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The Effectiveness of Student-Driven Pro Bono Physical Therapy Services on Self-Reported Outcomes of Community-Dwelling Adults with Musculoskeletal Conditions

Elise Harris
Franklin Pierce University, harrise@franklinpierce.edu

Tamara Hefferon
Franklin Pierce University, hefferont@franklinpierce.edu

Peyton Oules
Franklin Pierce University, oulesp21@live.franklinpierce.edu

Katherine Sarnacki
Franklin Pierce University, sarnackik21@live.franklinpierce.edu

Benjamin Galaviz
Franklin Pierce University, galavizb21@live.franklinpierce.edu

See next page for additional authors

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Abstract

Purpose: Student-driven pro bono clinics provide a profound clinical education experience for health professional students while serving members of the community. Currently, there is little research on how the pro-bono clinic impacts the community members involved. The purpose of this study was to examine outcomes following discharge from a pro bono clinic held through an entry-level physical therapy program. **Methods:** Forty-one volunteer community members, 19 males (M) (46.3%) and 22 females (F) (53.6%), participated in this study. Ages ranged from 20-90 years, with a mean age of 41(17) years. Each community member completed the Wong-Baker FACES Pain Rating Scale (WBFS), Patient Specific Functional Scale (PSFS), and 36-Item Short Form Health Survey Questionnaire (SF-36) during the initial evaluation and discharge sessions. Community members were seen for 60 minutes once per week for a total of 2-5 visits. Descriptive statistics, Wilcoxon Signed Rank test, and means of the pre-test data and the post-test data were performed. **Results:** Wilcoxon Signed Rank test revealed significance at Z=-4.37, pConclusion: Community members who participated in the student-driven pro bono clinic achieved statistically significant improvement in pain and physical function. In addition to the established benefit of experiential learning received by the student, our study supports a received benefit to the community member.

Author Bio(s)

Elise Harris, PT, DPT, OCS is an Assistant Professor at the Arizona Academic Center, Department of Physical Therapy, Franklin Pierce University.

Tamara Hefferon, PT, DPT, OCS is an Associate Professor at the Arizona Academic Center, Department of Physical Therapy, Franklin Pierce University.

Peyton Oules, SPT is a physical therapy student at the Arizona Academic Center, Department of Physical Therapy, Franklin Pierce University and expected to graduate in October 2023.

Katherine Sarnacki, SPT is a physical therapy student at the Arizona Academic Center, Department of Physical Therapy, Franklin Pierce University and expected to graduate in October 2023.

Benjamin Galaviz, SPT is a physical therapy student at the Arizona Academic Center, Department of Physical Therapy, Franklin Pierce University and expected to graduate in October 2023.

Jake Robert Gaston, SPT is a physical therapy student at the Arizona Academic Center, Department of Physical Therapy, Franklin Pierce University and expected to graduate in October 2023.

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Authors

Elise Harris, Tamara Hefferon, Peyton Oules, Katherine Sarnacki, Benjamin Galaviz, and Jake Robert Gaston

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Elise Harris
Tamara Herreron
Peyton Oules
Katherine Sarnacki
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Jake Robert Gaston

Franklin Pierce University

United States

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Keywords: pro bono, student-driven clinic, musculoskeletal

INTRODUCTION

According to the World Health Organization, approximately 1.71 billion people worldwide suffer from musculoskeletal conditions.[1] The most prevalent among the conditions are low back pain, neck pain, fractures, osteoarthritis, amputation, and rheumatoid arthritis.[1] In the United States (U.S.) alone, an estimated 150 million people were living with musculoskeletal conditions in 2019, and 26.1 million were uninsured.[1] Although the Affordable Care Act (ACA) and the Strengthening Medicaid and Affordable Care Act were established to prevent an increase in the number of uninsured individuals in the U.S, the uninsured rate for nonelderly individuals in 2021 was reported at 10.2%.[2,3] The national average for medical spending in the U.S. was $12,914 per person in the same year, and health care spending specifically related to musculoskeletal disorders was reported at $380.9 billion in 2016.[4,5]

The high cost of medical expenses serves as a barrier for individuals with limited access to health care due to both lack of insurance and low-income.[6] Pro bono healthcare services are avenues to increase accessibility for local communities.[7] These services are defined as work provided voluntarily by a professional with no compensation.[7] Pro bono healthcare clinics are run by licensed clinicians, volunteers, and students at no cost to the community member.[7] As a result, they contribute to a reduction in the financial burden associated with high medical costs.[7]

Physical therapists are considered first-line providers for musculoskeletal conditions in the absence of red flags.[8,9,10,11] When utilized as an initial point of care for management of lower back pain, physical therapy services resulted in significantly lower healthcare costs, prescription opioid use, advanced imaging use, performance of invasive medical procedures, and Emergency Department (E.D.) visits.[9,10,11] Access to physical therapy can therefore decrease medical costs associated with additional diagnostic procedures and medical interventions.[8,9,10,11] However, high out-of-pocket fees, lack of physical therapy providers within communities, and inadequate understanding of services offered are barriers to access.[10] Pro bono physical therapy clinics serve as avenues to overcome barriers to first-line physical therapy care.[8,14,15]

