

Verification of subgroups in patellofemoral pain.

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Background:

Patellofemoral pain is diagnosed when people exhibit pain around their patella during squatting or other functional tests in a flexed position, such as going down stairs. In addition, other conditions, which can produce the same symptoms, should be excluded (Willy et al 2019). Patellofemoral pain is not a self-limiting condition (Rathleff et al 2016), with more than half of patients still having pain years after their diagnosis (Rathleff et al 2013, Laprade and Culham 2002). Therefore, the international patellofemoral research retreats, a regular meeting of internationally recognised experts in patellofemoral pain, have made subgrouping of people with patellofemoral pain a priority (Witvrouw et al 2014). The idea behind subgrouping is that the identified subgroups could receive more targeted care and therefore produce better outcomes. Previous research suggested that three potential subgroups exist in the patellofemoral pain (PFP) population: strong, weak & tighter and weak & pronated foot, which could enhance outcomes after treatment (Selfe et al 2016). However, this study was conducted in a UK population and the findings are not generalisable for other populations.

Aims:

- 1) to verify the three subgroups in a new Turkish cohort
- 2) to develop an App which could be used for verifying subgroups

Methods:

The first study was a descriptive, cohort study in a Turkish population (Yosmaoğlu et al 2020). Patients with PFP were assessed using six clinical tests. Muscle strength was measured with a hand held dynamometer of the quadriceps and abductor muscles. Muscle tightness was with standardised tests of the gastrocnemius, hamstrings and rectus femoris muscles. Patellar mobility was measured using the patellar glide test and foot pronation was measured with the Foot posture Index (Redmond et al 2006). These outcome measures were analysed using hierarchical cluster analysis (HCA) and compared to results from Selfe et al 2016.

For the second aim an App, Apatella, was developed during a collaborative process between three UK Universities. It was identified that the App needed to serve three usergroups: 1) the patients, 2) the clinicians, and 3) the researchers. In the first phase, multidisciplinary meetings, including clinicians, researchers and software engineers, were scheduled to explore the needs of each usergroup. In the next phase a prototype of the App was developed.

Results:

For the first aim, three patellofemoral subgroups, which mapped onto the previously identified subgroups, were found in the Turkish sample. However, there were differences in mean scores and frequencies between the two populations.

The second aim resulted in a prototype of the app being developed which could serve the three identified users of the App. Generally, the app could be downloaded from the google play store.

Patient needs were identified as data protection of their (personal) data and information about their prescribed exercises. Patients could choose if they wanted to share their information with others (clinicians or researchers), without repercussions of the service. Then a QR code was provided to start the prescribed exercises. For each exercise a video and text were available.

Clinicians needs were identified as ease to subgroup people with patellofemoral pain into the relevant subgroup and the use of outcome measures. A comprehensive assessment for subgrouping was included in the app. When clinicians completed these assessments, the data was uploaded to a secure server and the subgroup was calculated. The clinician would then be presented with the specific subgroup for that patient in the App. Outcome measures, such as the visual analogue scale and the Patellofemoral pain subscale of the KOOS (KOOS-PF) (Crossley et al 2018) were also included in the App.

Researchers needs were identified as accessibility to the consented data for subgrouping. Data could be made accessible by logging into a secure server. Only consented data was accessible.

Conclusion:

Our work verified the presence of three PFP subgroups in one other country, however cut-off thresholds required for subgrouping in different populations may differ. More data about patellofemoral outcome measures and treatment sessions is needed. The developed App (Appatella) could capture these in clinical settings. However further testing of the app and its requirements for implementation in clinical settings is recommended in smaller groups.

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