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RESEARCH

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Development and evaluation of the musculoskeletal physical therapy registry in Iran: a step toward enhanced evidence-based practice

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Abstract

Introduction Musculoskeletal disorders (MSDs) and injuries are among the leading causes of physical disability and chronic pain worldwide, imposing a significant burden on healthcare systems and economies. Effective management of these conditions relies on evidence-based physical therapy interventions, yet a lack of standardized, high-quality clinical data often limits informed decision-making. Developing a musculoskeletal physical therapy registry enables systematic data collection, assessment of treatment outcomes, and quality improvement in patient care. Therefore, this study aims to develop and evaluate the musculoskeletal physical therapy registry for Iran.

Methods The present study was conducted in Iran from March 2023 to April 2024 in two phases. In the first phase, the RABIT web-based platform was used to create and develop the musculoskeletal physical therapy registry. In the second phase, the registry was evaluated by thirty-eight experts, and the Questionnaire of User Interaction Satisfaction (QUIS) questionnaire was used to assess the system's usability and user satisfaction.

Results After creating and developing a musculoskeletal physical therapy registry in the RABIT web-based platform, the registry was evaluated by thirty-eight experts. The registry achieved an overall average score of 7.39 out of 9, indicating a good level of satisfaction among experts.

Conclusion The musculoskeletal physical therapy registry can help collect and store high-quality administrative and clinical data regarding disorders or conditions, evaluate the effectiveness of physical therapy interventions, and measure and improve patient outcomes. The data collected by the musculoskeletal physical therapy registry can help healthcare providers, managers, and decision-makers evaluate and make decisions related to improving the quality of physical therapy services and, ultimately, individuals' quality of life.

Keywords Development, Evaluation, Physical Therapy, Registry, Iran

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Introduction

Musculoskeletal disorders (MSDs) and injuries are the most common cause of physical disability and severe long-term pain worldwide, with significant socio-economic consequences [1]. In 2020, MSDs were the second-highest-ranked cause of non-fatal disability worldwide [2]. They include more than 150 different conditions affecting joints, muscles, bones, ligaments, tendons, and the spine [2]. MSDs may affect the human body's movement or musculoskeletal functions and typically lead to a decline in an individual's quality of life [3]. The most disabling conditions are back and neck pain, osteoarthritis, rheumatoid arthritis, and fractures [4]. According to the World Health Organization (WHO), musculoskeletal conditions are the leading contributor to disability worldwide, with low back pain being the single leading cause of disability in 160 countries [5]. MSDs affect 1.7 billion people worldwide and can arise from traumatic injury, aging, autoimmune disease, or genetic mutations [6]. According to the prediction of the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD), the number of cases is expected to rise from 494 million in 2020 to 1060 million in 2050, representing a 115% increase [2]. One of the interventions demonstrating potential efficacy in the management of musculoskeletal disorders and improved health-related quality of life (HRQoL) is physical therapy [7, 8]. Physical therapy interventions for musculoskeletal disorders involve a variety of techniques and approaches with the goal of relieving pain and enhancing and reinstating functional outcomes [9].

Collecting and registering high-quality data related to musculoskeletal physical therapy interventions is of immense importance and value, as it enables clinicians to track patient progress, assess treatment effectiveness, and make evidence-based clinical decisions. Furthermore, standardized data collection supports research, facilitates comparisons across different healthcare settings, and enhances the overall quality and efficiency of physical therapy services. Without a well-structured registry, there is a risk of fragmented, inconsistent, and low-quality data, which can hinder patient care and limit advancements in musculoskeletal rehabilitation. One of the information management systems that collects and stores administrative and clinical data regarding a specific patient's condition or disease is the patient registry [10]. The Agency for Healthcare Research and Quality (AHRQ) defines a patient registry as "an organized system that uses observational study methods to collect uniform data (clinical and other) to evaluate specified outcomes for a population defined by a particular disease, condition, or exposure, and that serves one or more predetermined scientific, clinical, or policy purposes" [10].

To date, various physical therapy registries have been created and developed in developed countries worldwide to collect and store high-quality data related to physical therapy services and interventions. These include the Physical Therapy Patient Registry in the USA [11], APTA's Physical Therapy Outcomes Registry in the USA [12], Royal Dutch Society for Physical Therapy registry in the Netherlands [13], Danish Physiotherapy Research Database (PhysDB-FCP) in Denmark [14], Maccabi Physical Therapy Database in Israel [15], and others with different purposes [16–20]. The first physical therapy database, named the Acute Care Physical Therapy Database, was established in the United States in 1986, making it the oldest and first of its kind [21]. Physical therapy registries (databases) could contribute to education, research, assessing the cost-effectiveness of physical therapist interventions, expanding clinical knowledge, documenting practices, informing evidence-based decision-making, developing clinical guidelines, and improving healthcare quality [11–13, 15, 16, 19, 20, 22, 23].