There are over 100 student-driven medical pro bono clinics associated with various entry-level healthcare programs within the United States.[7] Pro-bono clinics within entry-level healthcare programs are utilized to facilitate student learning in preparation for clinical practice.[15] Supervised student-run pro bono clinics provide opportunities to practice clinical judgment, psychosocial skills, and fundamental clinical psychomotor skills.[15] These clinics provide exposure to a variety of diagnoses, including various musculoskeletal and neurological conditions.[1,9,17,18] Patient satisfaction rates are comparable between student-run pro bono clinics and traditional clinics.[19] Community members that volunteer for the pro bono services are often part of the underserved or uninsured.[12,20,21,22] By offering pro bono services, students assist with providing care, improving outcomes like health and well-being, and increasing access to healthcare services within the program's community.[18,21,22]

While there have been many studies assessing the subjective effectiveness of pro bono clinics in terms of overall student and patient perceptions, the current body of evidence lacks the quantitative data to objectively note changes in pain and functional outcomes on the part of the community member.[22] The aim of this study was to investigate the received benefit to the community member to support a dual purpose of a student-driven pro bono musculoskeletal physical therapy clinic as both an avenue to increase accessibility and to facilitate student experiential learning. The hypothesis is that the pro bono physical therapy clinic will lead to quantitative improvements in pain, function, and quality of life.

METHODS

Study Design

The study employed a single-group pre-test and post-test survey design to evaluate improvements in pain, function, and quality of life resulting from an abbreviated physical therapy plan of care. The Institutional Review Board approved the study, and informed consent was obtained from each community member upon enrollment.

Participants

Volunteer community members were recruited using convenience sampling from the surrounding area in Arizona through various methods, including word of mouth, networking on social media, and distribution of flyers to local businesses and community centers. Primary inclusion criteria for participation in the study were age greater than 18 years and a primary musculoskeletal complaint. Community members with acute post-operative, high-risk cardiovascular, pulmonary, neurological, or systemic conditions were excluded from the study. In addition, community members who missed more than one visit or were unable to provide consent due to a language barrier were also excluded.

Outcome Measures

The SF-36 is a widely used self-reported outcome measure for assessing quality of life, and it consists of two summary scores: the Physical Component Summary (PCS) and the Mental Component Summary (MCS).[24] The PCS includes scales of physical

functioning, role physical, bodily pain, and general health, while the MCS includes scales of vitality, social functioning, role emotional, and mental health (Appendix A).[24] Lins and Carvalho, in a scoping review of the SF-36, do not recommend calculating the total/global/overall score; it is encouraged to calculate two summary scores between the physical and mental health categories individually.[24] It is important to note that the Minimal Detectable Change (MDC) values for the PCS and MCS are 3.41 and 3.93 respectively, as determined in patients with lumbar disc herniations.[25] Additionally, the SF-36 has excellent test-retest reliability, with the PCS ICC=0.896 and MCS ICC=0.843.[25]

Intensity of pain was measured by the WBFS, an ordinal measure that uses faces to visually represent various pain levels.[26,27] Each face corresponds to a numerical value ranging from 0-10 in intervals of two that correlates to the current level of pain the reporter feels (Appendix A). There is limited research regarding the validity of the WBFS, possibly due to the lack of standardization in translating the pain experience and individual interpretation of the visual representations attributed to differences in cultural backgrounds.[26] However, Garra et al validated the WBFS by identifying a corresponding mean value of the visual analog scale (VAS) for each face of the WBFS and determined the relationship between the WBFS and VAS. They found excellent agreement between the WBFS and VAS (rho = 0.90; 95% confidence interval [CI] = 0.86 to 0.93), lending support to the validity of the WBFS as an outcome measure for pain.[27]

Physical function was assessed via the PSFS. The PSFS is a valid test that can distinguish change in performance of self-reported activities (Appendix A).[28] The questionnaire quantifies activity limitations and overall function on a 0 to 10 scale (0 represents "unable to perform" and 10 represents "able to perform at prior level").[29] There is excellent test/retest reliability for this tool for patients experiencing activity dysfunction.[29] The MDC is noted on the outcome measure with an average score of 2 points and a single activity score of 3 points.

Procedure

The clinic was offered every year during 2021-2022 spring and summer academic terms, once weekly for a total of 5 weeks per term. Upon enrollment, community members completed a medical history form, the Patient Specific Functional Scale (PSFS), the Wong-Baker FACES Pain Rating Scale (WBFS), and the 36-Item Short Form Survey (SF-36). Community members were seen by small groups of 2-4 student physical therapists under the direct supervision of licensed physical therapists for one-hour sessions. At the first visit, a complete physical therapy evaluation and treatment session was performed, goals were established, and a physical therapy plan of care was recommended based on the evaluation results. Individual goals were established based on the self-reported outcome measures and the objective findings from the evaluation.

Community members were seen once per week for 2-5 weeks, with an overall average of 3 visits. The physical therapy sessions included skilled services that were indicated for the diagnosis, such as manual therapy (e.g., soft tissue mobilization, joint mobilization, manual stretching), appropriate modalities (e.g., dry needling, myofascial cupping), therapeutic exercises, and a home exercise program. Treatment provided depended on both the student's level of training within the academic program and standard of care for the community member's primary physical therapy diagnosis.

The final visit included discharge measurements, extensive self-management education, exercise recommendations, and additional referrals as indicated. Referral sources included local physical therapy clinics, primary care providers, and specialized medical providers. The PSFS, WBFS, and SF-36 were re-administered at discharge to evaluate changes in self-reported outcomes.

