

A Retrospective Evaluation of a Knee Rehabilitation Class Following Evidence-based Modifications

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Abstract

Knee pain is a common musculoskeletal disorder and contributes a large socio-economic burden to health systems around the world. The traditional strategy to manage knee pain has been exercise. However, there is growing recognition to include coping and self-management educational strategies to improve psychosocial outcomes. **Purpose:** The purpose of this evaluation was to compare the effectiveness of a revised knee rehabilitation class that incorporated an evidence-based educational component (2021–2022) to the previous knee rehabilitation class that did not incorporate an evidence-based educational component (2020–2021) by comparing pre-class and post-class outcome measurement scores. **Methods:** A retrospective evaluation of the knee rehabilitation classes at an NHS Trust in North London, United Kingdom was conducted using the knee injury and osteoarthritis outcome score (KOOS) and lower extremity functional scale (LEFS) from two cohorts of participants from 2020–2021 to 2021–2022. Data from the two classes were analyzed separately and then compared. Satisfaction scores were captured using a questionnaire which participants completed at the end of each class. Data were analyzed using the Statistical Software for Excel package. **Results:** A total of 46 and 52 patients attended the 2020–2021 and 2021–2022 classes, respectively. Both classes showed significant improvements in KOOS and LEFS when analyzed separately, but no significant difference when compared. The 2020–2021 class had a mean satisfaction score of 87.2%, and the 2021–2022 class had a mean satisfaction score of 91.7%. **Conclusion:** The addition of an evidence-based educational component incorporating coping and self-management strategies in a knee rehabilitation class showed improvement in outcome measurement scores but cannot be considered superior to a class which consisted of an exercise component only.

Keywords: Knee, Rehabilitation, Class, Evaluation, Evidence-based

1. Introduction

Knee pain is a common musculoskeletal disorder and contributes a large socio-economic burden to health systems around the world¹. The costs associated with knee pain are estimated to be over \$300 million per year². The incidence of knee pain ranges between 10% and 60% and approximately 2% of people consult their general practitioner every year for knee pain³. The pain and functional limitations associated with knee pain can significantly impact work, sport, and activities of daily living and about 50% of people report persistent pain after

12 months^{4,5}. Anterior knee pain (AKP) is an umbrella term used to describe pain and loss of function of the knee, often during knee flexion⁶. Many people report a feeling of instability or “giving way” of the knee; however, this is more due to a neuromuscular inhibition as opposed to an internal injury of the knee⁷. People with AKP demonstrate successful outcomes to an exercise-based approach when compared to surgical interventions with improvements noted in a reduction of pain symptoms and function in the moderate to long-term⁸. People with knee pain are commonly referred to physiotherapy and following an initial assessment with a physiotherapist are allocated to a

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group rehabilitation class. A systematic review has shown that group rehabilitation classes can provide physical, psychosocial, and cost-effective benefits⁹. However, despite the evidence demonstrating the benefits of group rehabilitation classes in treating knee pain, there is a lack of evidence into whether the inclusion of an evidence-based educational component will promote coping and self-management strategies within a group environment. The purpose of this evaluation was to compare the effectiveness of a revised knee rehabilitation class that incorporated an evidence-based educational component (2021–22) to the previous knee rehabilitation class that did not incorporate an evidence-based educational component (2020–2021) by comparing pre-class and post-class outcome measurement scores. The specific objectives of this evaluation are:

- To evaluate the efficacy of the 2020–2021 class
- To evaluate the efficacy of the 2021–2022 class
- To compare the efficacy of the revised 2021–2022 class and the 2020–2021 class
- To evaluate the patient satisfaction scores of both classes.

2. Materials and Methods

A retrospective evaluation of the knee rehabilitation classes at an NHS Trust in North London, United Kingdom, began in April 2022 from two cohorts of participants from 2020–2021 to 2021–2022 using outcome measurement data collected previously by the physiotherapist leading the classes. The outcome measurements used were the knee injury and osteoarthritis outcome score (KOOS) which is a self-reported outcome measure assessing the patient's opinion about the health, symptoms and functionality of their knee¹⁰, and the lower extremity functional scale (LEFS) which is a patient-rated outcome measure of the lower extremity function¹¹. Both outcome measurements are validated and reliable^{10,11}. Pre- and post-class scores were collected by the lead physiotherapist, as well as demographic data such as age, gender, and diagnosis for both the 2020–2021 and 2021–2022 classes. All patients were also required to complete a satisfaction questionnaire at the end of the 8-week knee rehabilitation class. In the 2020–2021 cohorts, all patients that presented with AKP were allocated by the lead physiotherapist to an 8-week knee rehabilitation class. This class consisted of an exercise component only which included range of motion,

proprioception and strength training. Similarly, for the 2021–2022 cohort all patients that presented with AKP were allocated by the lead physiotherapist to an 8-week knee rehabilitation class. However, this class consisted of two components: An evidence-based educational seminar incorporating coping and self-management strategies, and an exercise component which included range of motion, proprioception and strength training. Data were analyzed using the Statistical Software for Excel package. The data within the class were analyzed using a two-tailed paired t-test and between classes were analyzed using an independent t-test. The level of statistical significance was considered at $P < 0.05$. This project was classified as a service improvement evaluation because the data collected was part of routine clinical practice and therefore ethical approval was not required.