In developing countries such as Iran, the healthcare system encounters a variety of obstacles and challenges, including the widespread use of paper documentation, which leads to inefficiencies in data management; the lack of standard forms at the national level; incomplete or low-quality data recording, which reduces the validity and usability of information; illegible documentation, which complicates data analysis; the absence of standardized registry systems based on a minimum data set approved by experts; and a lack of interoperability and data exchange between information management systems [24–26]. These unique challenges highlight the need for a localized and comprehensive registry system tailored to the Iranian healthcare system, as such a system is currently lacking in the physical therapy domain.

Our study differs from other physical therapy registry systems worldwide by developing a comprehensive national system for managing musculoskeletal physical therapy data. This system is a web-based platform that is incorporated and systematically collects demographic and clinical data, joint and muscle assessments, functional tests, paraclinical evaluations, and outcome measures from patients who attend physical therapy clinics. The ability to electronically and uniformly register physical therapy services is one of the system's most significant features, as it considerably enhances the quality and accuracy of documentation. Moreover, the system contains a graphical management dashboard for data analysis and managerial insights, a feature that is not frequently encountered in numerous comparable systems worldwide. Furthermore, the system is designed to be interoperable and exchange data with other health information management systems, including electronic health records (EHR), facilitating seamless data sharing across various healthcare systems. Another innovative aspect of this study is the post-implementation evaluation of the system's usability using the standard QUIS questionnaire, which has been rarely addressed in similar studies. This registry is web-based and provides nationwide coverage, collecting data on patients who referred to physical therapy clinics across the country. Identifying the burden of musculoskeletal diseases in various regions of Iran and making evidence-based decisions are facilitated by this feature for health policymakers and clinicians. Furthermore, the registry enables the assessment of the performance of physical therapy professionals and the efficacy of physical therapy therapeutic interventions. Its data can be used for the development of physical therapy guidelines, research, and educational purposes. Therefore, the aim of this study was to develop a musculoskeletal physical therapy registry and evaluate the system's usability and users' level of satisfaction in Iran.

Methods

This four-phase methodological study was conducted at the Tehran University of Medical Sciences, Tehran, Iran, from March 2023 until April 2024. The current study concentrated on the third and fourth phases of the development and evaluation of the musculoskeletal physical therapy registry. This study's researchers previously conducted separate studies that addressed the first and second phases [27, 28]. Therefore, this study specifically emphasizes the third and fourth phases. Figure 1 depicts all phases of the project.

First phase: identification of physical therapy registries and similar studies by conducting a systematic review

In the first phase, a systematic review was conducted to identify musculoskeletal physical therapy registries worldwide and to extract their minimum data set (MDS) [27]. We specifically searched the following five electronic databases: PubMed, Web of Science, Scopus, IEEE Xplore, and Google Scholar from their inception until November 1, 2023. In addition, we conducted a gray literature search using the Google search engine in the musculoskeletal physical therapy registry websites (the first seven pages were reviewed) to identify the physical therapy patients' forms for extracted data elements. The keywords related to the minimum data set, registry, and musculoskeletal physical therapy were used for the search. The findings of the first phase have been published previously [27].

Second Phase: determination of the musculoskeletal physical therapy Minimum Data Set (MDS) through the Delphi technique

In this phase, the MDS identified in the first phase was validated by physical therapy experts through the two rounds of the Delphi technique. In each round, the criteria for the acceptance of the data elements were physical therapy experts' levels of agreement. Finally, the MDS for the musculoskeletal physical therapy registry was