Data Analyses and Statistical Tests

Intention to treat analysis was utilized to account for community members who were lost to follow up. Descriptive statistics were performed by calculating the means and standard deviations for both pretest and posttest scores. Wilcoxon Signed Rank test was applied to identify if there were any statistically significant changes in scores from the pretest to posttest (IBM SPSS v28). The level of significance was set at 0.05.

RESULTS

Fifty-two community members enrolled in the study, with 11 lost to follow up. The ages of the 41 community members ranged from 20-90 years of age, consisting of 19 males (M) (46.3%) and 22 females (F) (53.6%). The mean age was 41(17) years, and majority of community members were female and in the 20-30 years age range (46.3%) (Table 1). Table 2 outlines involved body regions and stage of the 41 community members' primary complaint.

Table 1. Demographics of Volunteer Community Members

Age	# Of Community Members	Male	Female
20-30	19	13	5
31-40	4	2	2
41-50	3	1	2
51-60	10	1	10
61-70	3	1	2
71-80	1	0	1
81-90	1	0	1

Table 2. Summary of Conditions by Body Region

Body Region	# Of Community Members	Acute*	Subacute**	Chronic***
Elbow/Wrist//Hand	1			1
Shoulder	5		1	3
Cervical Spine	4		1	4
Thoracic Spine/Ribcage	2			2
Lumbopelvic	9	1	2	6
Hip	4			4
Knee	7	1	1	5
Foot/Ankle	9		2	7

*Acute pain is defined as pain present for 6 weeks or less[30]
**Subacute pain is defined as pain present between 6-12 weeks[30]
***Chronic pain is defined as pain present greater than 12 weeks[30]

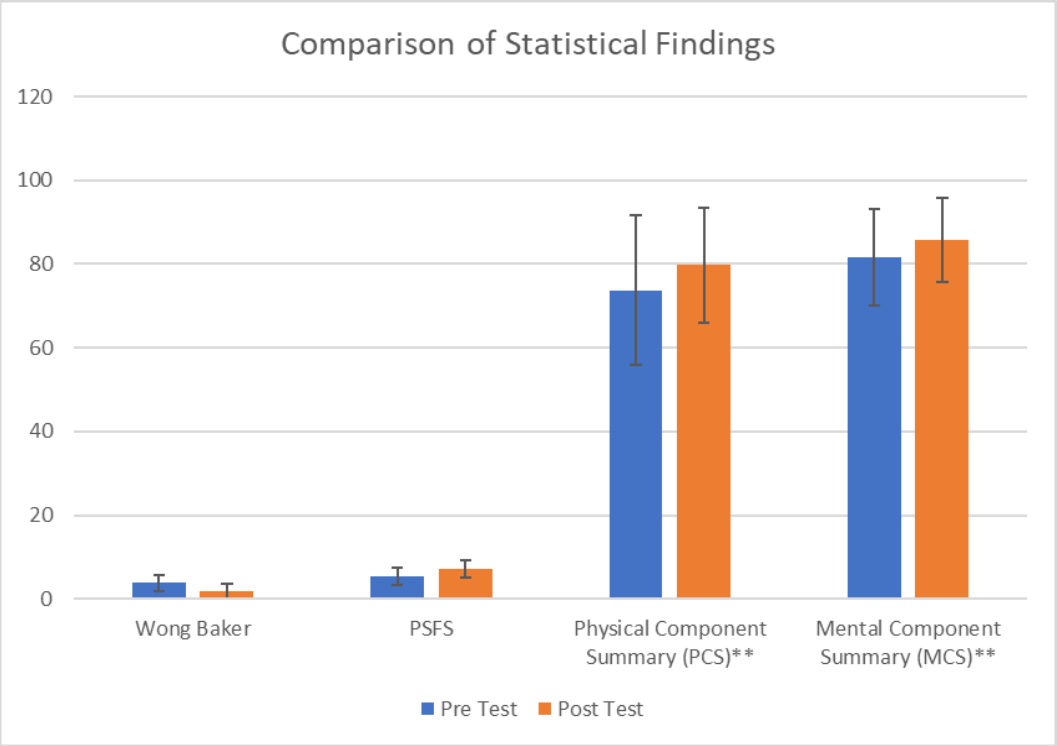
The pre- and post-test intervention means, test statistic, and level of significance of the outcome measures are listed in Table 3. Between pre-test and post-test data, statistical significance was found in the WBFS, PSFS, and the SF-36 as measured by the PCS and MCS subscales (Table 3, Figure 1).

Table 3. Outcome Variables: Pretest and Posttest Means and Findings of Statistical Tests

Variable	Pretest Mean (SD)	Posttest Mean (SD)	Z-Score	p-value (statistical significance)
Wong Baker	3.80 (2.02)	1.90 (1.84)	-4.37	<0.001*
PSFS	5.25 (2.07)	7.16 (2.09)	-5.10	<0.001*
Physical Component Summary (PCS)**	73.65 (17.87)	79.74 (13.66)	-2.6	0.01*
Mental Component Summary (MCS)**	81.55 (11.48)	85.76 (9.97)	-2.07	0.039*

*Statistical significance
**Physical and Mental component summary scores of SF-36 Form

Figure 1 - Comparison of Outcome Measure Statistical Findings: Mean Scores Pre- and Post-test with Standard Deviation



DISCUSSION

Student-driven pro bono clinics serve as a tool for entry-level healthcare educational programs to foster clinical skills in a supervised environment while also nurturing student psychosocial skills of compassion, empathy, and social responsibility. The literature supports received student benefits in these skillsets, however the ethical implications of these clinics must be investigated through analysis of outcome measures to ensure that there is a received benefit for the community member as well.[15,17,18,20] This study aimed to investigate the benefits received by community members who participated in an outpatient student-driven musculoskeletal pro bono physical therapy clinic and the results revealed positive quantitative improvements in pain, function, and quality of life.

