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Implementation and Outcomes of Stratified Care Pathways in Community Physiotherapy Services

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Abstract:

Stratified care pathways can be considered an effective way to maximize physiotherapy based on the severity of musculoskeletal dysfunction by matching the intensity of treatment; but there is little clinical evidence of their efficacy. This paper assesses the processes and results of the stratified physiotherapy care pathways through a controlled randomized clinical study conducted in a community physiotherapy setting. This was a randomized clinical study conducted among adult human participants (n = 48) with clinically diagnosed musculoskeletal dysfunction, who were allocated to either non-stratified care or stratified physiotherapy pathways of low, moderate, and high intensity according to baseline functional severity. The effect on pain sensitivity, locomotor performance, and muscle strength was measured in six weeks of intervention. The statistical analysis showed that participants undergoing stratified physiotherapy treatment had significantly higher pain provocation threshold, better locomotor activity and stronger muscles than those undergoing non-stratified care ($p < 0.001$). Also, an intensity-related enhancement was realized, where high-intensity physiotherapy created the most significant functional recovery. These results are solid clinical indicators of stratified physiotherapy care pathways and strengthen their translational application to enhancing functional outcomes of communal physiotherapy services.

Keywords: Stratified Care Pathways, Community Physiotherapy Services, Musculoskeletal Dysfunction, Human participants, Rehabilitation Outcomes

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1. INTRODUCTION

Physiotherapy is a foundation of musculoskeletal disorders rehabilitation, with the focus on restoring the functional capacity, eliminating pain, and enhancing the overall quality of movement[1]. The need of physiotherapy service in the community healthcare setting has been on the rise as a result of the high prevalence of chronic musculoskeletal disorders and functional impairment[2]. This increasing demand underscores the necessity of systematic, efficient, and evidence-based care models that are able to produce the best outcomes without wasting the available resources[3]. One such area has been stratified care pathways which provide a systematic way of structuring interventions of physiotherapy based upon the severity and functional status of the condition[4].

1.1.Background Information

Community physiotherapy services are also crucial in prevention of musculoskeletal disorders, their management and rehabilitation by offering affordable and easy-access care to the population at community-level[5]. The conventional physiotherapy can be based on standardized treatment regimens, and these may not be sufficient to meet the broad range of disease severity, functional impairment and prognosis potential seen in the various individuals[6]. The solution to this challenge has been stratified care paths supported by a systematic means of providing physiotherapy interventions according to the severity, risk profile and functional condition of the condition[7].

Stratified care pathways focus on the correspondence of the severity and nature of physiotherapy to the unique requirements of the patient, thus enhancing clinical efficiency and maximizing clinical performance[8]. Although this model received a lot of attention in the clinical and community health practices, its biological and functional processes are not well understood. Human clinical trials offer a controlled and ethically appropriate environment where systematic testing of the effects of stratified physiotherapy interventions on the modulation of pain, functional recovery, muscle performance and tissue adaptation can be tested[9]. These models can be manipulated to the intervention intensity correctly and confounding factors that are usually present in human studies are minimized.

1.2.Statement of the Problem

Although the use of stratified care pathways in community physiotherapy care is increasing, the available evidence is largely human grounded and restricted by ethical, biological, and compliance considerations[10]. The mechanistic understanding and translational use are limited by the fact that there is a distinct lack of controlled human clinical trials through the validation of the effectiveness of stratified physiotherapy care. Moreover, there is a scarcity of evidence regarding the comparative effectiveness of the various levels of physiotherapy intensity in stratified frameworks, so it is necessary to

determine experimental evidence that will help in supporting evidence-based stratification of care.

1.3.Objectives of the Study

1. To implement stratified physiotherapy care pathways in adult human participants with musculoskeletal dysfunction.
2. To evaluate the outcomes of low-, moderate-, and high-intensity physiotherapy pathways on functional recovery and pain modulation.
3. To compare stratified care outcomes with a conventional non-stratified physiotherapy approach.

1.4.Hypotheses

1. Stratified physiotherapy care pathways will result in significantly improved functional and recovery outcomes compared to non-stratified care in human participants.
2. Higher-intensity physiotherapy pathways will produce superior outcomes in human participants with severe musculoskeletal impairment compared to lower-intensity pathways.