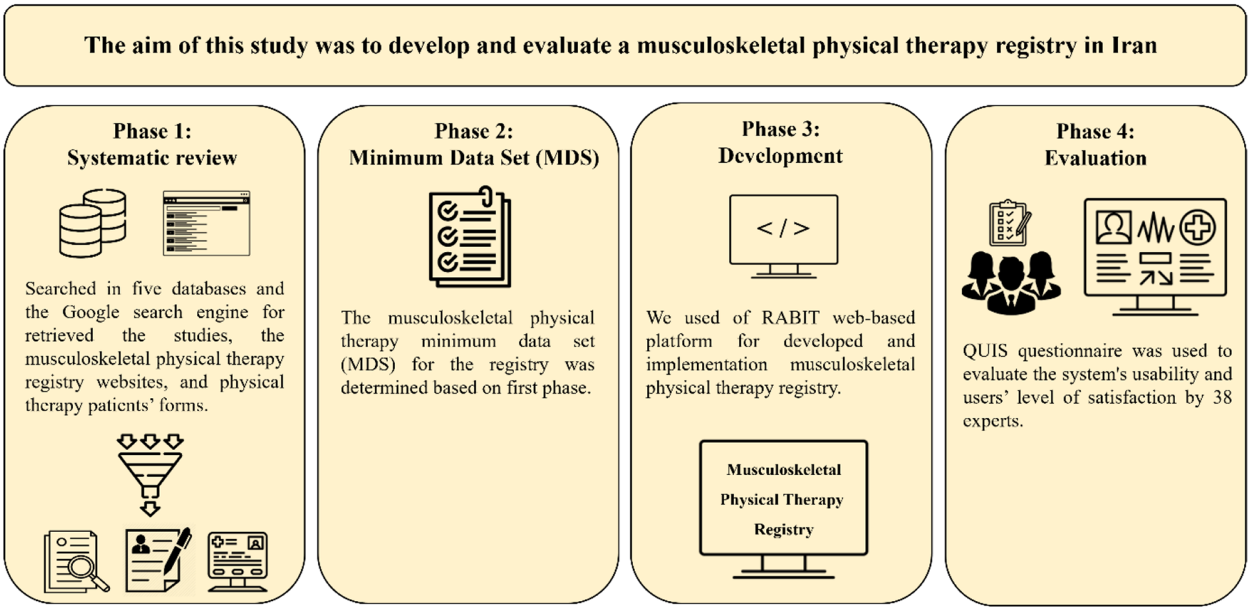


Fig. 1 Phases of the project

determined and divided into administrative and clinical data categories with 42 and 103 elements, respectively. The administrative data contained demographic, healthcare provider, admission, and discharge data, while the clinical data contained general and physical assessment data and outcome measurement tools. A detailed methodology for this Delphi process, including the criteria for data element acceptance, has been published previously [28].

Third phase: development of the musculoskeletal physical therapy registry

In this phase, we used the RABIT web-based platform for the development and implementation of the musculoskeletal physical therapy registry. The RABIT platform is a suite of tools for entering and managing data. It enables the integrated and cost-effective implementation of gathering, analyzing, and visualizing data. The system is equipped with essential features, including data collection, user management with role-based access control, and report generation. Additionally, it provides a graphical management dashboard for data visualization and analysis, enabling better clinical and managerial decision-making. RABIT is a web application platform that is innovative and specifically engineered to facilitate the efficient capture and analysis of data. The architecture of the platform adheres to the principles of REST (Representational State Transfer). Several data security measures have been implemented, including data encryption to ensure confidentiality, role-based access control to regulate user permissions, and user authentication mechanisms to prevent unauthorized access. These measures were designed to safeguard patient information and comply with standard data protection protocols. The system was designed to be highly scalable, allowing for future expansion into other healthcare domains. It can accommodate a growing number of users and large volumes of data while maintaining optimal performance. The form builder tool, a critical part of the platform, is expertly crafted using JavaScript to provide a user-friendly interface. For the frontend development, JavaServer Pages (JSP) are employed to create dynamic and interactive web pages, enhancing the overall user experience. On the backend, the robust Java Spring Framework is utilized to build a reliable and scalable foundation for data processing and management. The analysis subsystem, a key feature of RABIT, is developed using the powerful Python programming language. Flask, a flexible and lightweight web framework, is employed to expose the analysis capabilities. The subsystem leverages various libraries, including Pandas, Scikit-learn, and SciPy, to empower users with advanced data analysis techniques. In summary, RABIT combines the strengths of JavaScript, Java, and Python to create a comprehensive web app platform for seamless data capture, analysis, and visualization [29].

Fourth phase: evaluation of the musculoskeletal physical therapy registry

In this phase, we utilized the Questionnaire for User Interaction Satisfaction (QUIS) to evaluate the system's usability and users' level of satisfaction during its initial implementation phase, which is a critical step toward ensuring user adoption and identifying areas for improvement [30]. The QUIS comprises 30 questions with six categories included: (1) demographic (3 questions), (2) system function (6 questions), (3) display (4 questions), (4) terms and information of the system (6 questions), (5) learning capabilities (6 questions), and (6) general capabilities of the system (5 questions). The questionnaire was based on a 9-point Likert scale, ranging from zero (indicating the lowest level of usability and satisfaction) to nine (indicating the highest level of usability and satisfaction). Four levels were considered to determine the status of each question: a score between 0 to 2 was classified as a weak level, 3 to 5 as a moderate level, 6 to 8 as a good level, and 9 as an excellent level. If the average score of each domain is weak, some items will be redesigned or removed. If the average score is moderate, necessary changes will be made to improve the system's use. If the average score is good or excellent, no changes in that category will be considered. The participants in the evaluation phase were selected using a purposive sampling approach to ensure that experts with relevant backgrounds in physical therapy, health information management, and medical informatics were included. All faculty members of physical therapy ($n=163$), two health information management experts, and one medical informatics expert were invited via email to participate in the study. Inclusion criteria required participants to have at least three years of experience in the field of physical therapy, health information management, or medical informatics, as well as willingness and informed consent to participate in the study. There were no exclusion criteria beyond non-responsiveness. To maximize participation, three follow-up emails were sent over an eight-week period to non-responders. Despite these efforts, the response rate remained limited due to participant availability and willingness. The final sample included 38 experts who completed the QUIS questionnaire, with responses analyzed for usability and satisfaction assessment. The mean, standard deviation, and average score for each question and category were calculated.