Existing literature consistently supports positive outcomes associated with student-driven clinics in various healthcare specialties. Broman et al. conducted an integrative review of 51 articles encompassing multiple dimensions of healthcare, including physical therapy, and reported predominantly positive outcomes related to pain, function, and quality of life.[31] While similarities exist in the self-reported patient outcomes across studies of various specialties, there is limited literature specifically investigating musculoskeletal complaints. The available allied health literature primarily emphasizes positive outcomes within the fields of neurologic occupational and physical therapy. O'Brien et al. conducted a retrospective chart review of 71 patients who attended a student-led neurologic physical therapy clinic to evaluate meaningful functional changes using patient-specific objective outcome measures selected by the students and their supervising physical therapist. The study demonstrated that the student-led clinic effectively facilitated meaningful functional changes for most patients, with the minimum detectable change (MDC) of the objective functional measures achieved in 70% of cases.[32] Doherty et al. conducted a study examining objective functional outcomes, self-reported health, and function in patients with acquired brain injury attending a student-led occupational therapy clinic. Results revealed a large effect size for objective functional outcomes, such as upper extremity function and balance. Self-reported function and health exhibited a medium effect size, indicating moderate improvement.[33] Our study establishes a positive benefit for the community member with a musculoskeletal complaint and adds to the body of evidence in support of student-driven allied health clinic use within the community.

In a qualitative study conducted by Forbes and Nolan, the themes of cost and quality of care were identified as significant factors contributing to community member participation in an abbreviated plan of care at a student-driven physiotherapy clinic in Australia. These themes may provide insights into the factors that influenced both community participation and the measured outcomes of our study.[34] Similar to the findings of Forbes and Nolan, the utilization of our student-driven pro bono physical therapy clinic helped alleviate the financial burden associated with out-of-pocket medical costs for the community members. By offering services at no

cost, we reduced a financial barrier that can hinder individuals from seeking care for their musculoskeletal conditions. This approach facilitated access to consultations, initial management, and additional referrals for further care. Forbes and Nolan also emphasized the importance of interventions focused on self-management, diligent assessment and treatment, and goal achievement in delivering high-quality care.[34] In our study, we adhered to evidence-based standards of care that were specifically tailored to each community member's diagnosis. Furthermore, the presence of direct student supervision played a crucial role in ensuring the provision of high-quality services, education, and ultimately, positive outcomes.

Implementation of student pro bono physical therapy clinics generates broader benefits to the healthcare system. Existing literature has already established the positive impact of physical therapy services in reducing healthcare costs by decreasing the number of medical visits, diagnostic tests, medical procedures, and prescription drug usage.[6,9,10,11] In our study, the population comprised individuals with diverse injuries across different body regions and stages, and they demonstrated positive outcomes after an average of three visits. These findings further support the notion that physical therapy serves as a valuable line of service. The utilization of pro-bono student physical therapy clinics not only decreases the financial burden on individual community members, but also benefits the healthcare system as a whole.

Future research should include larger pro bono clinics with a multidisciplinary approach. Furthermore, incorporating telehealth to pro bono clinics as another option for treatment would help bridge the gap of healthcare accessibility deficits from both a cost and location standpoint. Lastly, a more thorough collection and analysis of basic demographic data such as socioeconomic status, race/ethnicity, outcomes linked to injury stage, and residential geographical region could further help us better understand the correlation between these data points and outcomes in function and pain.

Limitations

The study design has several limitations, including a lack of power analysis, a small sample size, and the absence of a control group. The failure to conduct a power analysis prior to data collection means it is uncertain whether the sample size of community members was sufficient to detect a true treatment effect at the designated level of significance. The internal validity of the study is also compromised by the lack of a control group, which would enable the researchers to determine if the observed positive measured outcomes were a result of the pro bono physical therapy plan of care or external factors.

In addition to the previously mentioned limitations, there were other factors that could have impacted the study's findings. One such limitation was the inconsistent timeline of the plan of care for community members, as the pro-bono clinic was only available during limited time frames throughout the study period. This restricted the availability of community members to attend appointments, resulting in episodes of care that ranged from 2 to 5 visits, with an average of 3 visits. Furthermore, some of the community members had baseline scores that were consistent with the outcome measures' floor and ceiling effects. This meant that some community members presented with very low or very high levels of pain, which could limit the potential for change during the restricted episode of care.

Another limitation of the study was the difference in clinical experience between licensed practitioners and students. Although each student group was supervised by a licensed practitioner, the primary evaluation measures and interventions were primarily administered by students with limited clinical experience. The study did not investigate the consistency in the amount of guidance provided by each licensed practitioner to the student groups. It is therefore uncertain whether some cases received more or less expert input than others. This discrepancy in experience could have affected the quality and consistency of the care provided, which may have influenced the outcomes observed.

CONCLUSION

Despite the limitations mentioned, the study demonstrated positive outcomes from a small sample of community members who participated in a short physical therapy pro bono clinic plan of care. These positive outcomes included a reduction in pain and an increase in the community member's participation in functional activities of daily living and recreational activities. The study's findings aim to encourage the implementation of similar programming in other professional healthcare programs to replicate the same effects and address the needs of underinsured communities. Student-led clinics have the potential to offer valuable experiential learning opportunities for students while also providing measurable positive outcomes for community members, thus serving as a potential solution for addressing the healthcare needs of the school's community.