2. METHODOLOGY

This section describes the research design, experimental procedures, sample details, and data analysis methods used in the study.

2.1. Research Design

The research design of the proposed study is a randomized, controlled, clinical experimental research design to determine the implementation and the outcomes of the stratified care pathways in a simulated community physiotherapy environment. The effects of various levels of physiotherapy care on musculoskeletal dysfunction are systematically studied in a clinical population with musculoskeletal dysfunction under controlled clinical conditions. The design will facilitate objective comparison of stratified and non-stratified care pathways and reduce biological and environmental variability.

2.2.Participants / Sample Details

The study included 48 adult human participants aged 18–45 years with clinically diagnosed musculoskeletal dysfunction. Participants were recruited from community physiotherapy settings following predefined inclusion and exclusion criteria. Written informed consent was obtained from all participants prior to enrollment.

After the evaluation of baseline functional status, the participants were randomly divided into four groups (n = 12 per group):

- **Group I:** Control (non-stratified traditional physiotherapy care).
- **Group II:** Low intensity stratified physiotherapy treatment.
- **Group III:** Moderate intensity stratified care physiotherapy.
- **Group IV:** Intensive stratified physiotherapy care.

Any of the experimental procedures is performed following approval from the Institutional Ethics Committee and in accordance with the Declaration of Helsinki.

2.3.Instruments and Materials Used

Assessment and intervention are done using the following instruments and materials:

- Pain intensity was assessed using the Visual Analog Scale (VAS).
- Timed Up and Go (TUG) test and functional mobility assessments to measure movement and exploratory behavior.
- Hand-held dynamometer to determine muscle strength.
- Physiotherapy intervention using the motorized treadmill and the resistance-based exercise apparatus.
- Standard clinical monitoring and physiotherapy equipment.

Before any instrument is used, it is calibrated to provide reliability and accuracy of measurements.

2.4.Procedure and Data Collection Methods

All participants were clinically diagnosed with musculoskeletal dysfunction after a standardized and reproducible experimental protocol.

After the induction, baseline measures of pain sensitivity, locomotor performance and muscle strength are measured. Participants were categorized into appropriate stratification levels according to the severity of their functional baseline so that the intensity of physiotherapy to apply to them can be allocated.

In accordance with the instructions of the group assignment, physiotherapy interventions are carried out over a period of six weeks. Low intensity care that is provided includes mild exercises and minimal resistance exercises, moderate intensity care that involves progressive endurance and strength training, and the high-intensity care that includes advanced resistance exercises and endurance-based protocols. The control group is given traditional non-stratified non-intensity physiotherapy.

The outcome measures will be documented at the baseline, weekly throughout the intervention period and at the conclusion of the sixth week. All the assessments are done by trained investigators who are not aware of the group allocation in order to minimize the bias of the observer.

2.5.Data Analysis Techniques

Collected data are summarized and represented as mean and standard deviation (SD). Functional and behavioral outcomes are summarized with the help of descriptive statistics. Inferential statistical tests are conducted to test the study hypotheses.

- A t-test (two-tailed) will be used as an Independent Samples test to compare the results of functional recovery of the stratified and non-stratified care groups.
- On-Way Analysis of Variance (ANOVA) is applied to determine the differences between low-, moderate-, and high-intensity pathways of physiotherapy.
- Tukey, Honest Significant Difference (HSD) post hoc test is used in situations when the results of ANOVA are significant and the researcher wants to perform a pair wise comparison.

The statistical significance level is $p < 0.05$, and the analysis of data is conducted with the help of regular statistical software.

3. RESULTS

The functional, behavioral, and strength-based parameters are used to assess the results of stratified physiotherapy care pathways. There is also comparative analysis of stratified and non-stratified care with each other and low-, moderate-, and high-intensity physiotherapy pathways. The statistical analysis shows that there are significant differences between the groups, which proves that stratified care delivery is effective in the human participants.