Statistical analysis

Data analysis was performed using SPSS v.22 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the data. Since the study primarily focused on the descriptive evaluation of system usability and user satisfaction, no inferential statistical tests were conducted.

Ethical consideration

This study was approved by the Research Ethics Committee of Tehran University of Medical Sciences (IR.TUMS.SPH.REC.1401.261).

Results

First and second phases: identification and determination of Minimum Data Set (MDS) for the musculoskeletal physical therapy registry

The results of these phases were reported in separate previous articles.

Third phase: development of the musculoskeletal physical therapy registry

We used the RABIT web-based platform for developing and implementing the musculoskeletal physical therapy registry. Figures 2, 3 and 4 show the part of the musculoskeletal physical therapy registry (musculoskeletal physical therapy registry address: https://rabit.mums.ac.ir/q/d.ynaoWIQr7.html).

The login page of the musculoskeletal physical therapy registry displays Fig. 2. The access level to administrative and clinical information was established for each user based on their role (administrator, physical therapist, nurse, postgraduate student).

Figure 3 shows the main page of the musculoskeletal physical therapy registry. On this page, administrative and clinical data for each patient are available, and their information can be easily retrieved. The page includes items such as adding a patient, editing requests, my requests, settings, user profile, search box, and patient list. The patient list contains information such as the patient's first and last name, national code, the date of creation, the last modification date, and operations such as new visits and the history of physical therapy interventions, along with the option to edit and delete each electronic record. The musculoskeletal physical therapy registry supports both English and Persian languages.

The four main electronic forms of the musculoskeletal physical therapy registry are shown in Fig. 4. The patient demographic form collected data such as first and last name, national code, date of birth, gender, marital status, educational level, insurance status and type, income level, address, phone number, emergency phone number, occupation status, occupation name, workload, and other information. The clinical form collected data such as the chief complaint, physician diagnosis, physical therapist diagnosis, physical therapy intervention, and other information. The assessment form gathered information on pain location, range of motion (ROM), end feel, joint play, muscle strength testing (MMT), neuromuscular tests, special tests, functional assessment, and other relevant details. The outcomes assessment tools include electronic questionnaires such as the 36-Item Short Form Health Survey (SF-36), Neck Outcome Score (NOOS), Roland Morris Disability Questionnaire (RMDQ), Shoulder Pain and Disability Index (SPADI), Disabilities of the Arm, Shoulder, and Hand Questionnaire (DASH), among others.

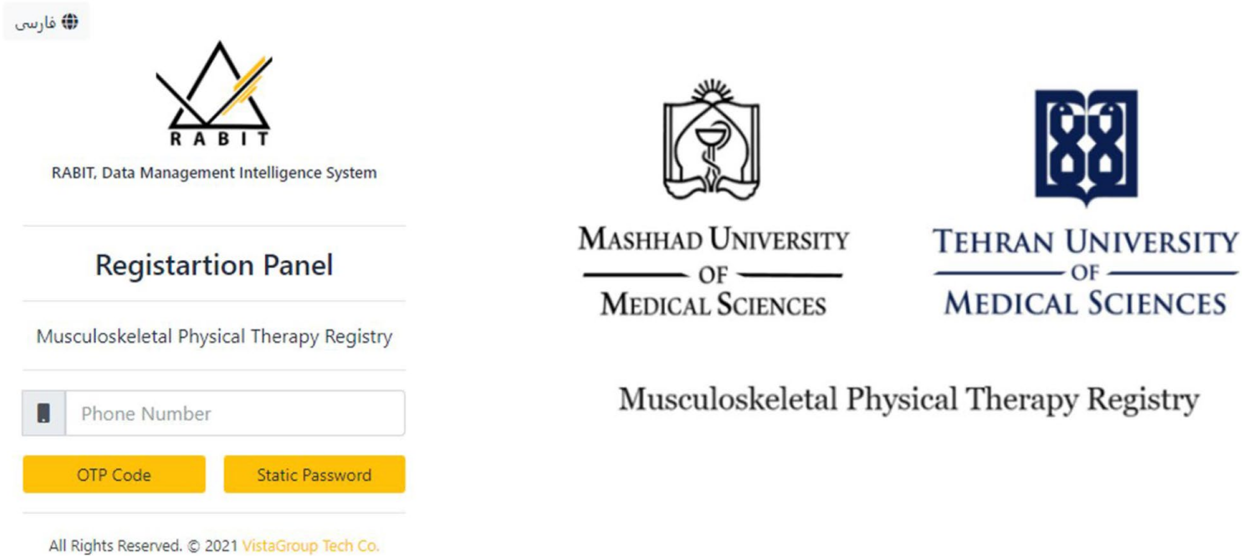
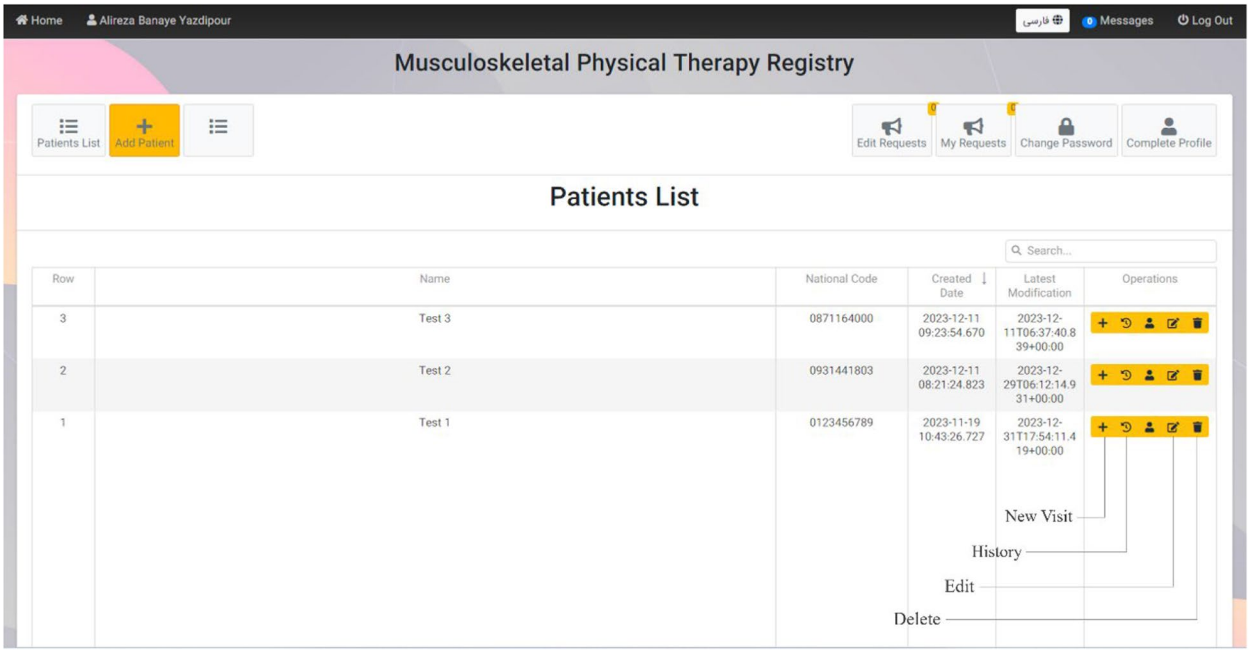