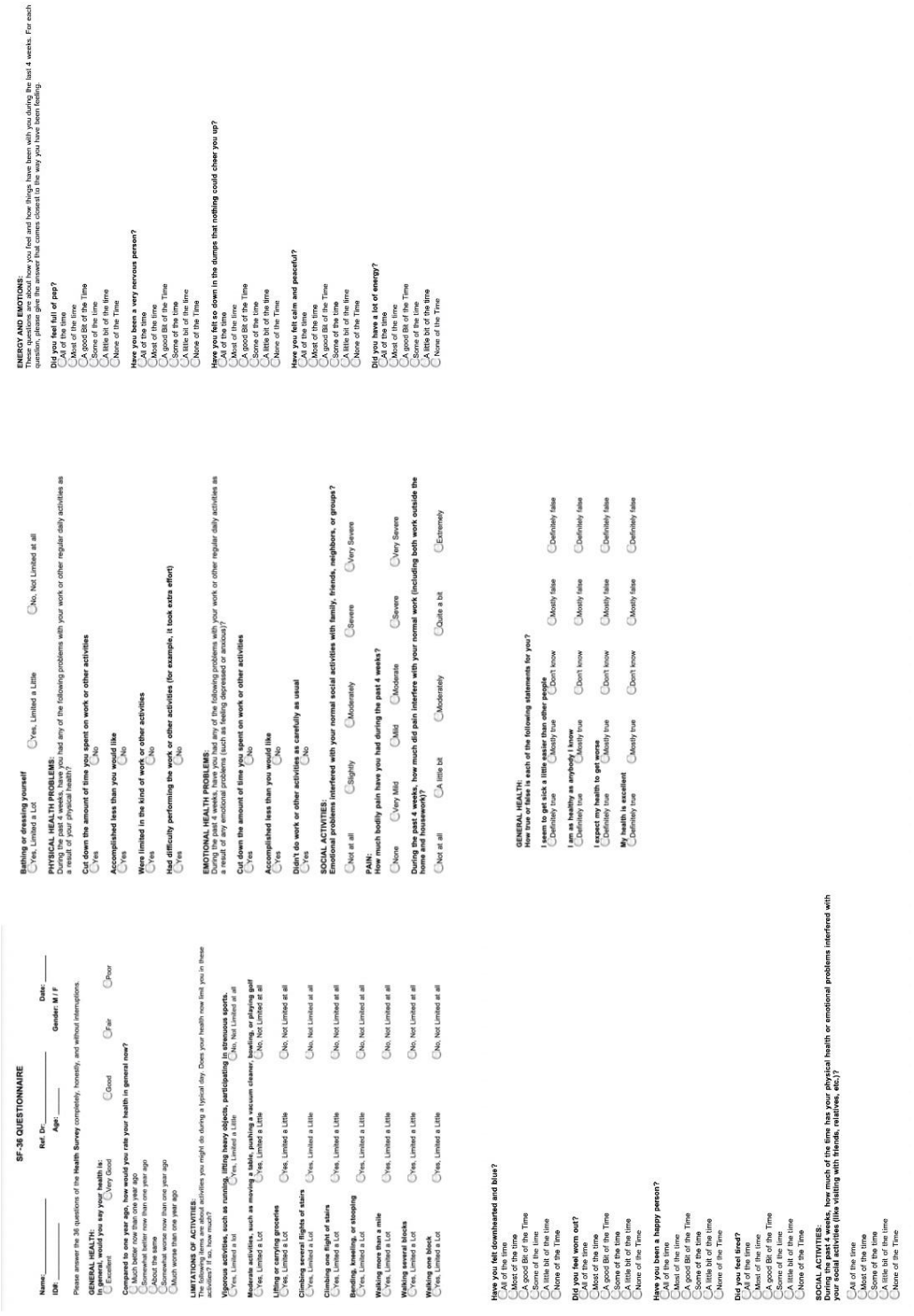
REFERENCES

1. Musculoskeletal health. World Health Organization. Published July 14, 2022. Accessed December 8, 2022. https://www.who.int/news-room/fact-sheets/detail/musculoskeletal-conditions.
2. Cha A, Cohen R. Demographic variation in health insurance coverage: United States, 2020. National Health Statistics Reports . February 2022. doi:10.15620/cdc:121555 [PMID: 35166656]
3. Artiga S, Hill L, Orgera K, Damico A. Health coverage by race and ethnicity, 2010-2019. The Kaiser Commission on Medicaid and the Uninsured.
4. CMS. Historical. CMS. https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/nationalhealthaccountshistorical#:~:text=U.S.%20health%20care%20spending%20grew, For%20additional%20information%2C%20see%20below. Published December 15, 2022. Accessed January 17, 2023.
5. Chen N, Fong DYT, Wong JYH. Health and Economic Outcomes Associated With Musculoskeletal Disorders Attributable to High Body Mass Index in 192 Countries and Territories in 2019. JAMA Netw Open. 2023;6(1):e2250674. doi:10.1001/jamanetworkopen.2022.50674 [PMID: 36662529]
6. Flores AM, Nelson J, Sowles L, Bienenstock K, Blot WJ. Physical impairments and physical therapy services for minority and low-income breast cancer survivors. Springerplus. 2016;5(1):1227. doi:10.1186/s40064-016-2455-3 [PMID: 27536511]
7. Ellett JD, Campbell JA, Gonsalves WC. Patient satisfaction in a student-run free clinic. Fam Med. 2010;42(1):16-18.
8. Hahne AJ, Ford JJ, Surkitt LD, et al. Individualized physical therapy Is cost-effective compared with guideline-based advice for people with low back disorders. Spine (Phila Pa 1976). 2017;42(3):E169-E176. doi:10.1097/BRS.0000000000001734 [PMID: 27306256]
9. Frogner BK, Harwood K, Andrilla CHA, Schwartz M, Pines JM. Physical therapy as the first point of care to treat low back pain: an instrumental variables approach to estimate impact on opioid prescription, health care utilization, and costs. Health Serv Res. 2018;53(6):4629-4646. doi:10.1111/1475-6773.12984 [PMID:29790166]
10. Childs JD, Fritz JM, Wu SS, et al. Implications of early and guideline adherent physical therapy for low back pain on utilization and costs. BMC Health Serv Res. 2015;15:150. doi:10.1186/s12913-015-0830-3 [PMID: 25880890]
11. Fritz JM, Kim M, Magel JS, Asche C v. Cost-effectiveness of primary care management with or without early physical therapy for acute low back pain: economic evaluation of a randomized clinical trial. Spine (Phila Pa 1976). 2017;42(5):285-290. doi:10.1097/BRS.0000000000001729 [PMID: 27270641]