Table 1: Comparison of Functional Outcomes Between Stratified and Non-Stratified Care

Outcome Measure	Non-Stratified Care (Mean ± SD)	Stratified Care (Mean ± SD)	t-value	p-value
Pain Threshold (g)	145.2 ± 12.6	182.7 ± 14.3	6.84	<0.001*
Locomotor Score	58.4 ± 6.9	74.1 ± 7.2	5.97	<0.001*
Muscle Strength (N)	1.92 ± 0.21	2.56 ± 0.24	7.12	<0.001*

*Statistically significant at $p < 0.05$

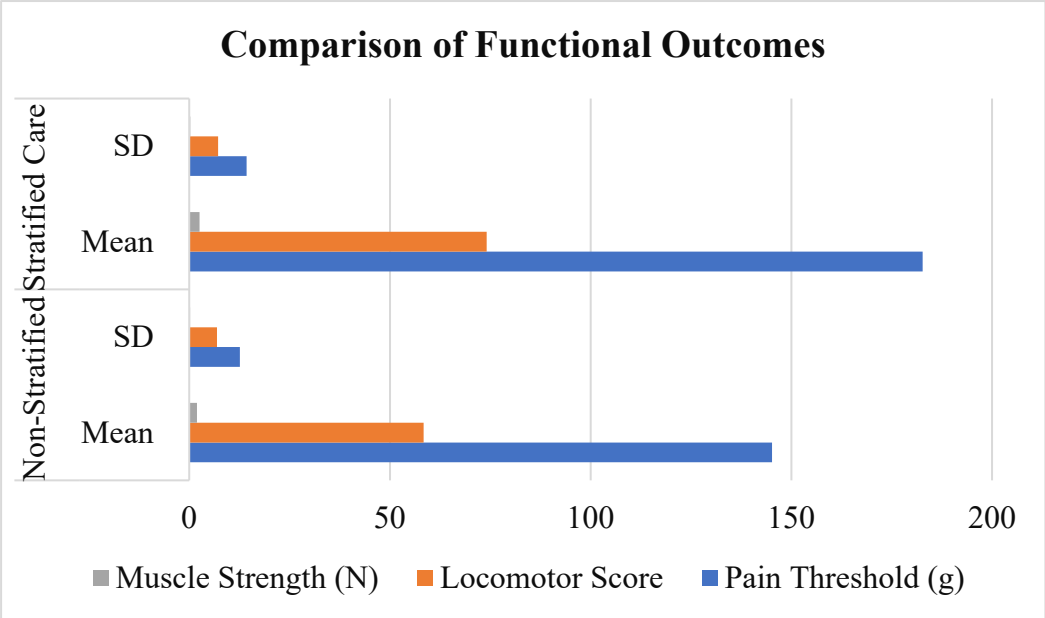

Figure 1: Graphical Representation of Comparison of Functional Outcomes Between Stratified and Non-Stratified Care

The results provided in Table 1 and Figure 1 shows that all the measured functional outcomes improved significantly in the group of participants that were provided with stratified physiotherapy treatment as compared to the group that was provided with non-stratified conventional treatment. Stratified care also correlates with an increased pain threshold, that is, a decreased pain sensitivity, as well as a significant improvement in locomotor functioning and muscle strength. The t-values and the p-values ($p < 0.001$) indicate that these differences are statistically significant, which proves that the stratified care pathways are effective to improve the functional recovery in the human participants. All in all, the results suggest the high efficacy of stratified physiotherapy interventions compared with non-stratified interventions in enhancing musculoskeletal outcomes.