Fig. 2 Login page of the musculoskeletal physical therapy registry



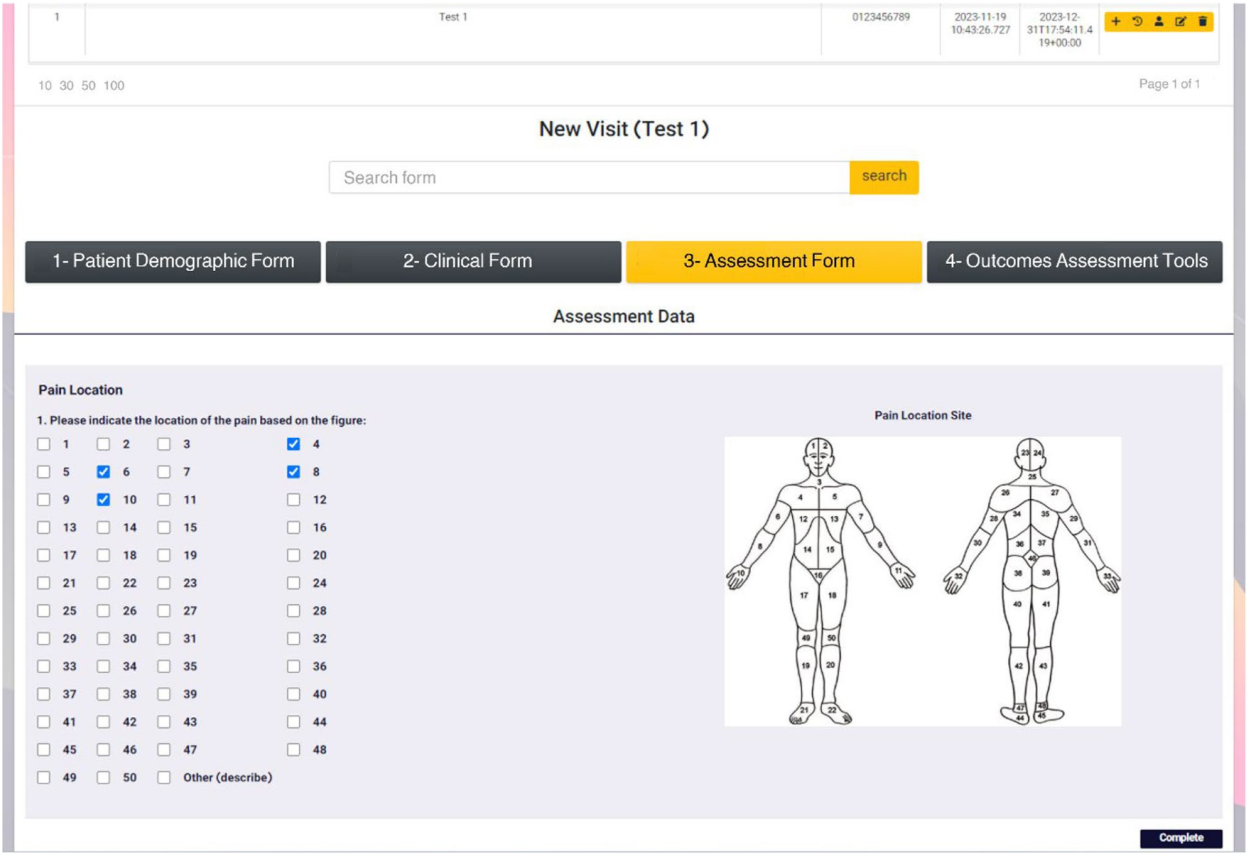
Musculoskeletal Physical Therapy Registry