12. Huber GM, Bitzer G, Corazzi C, et al. Access to physical therapy in a medically underserved, urban community. J Health Care Poor Underserved. 2019;30(2):768-788. doi:10.1353/hpu.2019.0055 [PMID: 31130550]
13. Pro Bono Services: Considerations for Physical Therapy Practice. American Physical Therapy Association. Published online August 17, 2020.
14. Pro Bono Physical Therapist Services and Organization Support. American Physical Therapy Association. Published online August 30, 2018.
15. Taylor SJ, Barthel T, Stehouwer J, Stickler L. Students' perceptions of training and experiences with interpreters in a pro bono physical therapy setting. J Interprof Care. Published online May 18, 2021:1-8. doi:10.1080/13561820.2021.1895094 [PMID: 34000947]
16. Frogner BK, Harwood K, Andrilla CHA, Schwartz M, Pines JM. Physical therapy as the first point of care to treat low back pain: an instrumental variables approach to estimate impact on opioid prescription, health care utilization, and costs. Health Serv Res. 2018;53(6):4629-4646. doi:10.1111/1475-6773.12984 [PMID:29790166]
17. Tingey J, Tiano D, Templeton R, Duncan M. Patient, student, and faculty perceptions of a student led pro-bono education and treatment based back school for uninsured Nevadans. UNLV Theses, Dissertations, Professional Papers, and Capstones. Published online 2020:3776.
18. Stickler K, Sabus C, Gustafson H, Kueser M, Lavaveshkul B, Denney L. Pro-bono service through student-run clinics: how does physical therapy measure up? J Allied Health. 2016;45(3):207-211. [PMID: 27585617]
19. Lawrence D, Bryant TK, Nobel TB, Dolansky MA, Singh MK. A comparative evaluation of patient satisfaction outcomes in an interprofessional student-run free clinic. Journal of Interprofessional Care. 2015;29(5):445-450. doi:10.3109/13561820.2015.1010718 [PMID:25700220]
20. Lie DA, Forest CP, Walsh A, Banzali Y, Lohenry K. What and how do students learn in an interprofessional student-run clinic? An educational framework for team-based care. Medical Education Online. 2016;21(1):31900. doi:10.3402/meo.v21.31900 [PMID: 27499364]
21. McAndrew R, Whalley RL, Kaskutas V. Patient and student outcomes of a student experiential learning clinic for hand therapy. Journal of Hand Therapy. 2019;32(4):552-553. doi:10.1016/j.jht.2019.09.013
22. O'Brien SR. Meaningful functional change from physical therapy provided in a student run pro-bono clinic. Archives of Physical Medicine and Rehabilitation. 2015;96(10):e107-e108. doi:10.1016/j.apmr.2015.08.358