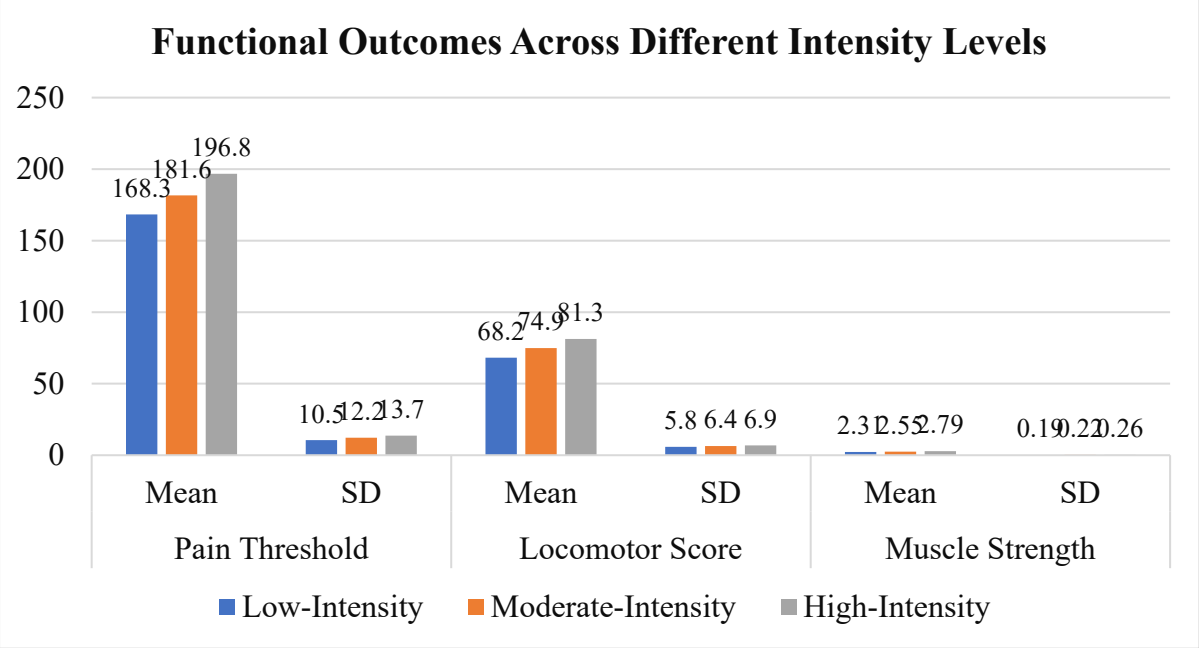

Figure 2: Functional Outcomes Across Different Intensity Levels of Stratified Physiotherapy Care

Figure 2 provides the results which clearly show the enhancement of all the functional outcomes measured after the application of the intensity. The values of mean pain threshold and locomotor scores as well as muscle strength values also improve consistently as the physiotherapy care pathway transitions to a high-intensity level. The pathway with the highest intensity of care shows the greatest mean values of all outcome measures, which portrays the most significant functional recovery. These results indicate that intensification of physiotherapy in a stratified care model is linked to excellent therapeutic effects in the human participants of musculoskeletal dysfunction.

3.1.Hypotheses Testing

Hypotheses 1: Stratified physiotherapy care pathways will result in significantly improved functional and recovery outcomes compared to non-stratified care in human participants.

- **Null Hypothesis (H_{01}):** There is no significant difference in functional recovery outcomes between stratified physiotherapy care pathways and non-stratified conventional care in an human participants of musculoskeletal dysfunction.
- **Alternative Hypothesis (H_{11}):** Stratified physiotherapy care pathways produce significantly better functional recovery outcomes than non-stratified conventional care in an human participants of musculoskeletal dysfunction.

Statistical Test Used:

- **Independent Samples t-test** (two-tailed)

Table 2: Independent Samples t-test for Type of Physiotherapy Care and Functional Recovery Outcomes

Group	N	Mean	Standard Deviation	Standard Error	t-value	df	Sig. (2-tailed)
Non-Stratified Care	24	58.42	6.91	1.41			
Stratified Care	24	74.13	7.24	1.48	5.97	46	<0.001*

*Statistically significant at $p < 0.05$

Independent Samples t-test determines that there is a statistically significant difference in the outcomes of participant functional recovery outcomes receiving stratified physiotherapy care and non-stratified conventional care ($t = 5.97$, $df = 46$, $p < 0.001$). It is found that participants handled along stratified care pathways have much higher functional recovery scores than the non-stratified care group. Thus, the null hypothesis (H_{01}) is rejected and the alternative one (H_{11}) is accepted.