Patients List

Search...

Row	Name	National Code	Created Date	Latest Modification	Operations
3	Test 3	0871164000	2023-12-11 09:23:54.670	2023-12-11T06:37:40.839+00:00	
2	Test 2	0931441803	2023-12-11 08:21:24.823	2023-12-29T06:12:14.931+00:00	
1	Test 1	0123456789	2023-11-19 10:43:26.727	2023-12-31T17:54:11.419+00:00	

Fig. 3 The main page of the musculoskeletal physical therapy registry



1	Test 1	0123456789	2023-11-19 10:43:26.727	2023-12-31T17:54:11.419+00:00	

New Visit (Test 1)

Search form

Assessment Data

Pain Location

1. Please indicate the location of the pain based on the figure:

☐ 1 ☐ 2 ☐ 3 ☑ 4
☐ 5 ☑ 6 ☐ 7 ☑ 8
☐ 9 ☑ 10 ☐ 11 ☐ 12
☐ 13 ☐ 14 ☐ 15 ☐ 16
☐ 17 ☐ 18 ☐ 19 ☐ 20
☐ 21 ☐ 22 ☐ 23 ☐ 24
☐ 25 ☐ 26 ☐ 27 ☐ 28
☐ 29 ☐ 30 ☐ 31 ☐ 32
☐ 33 ☐ 34 ☐ 35 ☐ 36
☐ 37 ☐ 38 ☐ 39 ☐ 40
☐ 41 ☐ 42 ☐ 43 ☐ 44
☐ 45 ☐ 46 ☐ 47 ☐ 48
☐ 49 ☐ 50 ☐ Other (describe)

Pain Location Site

Fig. 4 The four main electronic forms of the musculoskeletal physical therapy registry

Table 1 Characteristics of experts participating in the evaluation phase

Variable	Mean ± SD	N (%)
Age	45.18 ± 7.68	
Gender		
Male		22 (57.9)
Female		16 (42.1)
Specialty		
Physical therapist (PT)		35 (92.1)
Health Information Management (HIM)		2 (5.3)
Medical Informatics (MI)		1 (2.6)
Work experience	13.10 ± 9.07	
Total number of participants		38 (100)

Fourth phase: evaluation of the musculoskeletal physical therapy registry

The characteristics of the experts who participated in the evaluation phase are shown in Table 1. The mean age of participants was 45.18 ± 7.68 years, and 57.9% of them are men. The majority of experts specialize in physical therapy (*n* = 35, 92.1%), health information management (*n* = 2, 5.3%), and medical informatics (*n* = 1, 2.6%), respectively. The average work experience of participants is 13.10 ± 9.07 years (Table 1).

The results of evaluating the musculoskeletal physical therapy registry based on the QUIS questionnaire are shown in Table 2. According to the data presented in Table 2, the average total evaluation by the evaluators in the various domains is 7.39. Consequently, the evaluators categorized the level of satisfaction and usability of the musculoskeletal physical therapy registry as "good".

The mean scores for the different domains, from highest to lowest, were as follows: display (mean = 7.51 out of 9), learning capabilities (mean = 7.49), terms and information of the system (mean = 7.44), system function (mean = 7.29), and general capabilities of the system (mean = 7.22) (Fig. 5).