23. Morris S, Xia R, Klaassen T, Johnson T. Impact of pro bono clinic on attitudes, beliefs, and confidence towards cultural competence in first-year doctoral physical therapy students. The Internet Journal of Allied Health Sciences and Practice. 2021;19(4).
24. Lins L, Carvalho FM. SF-36 total score as a single measure of health-related quality of life: scoping review. SAGE Open Medicine. 2016;4:205031211667172. doi:10.1177/2050312116671725 [PMID:27757230]
25. Yao M, Xu BP, Li ZJ, et al. A comparison between the low back pain scales for patients with lumbar disc herniation: validity, reliability, and responsiveness. Health Qual Life Outcomes. 2020;18(1):175. Published 2020 Jun 10. doi:10.1186/s12955-020-01403-2 [PMID: 32522196]
26. Adeboye A, Hart R, Senapathi SH, Ali N, Holman L, Thomas HW. Assessment of functional pain score by comparing to traditional pain scores. Cureus. 2021;13(8):e16847. Published 2021 Aug 3. doi:10.7759/cureus.16847 [PMID:34522490]
27. Garra G, Singer AJ, Taira BR, et al. Validation of the Wong-Baker FACES Pain Rating Scale in pediatric emergency department patients. Acad Emerg Med. 2010;17(1):50-54. doi:10.1111/j.1553-2712.2009.00620.x [PMID: 20003121]
28. Hefford C, Abbott JH, Arnold R, Baxter GD. The Patient-Specific Functional Scale: validity, reliability, and responsiveness in patients with upper extremity musculoskeletal problems. Journal of Orthopaedic & Sports Physical Therapy. 2012;42(2):56-65. doi:10.2519/jospt.2012.3953 [PMID:22333510]
29. Shirley Ryan Ability Lab. Patient specific functional scale. Shirley Ryan AbilityLab. https://www.sralab.org/rehabilitation-measures/patient-specific-functional-scale. Published April 13, 2013. Accessed January 17, 2023.
30. King, W. (2013). Acute Pain, Subacute Pain, and Chronic Pain. In: Gebhart, G.F., Schmidt, R.F. (eds) Encyclopedia of Pain. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-28753-4_75.
31. Broman P, Tokolahi E, Wilson OWA, Haggie M, Andersen P, Brownie S. Patient Outcomes from Student-Run Health Services: An Integrative Review. J Multidiscip Healthc. 2022 Mar 30;15:641-665. doi: 10.2147/JMDH.S348411. PMID: 35387392 [PMCID: PMC8979421]
32. O'Brien SR, Bulas M, Metcalfe A, Mix Z, Richert T, Wagner R. Meaningful functional change achieved from physical therapy provided in a student-run pro bono clinic. J Allied Health. 2017;46(3):138-142 [PMID: 28889162]
33. Doherty M, Dyer M, Wilson E, Russell-Thomas D. Rehabilitation Outcomes of an Occupational Therapy Student-Run Free Clinic for Individuals with Acquired Brain Injury. J Allied Health. 2020 Spring;49(1):60-66 [PMID: 32128540]
34. Forbes R, Nolan D. Factors associated with patient-satisfaction in student-led physiotherapy clinics: A qualitative study. Physiotherapy Theory and Practice. 2018;34(9):705-713. doi: 10.1080/09593985.2018.1423592 [PMID: 29308961]
35. Shirley Ryan Ability Lab. Medical outcomes study: SF36. Shirley Ryan AbilityLab. https://www.sralab.org/rehabilitation-measures/medical-outcomes-study-short-form-36. Published September 20, 2015. Accessed June 8, 2023.

APPENDIX A

Figure 2-36-Item Short Form Health Survey Questionnaire (SF-36)[35]



SF-36 QUESTIONNAIRE

Name:_____ Ref. Dr:_____ Date:_____

ID#:_____ Age:_____ Gender: M / F

Please answer the 36 questions of the **Health Survey** completely, honestly, and without interruptions.

GENERAL HEALTH:
In general, would you say your health is:
○Excellent ○Very Good ○Good ○Fair ○Poor

Compared to one year ago, how would you rate your health in general now?
○Much better now than one year ago
○Somewhat better now than one year ago
○About the same
○Somewhat worse now than one year ago
○Much worse than one year ago

LIMITATIONS OF ACTIVITIES:
The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.
○Yes, Limited a lot ○Yes, Limited a little ○No, Not Limited at all

Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf
○Yes, Limited a Lot ○Yes, Limited a Little ○No, Not Limited at all

Lifting or carrying groceries
○Yes, Limited a Lot ○Yes, Limited a Little ○No, Not Limited at all

Climbing several flights of stairs
○Yes, Limited a Lot ○Yes, Limited a Little ○No, Not Limited at all

Climbing one flight of stairs
○Yes, Limited a Lot ○Yes, Limited a Little ○No, Not Limited at all

Bending, kneeling, or stooping
○Yes, Limited a Lot ○Yes, Limited a Little ○No, Not Limited at all

Walking more than a mile
○Yes, Limited a Lot ○Yes, Limited a Little ○No, Not Limited at all

Walking several blocks
○Yes, Limited a Lot ○Yes, Limited a Little ○No, Not Limited at all

Walking one block
○Yes, Limited a Lot ○Yes, Limited a Little ○No, Not Limited at all

Bathing or dressing yourself
○Yes, Limited a Lot ○Yes, Limited a Little ○No, Not Limited at all

PHYSICAL HEALTH PROBLEMS:
During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

Cut down the amount of time you spent on work or other activities
○Yes ○No

Accomplished less than you would like
○Yes ○No

Were limited in the kind of work or other activities
○Yes ○No

Had difficulty performing the work or other activities (for example, it took extra effort)
○Yes ○No

EMOTIONAL HEALTH PROBLEMS:
During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

Cut down the amount of time you spent on work or other activities
○Yes ○No

Accomplished less than you would like
○Yes ○No

Didn't do work or other activities as carefully as usual
○Yes ○No

SOCIAL ACTIVITIES:
Emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?
○Not at all ○Slightly ○Moderately ○Severe ○Very Severe

PAIN:
How much bodily pain have you had during the past 4 weeks?
○None ○Very Mild ○Mild ○Moderate ○Severe ○Very Severe

During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?
○Not at all ○A little bit ○Moderately ○Quite a bit ○Extremely

ENERGY AND EMOTIONS:
These questions are about how you feel and how things have been with you during the last 4 weeks. For each question, please give the answer that comes closest to the way you have been feeling.