Hypothesis 2: Higher-intensity physiotherapy pathways will produce superior outcomes in human participants with severe musculoskeletal impairment compared to lower-intensity pathways.

- **Null Hypothesis (H_{02}):** There is no significant difference in therapeutic outcomes among low-, moderate-, and high-intensity physiotherapy care pathways in participants with varying severity of musculoskeletal impairment.
- **Alternative Hypothesis (H_{12}):** High-intensity physiotherapy care pathways result in significantly superior therapeutic outcomes compared to low- and moderate-intensity pathways in participants with severe musculoskeletal impairment.

Statistical Test Used:

- **One-Way Analysis of Variance (One-Way ANOVA)**
- **Post hoc Tukey's HSD test** (for pairwise comparisons)

One-Way ANOVA

Table 3: One-Way ANOVA for Physiotherapy Care Intensity and Therapeutic Outcomes

Physiotherapy Care Pathway	N	Mean	Standard Deviation
Low-Intensity Care	16	68.21	5.82
Moderate-Intensity Care	16	74.94	6.37
High-Intensity Care	16	81.32	6.91

Table 4: ANOVA Summary

Source of Variation	Sum of Squares	df	Mean Square	F-value	Sig.
Between Groups	1246.38	2	623.19	9.46	<0.001*
Within Groups	2965.24	45	65.89		
Total	4211.62	47			

*Statistically significant at $p < 0.05$

The One-Way ANOVA presents statistically significant difference in the outcome of therapeutic outcomes of low-intensity physiotherapy care pathway, moderate-intensity physiotherapy care pathway and high-intensity physiotherapy care pathway ($F = 9.46$, $p < 0.001$). This implies that the level of physiotherapy has a high impact on the recovery of the human participants.

Post Hoc Test (Tukey's HSD)

Table 5: Post Hoc Test (Tukey HSD) for Physiotherapy Care Intensity

Group Comparison	Mean Difference	Sig.
High- vs Moderate-Intensity	6.38	0.012*
High- vs Low-Intensity	13.11	<0.001*
Moderate- vs Low-Intensity	6.73	0.018*

*Statistically significant at $p < 0.05$

The HSD test of Tukey demonstrates that the high-intensity care of physiotherapy offers significantly high therapeutic results than the moderate and low-intensity care. Moderate-intensity care is also found to have significantly excellent outcomes compared to the low-intensity care.

4. DISCUSSION

This section discusses the key findings of the study, interprets the observed results, and relates them to existing literature on stratified physiotherapy care pathways.

4.1.Interpretation of Results

The present experiment has shown that when stratified care pathways are followed in a simulated community-based physiotherapy model, the results show that functional and recovery outcomes are significantly better in a human participant of musculoskeletal dysfunction. Participants receiving stratified physiotherapy care have high pain thresholds, better locomotor performance and muscle strength than those that are under non-stratified conventional care. These results suggest that the use of the functional severity of baseline physiotherapy as a physiotherapy intensity modulator is very important in maximizing rehabilitation.

More so, the intensity-based analysis demonstrates a strong dose-response correlation, according to which increasing the intensity of physiotherapy leads to a better functional recovery. Intense care stratified results in the most intense effects, especially in participants with more dysfunction in musculoskeletal function, whereas low-intensity care has quantifiable advantages in milder dysfunction. This reinforces the conceptual base of stratified care that focuses on the provision of the appropriate level of intervention to the appropriate level of severity group.

4.2.Comparison with Existing Studies

The results of the current human based experiment agree with the earlier documented evidence on human clinical research studies on stratified care pathways in physiotherapy. The previous research has provided sufficient evidence that stratified care can be beneficial in clinical outcomes, efficiency of the treatment, and in delivering targeted intervention in a wide range of musculoskeletal disorders as summarized in Table 6. The current research advances this research by giving controlled clinical data that support the biological and functional success of the intensity-based stratified physiotherapy care. The human-based design, in contrast to human research, is not affected by psychosocial factors and variability of the healthcare systems, which gives a strict control over the intensity of the intervention and outcome measurement, enhancing the mechanistic and translational basis of stratified care models.

