 100)	100(75; 100)
	$\bar{x} \pm S$	85,00±12,36	88,67±12,54
PT courteous	Me(25%;75%)	75(75; 100)	87,5 (75; 100)
	$\bar{x} \pm S$	85,00±12,36	87,5±12,6
Overall satisfaction	Me(25%;75%)	58,3(50; 75)	75 (66,7; 75)* #
	$\bar{x} \pm S$	62,12±10,74	73,05±8,88
PTPSQ	Me(25%;75%)	71,3(65; 73,8)	76,1 (74; 80)* #
	$\bar{x} \pm S$	69,59±5,69	76,86±3,75

Note. \* – the difference between group indicators is statistically significant  $p < 0.01$ .

# – the difference between groups indicators is statistically significant  $p < 0.01$  as compared to M+ group.

Billing accuracy (the "billing" domain) in both groups had the highest scores amongst all domains.

Very high scores in both groups were obtained in the "ease of scheduling an appointment" domain. Me (25%; 75%) indicators comprised 75 (75; 100) % in G– and M– groups. A significant difference between the groups in this domain was not determined ( $p > 0.05$ ).

The "scheduling" domain scores were not significantly different between G– and M– groups ( $p > 0.05$ ). The analysis of this domain scores (table 3) revealed that Me (25%; 75%) indicators were on 75 (50; 75) % level in G– group and on 75 (75; 75) % in M– group.

The results of the "wait time" domain were not significantly different in the groups ( $p > 0.05$ ). Me (25%; 75%) indicators comprised 75 (75; 75) % in both groups.

The "courteous staff" and "PT courteous" domains in G– group had Me (25%; 75%) indicators on 75 (75; 100)% level. M– group had slightly better results (table 3) in the same domains, though no significant differences were determined ( $p>0.05$ ).

The "overall satisfaction" domain had statistically better results in M– group ( $p<0.01$ ). The analysis of this domain scores (table 3) revealed that Me (25%; 75%) indicators in G– group were on 58.3 (50; 75)%, level and in M– group – on 75 (66.7; 75)% level.  $\bar{x}$  difference between these groups in this domain comprised 10.93 %, which entitles us to believe that 2016–2018 patients with irrational psychotypes had better overall satisfaction with physical therapy than 2013–2015 patients with irrational psychotypes.

The analysis of a total score of the PTPSQ questionnaire (Table 3) indicated a significant difference between G– and M– groups ( $p<0.01$ ). Me indicators (25; 75) comprised 71.3 (65; 73.8)% and 76.1 (74; 80)% respectively, which entitles us to believe that M–patients who participated in the modified program had higher satisfaction level and assessed the process and system of physical therapy better.  $\bar{x}$  difference between the groups in this domain comprised 7.27%.

## Discussion

The presented statistical analysis answers the questions of the developed program benefits and changes in physical therapy management and their impact on the level of physical therapy satisfaction amongst the patients grouped according to their psychotypes, though the following issues related to group indicators should be also considered:

- did the results of physical therapy satisfaction amongst 2016–2018 patients with irrational attitude to the disease achieve the results of satisfaction amongst 2013–2015 patients with rational attitude to the disease;
- what items had different scores amongst 2016–2018 patients with irrational attitude to the disease and the patients with rational attitude to the disease;
- are there any differences between the results of comparing G+ with G– groups and M+ with M– groups.

First, it should be noted that when comparing the results of the physical therapy satisfaction questionnaire between G+ and M– groups, we determined two differences in favor of M– group, two differences in favor of G+ group, and two equal indicators, which showed a statistical difference when comparing G+ and G– groups. This confirms better performance of a modified program and methods of managing physical therapy process. We should note that when comparing G+ and M– groups, M– group had an advantage in the "treatment" and "privacy" domains ( $p<0.01$ ). At the same time, this result is the most significant confirmation, since statistical differences between G+ and G– groups (table 1) confirmed only the advantages of G+ group. However, in the "scheduling" ( $p<0.05$ ) and "wait time" ( $p<0.01$ ) domains G+ group had a small but significant advantage over M– group. M–group (with 2016–2018 patients having irrational attitude to the disease) reached the level of G+ group (with 2013–2015 patients having rational attitude to the disease) in the "overall satisfaction" domain and PTPSQ overall score ( $p>0.05$ ), which points out the effectiveness of the implemented changes in the content and management of the physical therapy system.

At the same time, the comparison of the results of M+ and M– groups (table 3) determined a statistical difference in the following domains:

- "treatment" ( $p<0.01$ );
- "privacy" ( $p<0.01$ );
- "scheduling" ( $p<0.05$ );
- "wait time" ( $p<0.01$ ).

It means that the level of physical therapy satisfaction in the modified program also had differences in four items depending on the patients' psychotype.

In order to compare these differences with similar ones in 2013–2015, it is necessary to analyze the results of comparing physical therapy satisfaction in M+ group with M– group (table 3) and G+ group with G– group (table 1). Thus, we determined significant differences in the "treatment", "scheduling", "wait time", "overall satisfaction" domains and PTPSQ score in favor of groups with rational psychotypes in both comparisons ( $p<0.01$ ).

However, we did not determine any significant difference in the "privacy" domain when comparing the results of M+ and M– groups, although it was determined when comparing the results of G+ and G– groups (table 1) and confirmed the advantage of G+ group. Taking into account the results obtained, it can be asserted that the measures taken to improve physical therapy individualization and to enhance patient physical therapy satisfaction were effective amongst 2016–2018 patients with the irrational attitude to the disease and contributed to achieving the results of M+ group in the "privacy" domain.

## Conclusions.

Comparison of the results revealed that the level of physical therapy satisfaction was higher in almost half of the questionnaire domains in groups of the patients with rational psychotypes. The overall satisfaction score also confirmed its higher level in groups of the patients with rational psychotypes. Comparing scores of

physical therapy satisfaction in the groups with similar psychotypes and different physical therapy programs confirmed the advantages of a modified system of physical therapy and of the implemented methods in a number of criteria. At the same time, when comparing the results of 2016–2018 patients having irrational psychotypes with 2013–2015 patients having rational psychotypes, we determined the advantages of M–group in two domains and equalization of scores in two domains, which had a statistical difference when comparing G+ and G– groups. This confirms better performance of modified program methods and measures of physical therapy management.

#### Conflict of interest

The authors state that there is no conflict of interest.

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