Discussion

The development of a musculoskeletal physical therapy registry can improve the collection and documentation of high-quality data regarding patients' disorders or

Table 2 Results of evaluating the musculoskeletal physical therapy registry based on the QUIS

Domain	Sub-domain	Mean	SD	Average scores
System function	General function of the system	7.47	1.63	7.29
	The difficulty of working with the system	7.47	1.51	
	How you feel when using the system	7.36	1.61	
	General system design	7.42	1.30	
	Continuous work with the system	6.84	1.66	
	Registry adjustment capabilities	7.18	1.64	
Display	The readability of the letters on the screen	7.57	1.28	7.51
	Easy performance of tasks using specific phrases	7.42	1.46	
	Organizing information	7.42	1.36	
	Sequence of screens	7.65	1.27	
Terms and information of the system	Using terms in the system	7.26	1.30	7.44
	A set of corrections related to working with the system	7.36	1.17	
	Place messages on the screen	7.55	1.15	
	Message to record essential data	7.60	1.17	
	System message regarding the completion of tasks	7.60	1.17	
	System error message	7.31	1.47	
Learning capabilities	Learn to work with the system	7.76	1.10	7.49
	Discover system features by trial and error	7.50	1.31	
	Preserving names and using capabilities	7.52	1.13	
	Performing tasks quickly and easily	7.39	1.58	
	Help messages in the system	7.26	1.08	
	Guide to using the system	7.52	1.13	
General capabilities of the system	System speed	7.65	1.27	7.22
	System availability	7.34	1.40	
	Number of system capabilities	7.18	1.39	
	Correction of user errors	7.13	1.11	
	Design suitable for different users	6.84	1.56	
Total average				7.39

conditions. It can also help assess the cost-effectiveness of physical therapy interventions, measure and improve patient outcomes, provide education and research, expand clinical knowledge, and facilitate scheduling, real-time patient management, reporting, and the interoperable format for sharing patient data, thus enabling evidence-based decisions. Evaluating the information management systems and registries can determine their strengths and weaknesses, which is very helpful for ensuring the success and continuous use of the system. Therefore, the aim of this study is to develop and evaluate a musculoskeletal physical therapy registry for Iran. The system has been integrated into the daily workflow of physical therapy clinics by supporting patient data management, facilitating documentation of therapeutic interventions, and enabling easy access to patient histories and reports, thereby improving clinical efficiency and evidence-based decision-making. While the current study focuses on both the development of the system and the evaluation of its usability and user satisfaction, future research will focus on assessing the system's impact on patient outcomes by collecting real-world clinical data and evaluating improvements in treatment quality and clinical decision-making.

Various physical therapy registries have been created and developed worldwide such as the Acute Care Physical Therapy Database in the USA [21], the Focus on Therapeutic Outcomes (FOTO) Network in the USA [16], the National Information Service for Allied Health Care (LiPZ) in the Netherlands [20], the Maccabi Physical Therapy Database in Israel [15], the Structured Electronic Physiotherapy Records in Belgium [31], the Physical Therapy Clinical Research Network (PTClinResNet) database in the USA [19], the National Institute of Rheumatology and Physiotherapy Registry in Hungary [22], the Nationwide Physical Therapy Registry (Royal Dutch Society for Physical Therapy registry) in the Netherlands [13], APTA's Physical Therapy Outcomes Registry (PTOR) in the USA [12], the Physical Therapy Patient Registry (ATI Patient Outcomes Registry) in the USA [11], the Physiotherapy Quality Development Database (Danish, named Fysioterapeutisk Kvalitetsudvikling Database (FysDB)) in Denmark [32], and the Danish Physiotherapy Research Database (PhysDB- FCP) in Denmark [14]. Each of these registries is designed and developed for specific purposes and collects detailed data accordingly. The primary objective of physical therapy registries is to gather clinical data on patient functioning and other important measures in order to assess the efficiency, effectiveness, and outcomes of physical therapy treatments. These registries help improve outcomes, support quality reporting requirements, provide a basis for health services research on physical therapy interventions, enhance patient care, inform future payment for services, contribute to the development of evidence-based practices in physical therapy, and facilitate informed clinical decision-making [11, 12, 16]. We developed the musculoskeletal physical therapy registry for Iran based on the above registries. The minimum data set (MDS) for musculoskeletal physical therapy used in this registry has been extracted from these registries and other physical therapy forms. In this registry, we developed four electronic data collection forms that comprehensively capture specific details about each patient. These forms encompassed patient

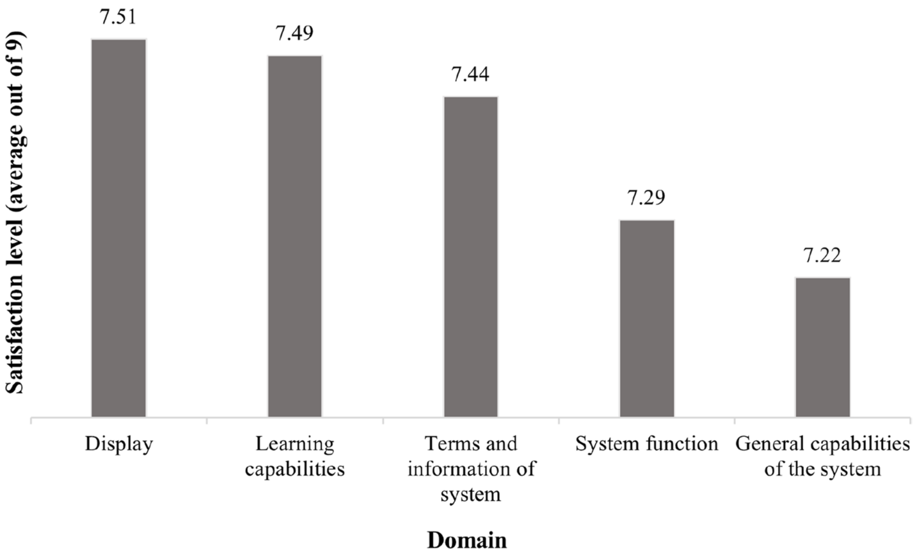


Fig. 5 Evaluating the level of satisfaction and usability across various domains in the musculoskeletal physical therapy registry