3. Results

A total of 46 patients completed the 2020–2021 class and 52 patients completed the 2021–2022 class. Tables 1 and 2 depict the demographic data of the respective classes.

3.1. Objective 1: Evaluation of the efficacy of the 2020–2021 class

There was a significant increase in KOOS scores from 49 (pre-class) to 62 (post-class) representing a mean

Table 1. Demographic data of the 2020–2021 knee rehabilitation class

Variables	n=46
Male/female/unknown (n)	31/12/3
Age (mean years)	57
Diagnosis - Anterior pain (%)	100

Table 2. Demographic data of the 2021–2022 knee rehabilitation class

Variables	n=52
Male/female/unknown (n)	37/11/4
Age (mean years)	59
Diagnosis - Anterior pain (%)	100

change of 13 ($P = 0.001$). Similarly, there was a significant improvement in LEFS disability scores from 37 (pre-class) to 52 (post-class) representing a mean change of 15 ($P = 0.001$).

3.2. Objective 2: Evaluation of the efficacy of the 2021-2022 class

There was a significant increase in KOOS scores from 51 (pre-class) to 66 (post-class) representing a mean change of 15 ($P = 0.001$). Similarly, there was a significant improvement in LEFS disability scores from 39 (pre-class) to 51 (post-class) representing a mean change of 12 ($P = 0.001$).

3.3. Objective 3: Comparison of the efficacy of the revised 2021-2022 class and the 2020-2021 class

There was no significant difference between the pre- and post-KOOS scores when comparing the revised 2021–2022 class and the 2020–2021 class ($P = 0.335$). Similarly, there was no significant difference between the pre- and post-LEFS disability scores when comparing the revised 2021–2022 class and the 2020–2021 class ($P = 0.498$).

3.4. Objective 4: Evaluation of the patient satisfaction scores of both classes

In the 2020–21 class, the mean satisfaction score was 87.2%, and for the 2021–2022 class the mean satisfaction score was 91.7%.

4. Discussion

The first objective of this evaluation was to evaluate the efficacy of the 2020–2021 class. The KOOS and LEFS scores were taken before and after the 8-week class. The 2020–2021 class showed significant improvements in both outcome measurement scores. The second objective of this evaluation was to evaluate the efficacy of the 2021–2022 class. The KOOS and LEFS scores were taken before and after the 8-week class. The 2021–2022 class also showed significant improvements in both outcome measurement scores. These findings were similar to Batterson and colleagues¹² who reported similar improvements in

knee pain following a 6-week rehabilitation class. The significance of the study by Batterson *et al.*¹² was that it demonstrated the beneficial effects of strength exercises on the knee. The impact of loaded exercises was also demonstrated in an earlier study by Hurley *et al.*¹³.

The third objective of this evaluation was to compare the efficacy of the revised 2021–2022 class and the 2020–2021 class to determine whether the evidence-based educational seminar incorporating coping and self-management strategies led to significant improvements. Although each individual class led to significant improvements in outcome measurement scores, there was no significant improvement between the 2020–2021 class and the 2021–2022 class. It can, therefore, be concluded that neither class can be considered superior and that the addition of an educational component to the exercise component did not lead to any greater benefit to pain, disability, and function for patients presenting with AKP. As demonstrated in earlier studies,^{12,13} improvements were likely due to the strengthening and loading exercises and not to the educational component.

The patient satisfaction scores were high for both groups. It can be concluded that in addition to both classes facilitating improvements in outcome measurement scores and coping and self-management strategies, patients also felt that the classes offered a supportive and collaborative environment which motivated them to complete their rehabilitation. Patients with knee pain are often grouped together in an exercise class following an initial assessment with the physiotherapist and the satisfaction scores in this evaluation are consistent with previous studies^{14,15}. The strength of this evaluation was the inclusion of strength and loading exercises as part of the classes which is supported by the literature for its beneficial effects. This evaluation is limited because the data was collected at only one clinical site which limits generalizability.

5. Conclusion

This evaluation compared the effectiveness of a revised knee rehabilitation class that incorporated an evidence-based educational component to an earlier knee rehabilitation class that did not incorporate an evidence-based educational component. The evaluation showed that although the knee rehabilitation class which included an evidence-based educational component

led to improvements in outcome measurement scores, this was similar to the improvements shown by the earlier knee rehabilitation class. Therefore, both knee rehabilitation classes were equally effective in improving outcome measurement scores and coping and self-management strategies. It is recommended that future evaluations consider data collection from multiple sites and to follow-up patient outcome measurement scores in the longer term, for example, 3, 6, and/or 12 months post discharge.

6. References

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