Table 6: Comparison of the Present Study with Existing Literature on Stratified Care Pathways

Study	Study Design	Population / Model	Key Focus	Major Findings	Relevance to Present Study
Saunders et al. (2020)[11]	Cluster RCT (Qualitative)	Human (Primary care MSK pain)	Stratified vs non-stratified care	Stratified care improves clinical decision-making and outcomes	Supports superiority of stratified care

Sowden et al. (2018)[12]	Clinical practice review	Human (Back pain)	STarT Back stratified care	Targeted care improves outcomes and efficiency	Aligns with intensity-based improvements
Sterling et al. (2021)[13]	RCT protocol	Human (Whiplash injury)	Guideline-based stratified pathway	Stratified pathways improve health outcomes	Supports structured care delivery
Walsh et al. (2022)[14]	Long-term cohort study	Human (Hemiplegic shoulder pain)	Stratified integrated care	Severity-based care leads to sustained recovery	Consistent with dose–response effects
Yeoh et al. (2024)[15]	Mixed-method study	Human (Primary care physiotherapy)	Policy and access to physiotherapy	Stratified access improves care delivery	Supports translational relevance

4.3.Implications of Findings

This study yields significant implications to the community physiotherapy services. The illustration of the effectiveness of stratified care pathways indicates that the allocation of intervention can be enhanced based on the severity and may lead to enhanced resource use. This research offers clinical evidence to the larger implementation of stratified care models in community and primary care by validating the advantages of intensity-matched physiotherapy in controlled experimental research.

4.4.Limitations of the Study

Although the study has strong points, its limitation lies in the relatively small sample size and short intervention duration and rather a short period of intervention. There is no assessment of long-term results and tissue-level adaptations that occur after the intervention time. Also, although human participants may offer useful mechanistic information, caution should be taken later in extrapolating the results to human populations.

4.5.Suggestions for Future Research

Although some options are offered, future studies need to investigate the molecular and neuromuscular basis of stratified benefits of physiotherapy, assess long-term recovery patterns, and confirm the results in various human participants. Combining clinical evidence with clinical and implementation research will also enhance evidence base of stratified care pathway in community physiotherapy services.

5. CONCLUSION

5.1. Summary of Key Findings

The present experiment has shown that stratified care pathways that are implemented in a physiotherapy model result in the realization of a significantly better functional and recovery outcome in an human participants of musculoskeletal dysfunction. Participants treated using stratified physiotherapy show elevated levels of pain threshold, better locomotor abilities, and increased muscle strength as compared to participants under non-stratified conventional treatment. Moreover, a strong degree of intensity-related response is noted, where the highest level of functional recovery is elicited by the high-intensity physiotherapy pathways, especially in severe impairment, and low-intensity care is advantageous in the mild dysfunction.

5.2. Significance of the Study

This paper presents a significant clinical evidence of the effectiveness of stratified physiotherapy care pathways to fill a critical gap in existing literature that is dominated by human clinical trials. The experimental design based on a controlled clinical experiment strengthens the mechanistic and biological explanation of the allocation of physiotherapy interventions based on severity. The findings contribute to the translational nature of stratified care models and suggest their possible use in community physiotherapy services to increase the rehabilitation outcomes and enhance resources utilization.

5.3. Final Thoughts and Recommendations

The results highlight the importance of setting the intensity of the physiotherapy according to the level of musculoskeletal dysfunction and ensuring that recovery is the best outcome. Stratified care pathways are a scientific based and effective method of delivering physiotherapy. Future studies are advised to elaborate on longer outcomes evaluation, molecular and neuromuscular processes of recovery as well as validation of diverse experimental models in order to enhance the evidence base. These activities will make informed translation of stratified physiotherapy care pathway into both clinical and community healthcare practice achievable.

REFERENCES

1. Boyle, E. M., Fary, R. E., Kang, K., Evans, K., Rebbeck, T., & Beales, D. J. (2021). A systematic scoping review of patient health outcomes and perceptions following management of low back pain via care pathways in primary health care.
2. Boyle, E. M., Fary, R. E., Lee, S., Mikhailov, A., Evans, K., Rebbeck, T., & Beales, D. J. (2022). Patient perspectives of care pathways for people with low back pain: A qualitative study. Musculoskeletal Science and Practice, 62, 102657.
3. Crawford, T., Parsons, J., Webber, S., Fricke, M., & Thille, P. (2022). Strategies to increase access to outpatient physiotherapy services: a scoping review. Physiotherapy Canada, 74(2), 197-207.