demographic data (such as first and last names, national code, date of birth, gender, marital status, educational level, and others), clinical data (such as chief complaint, physician diagnosis, physical therapist diagnosis, physical therapy intervention, and others), assessment data (such as pain location site, range of motion (ROM), end feel, joint play, muscle strength testing (MMT), neuromuscular tests, special tests, and functional assessment), and outcome measurement tools (such as SF-36, NOOS, RMDQ, SPADI, DASH, and others). Our primary goals in developing the musculoskeletal physical therapy registry were to collect and store high-quality administrative and clinical data related to patients, assess the cost-effectiveness of physical therapy treatments, track and improve patient outcomes, provide better care, improve the quality of physical therapy services, guide clinical decision-making, implement musculoskeletal physical therapy guidelines, support research collaborations, and facilitate data exchange with other health information systems.

Evaluating and receiving feedback from end users is crucial following the development and implementation of registries and other information systems to enhance management and quality, reduce costs, and increase efficiency, effectiveness, and user satisfaction [10, 33]. Registries are commonly assessed using quality scales that evaluate elements influencing the registry's ability to achieve its purpose [10]. By conducting thorough evaluations, registries can identify their strengths and weaknesses, ensuring that they continue to produce valuable data for decision-making, research, and quality improvement initiatives [10, 34, 35]. Numerous studies have investigated the evaluation of the information management system (registry) following its design and implementation [36–40]. In this study, after developing the musculoskeletal physical therapy registry, we utilized the QUIS questionnaire to evaluate the registry. The registry achieved an overall average score of 7.39 out of 9, indicating a good level of satisfaction among experts. The results of the evaluation phase were consistent with the results of similar studies [37, 41–43].

One of the key limitations of this study was the relatively small number of participants involved in the evaluation phase of the musculoskeletal physical therapy registry. Despite significant efforts, including sending email invitations and making follow-up phone calls to numerous experts in physical therapy, health information management, and medical informatics, many individuals declined to participate. Consequently, only 38 experts completed the questionnaire, with health information management and medical informatics experts being underrepresented. This limited and imbalanced sample may have affected the generalizability of the results. Moreover, the evaluation relied exclusively on the QUIS questionnaire, which focused on measuring the system's usability and user satisfaction. Although this provided useful insights into the system's early implementation, it did not offer information on its clinical applicability or effectiveness in real-world scenarios. To address these gaps, future research will include prospective studies conducted in real-world clinical environments, with larger and more balanced participant groups, as well as advanced statistical analyses to identify patterns and relationships in user feedback.

Conclusion

The development and initial evaluation of the musculoskeletal physical therapy registry have demonstrated its potential to improve the documentation and management of physical therapy data in clinical settings. By enabling the standardized and electronic collection of high-quality clinical and administrative data, the registry can serve as a valuable tool for clinicians, healthcare managers, and researchers. It facilitates data-driven decision-making, enhances clinical efficiency, and supports the development of evidence-based guidelines in physical therapy. While the current study primarily focused on system development and usability evaluation, future research is essential to assess the registry's impact on patient outcomes, healthcare quality, and cost-effectiveness in real-world clinical settings. Additionally, addressing current limitations, such as low participation rates, through improved engagement strategies and broader participation will be crucial for enhancing the generalizability and robustness of future findings. In summary, this study provides a foundation for the further development and integration of physical therapy registries in healthcare systems. With continued research and refinement, the registry has the potential to contribute significantly to improving physical therapy services, clinical outcomes, and overall healthcare delivery.

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Authors' contributions

All authors have made a substantial, direct, intellectual contribution to this study. ABY, SMA, SNM, LS and KK: study concept and design, data analysis and drafting of the manuscript. ABY, SMA, SNM, LS, and KK: analysis and interpretation of data, critical revision of the manuscript for important intellectual content. ABY, SMA, LS, and KK: critical revision of the manuscript for important intellectual content. All authors provided approval of the final version.

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Data availability
All data generated or analyzed during this study are included in this published article.

Declarations

Ethics approval and consent to participate
Informed consent to participate in the study was obtained from all participants. Ethical approval for this study was obtained from the Research Ethics Committee of Tehran University of Medical Sciences (IR.TUMS.SPH.REC.1401.261).

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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