Did you feel full of pep?
○All of the time ○Most of the time ○A good Bit of the Time ○Some of the time ○A little bit of the time ○None of the Time

Have you been a very nervous person?
○All of the time ○Most of the time ○A good Bit of the Time ○Some of the time ○A little bit of the time ○None of the Time

Have you felt so down in the dumps that nothing could cheer you up?
○All of the time ○Most of the time ○A good Bit of the Time ○Some of the time ○A little bit of the time ○None of the Time

Have you felt calm and peaceful?
○All of the time ○Most of the time ○A good Bit of the Time ○Some of the time ○A little bit of the time ○None of the Time

Did you have a lot of energy?
○All of the time ○Most of the time ○A good Bit of the Time ○Some of the time ○A little bit of the time ○None of the Time

Have you felt downhearted and blue?
○All of the time ○Most of the time ○A good Bit of the Time ○Some of the time ○A little bit of the time ○None of the Time

Did you feel worn out?
○All of the time ○Most of the time ○A good Bit of the Time ○Some of the time ○A little bit of the time ○None of the Time

Did you feel tired?
○All of the time ○Most of the time ○A good Bit of the Time ○Some of the time ○A little bit of the time ○None of the Time

SOCIAL ACTIVITIES:
During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?
○All of the time ○Most of the time ○Some of the time ○A little bit of the time ○None of the Time

GENERAL HEALTH:
How true or false is each of the following statements for you?

I seem to get sick a little easier than other people	○Definitely true	○Mostly true	○Don't know	○Mostly false	○Definitely false
I am as healthy as anybody I know	○Definitely true	○Mostly true	○Don't know	○Mostly false	○Definitely false
I expect my health to get worse	○Definitely true	○Mostly true	○Don't know	○Mostly false	○Definitely false
My health is excellent	○Definitely true	○Mostly true	○Don't know	○Mostly false	○Definitely false

Figure 3- Wong-Baker FACES Pain Rating Scale (WBFS)

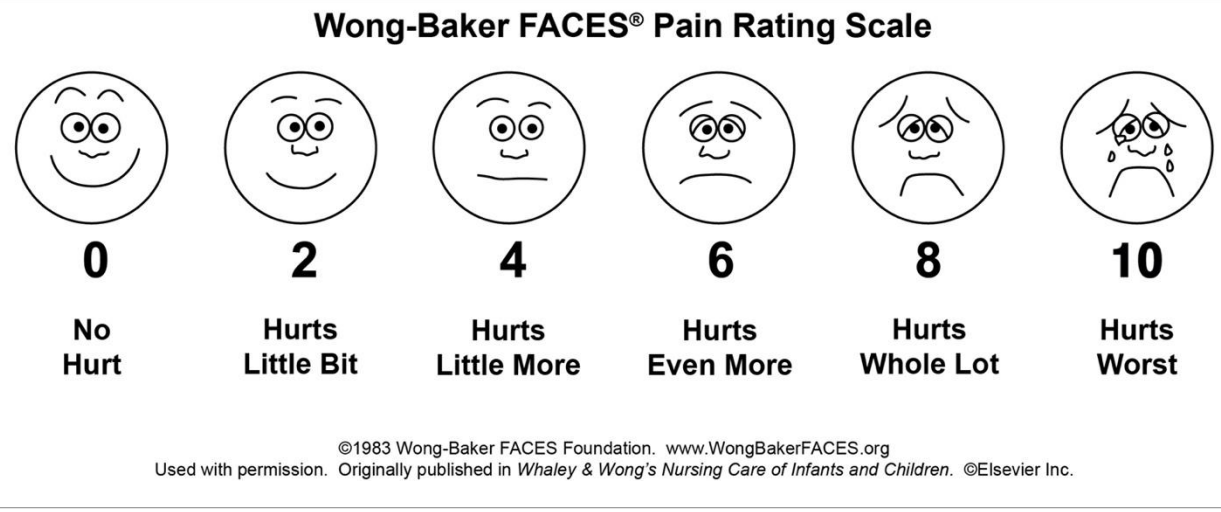


Figure 4- Patient Specific Functional Scale (PSFS)[29]

The Patient-Specific Functional Scale

This useful questionnaire can be used to quantify activity limitation and measure functional outcome for patients with any orthopaedic condition.

Clinician to read and fill in below: Complete at the end of the history and prior to physical examination.

Initial Assessment:

I am going to ask you to identify up to three important activities that you are unable to do or are having difficulty with as a result of your _____ problem. Today, are there any activities that you are unable to do or having difficulty with because of your _____ problem? (Clinician: show scale to patient and have the patient rate each activity).

Follow-up Assessments:

When I assessed you on (state previous assessment date), you told me that you had difficulty with (read all activities from list at a time). Today, do you still have difficulty with: (read and have patient score each item in the list)?

Patient-specific activity scoring scheme (Point to one number):

0 1 2 3 4 5 6 7 8 9 10

Unable to perform activity

Able to perform activity at the same level as before injury or problem

(Date and Score)

Activity	Initial					
1.						
2.						
3.						
4.						
5.						
Additional						
Additional						

Total score = sum of the activity scores/number of activities
Minimum detectable change (90%CI) for average score = 2 points
Minimum detectable change (90%CI) for single activity score = 3 points

PSFS developed by: Stratford, P., Gill, C., Westaway, M., & Binkley, J. (1995). Assessing disability and change on individual patients: a report of a patient specific measure. Physiotherapy Canada, 47, 258-263.

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