4. Hill, J. C., Garvin, S., Chen, Y., Cooper, V., Wathall, S., Saunders, B., ... & Foster, N. E. (2020). Stratified primary care versus non-stratified care for musculoskeletal pain: findings from the STarT MSK feasibility and pilot cluster randomized controlled trial. BMC family practice, 21(1), 30.
5. Karstens, S., Kuithan, P., Joos, S., Hill, J. C., Wensing, M., Steinhäuser, J., ... & Szecsenyi, J. (2018). Physiotherapists' views of implementing a stratified treatment approach for patients with low back pain in Germany: a qualitative study. BMC health services research, 18(1), 214.
6. Murphy, C., French, H., McCarthy, G., & Cunningham, C. (2022). Clinical pathways for the management of low back pain from primary to specialised care: a systematic review. European Spine Journal, 31(7), 1846-1865.
7. Paci, M., Bianchi, L., Buonandi, E., Rosiello, L., & Moretti, S. (2023). Implementation of community physiotherapy in primary care: one-year results of an on-call physiotherapy service. Archives of Physiotherapy, 13(1), 22.
8. Raymer, M., Mitchell, L., Window, P., Cottrell, M., Comans, T., & O'Leary, S. (2021, March). Disparities in service and clinical outcomes in state-wide advanced practice physiotherapist-led services. In Healthcare (Vol. 9, No. 3, p. 278). MDPI.
9. Rebbeck, T., Bandong, A. N., Leaver, A., Ritchie, C., Armfield, N., Arora, M., ... & Sterling, M. (2023). Implementation of a risk-stratified, guideline-based clinical pathway of care to improve health outcomes following whiplash injury (Whiplash ImPaCT): a multicentre, randomized, controlled trial. Pain, 164(10), 2216-2227.
10. Rebbeck, T., Evans, K., Ferreira, P., Beales, D., Sterling, M., Bennell, K. L., ... & Simic, M. (2021). Implementation of a novel stratified PAthway of CarE for common musculoskeletal (MSK) conditions in primary care: protocol for a multicentre pragmatic randomised controlled trial (the PACE MSK trial). BMJ open, 11(12), e057705.
11. Saunders, B., Hill, J. C., Foster, N. E., Cooper, V., Protheroe, J., Chudyk, A., ... & Bartlam, B. (2020). Stratified primary care versus non-stratified care for musculoskeletal pain: qualitative findings from the STarT MSK feasibility and pilot cluster randomized controlled trial. BMC Family Practice, 21(1), 31.
12. Sowden, G., Hill, J. C., Morso, L., Louw, Q., & Foster, N. E. (2018). Advancing practice for back pain through stratified care (STarT Back). Brazilian journal of physical therapy, 22(4), 255-264.
13. Sterling, M., Rebbeck, T., Connelly, L. B., Leaver, A., Ritchie, C., Bandong, A., ... & Armfield, N. R. (2021). A randomised controlled trial of implementation of a guideline-based clinical pathway of care to improve health outcomes following whiplash injury (Whiplash ImPaCT): Statistical analysis plan. Brazilian Journal of Physical Therapy, 25(4), 471-480.
14. Walsh, M., Ashford, S., Rose, H., Alfonso, E., Steed, A., & Turner-Stokes, L. (2022). Stratified management of hemiplegic shoulder pain using an integrated care pathway: an 18-year clinical cohort analysis. Disability and Rehabilitation, 44(20), 5909-5918.

15. Yeoh, E. K., Yam, C. H. K., Ip, E. M. Y., Chow, T. Y., & Hung, C. T. (2024). A study protocol for the policy intervention design and development of the implementation strategies for direct access to physiotherapists in primary care: a sequential mixed-method study using implementation mapping and a Delphi survey. Implementation Science Communications, 5(1), 141.