Titelblad

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Ved at underskrive dette dokument bekræfter hvert enkelt gruppemedlem, at alle har deltaget lige i projektarbejdet og at alle således hæfter kollektivt for rapportens indhold.

Prologue

This study aims to be published in "*Health Expectations; an international journal of public participation in healthcare and health policy*". The article therefore follows their author guidelines, which is further described in the theoretical appendix. This article uses the American Medical Association (AMA) style as a means of referencing in accordance with the journal's guidelines.

References to the empirical material is referred to as (P:Søren, 459-672), where P indicates a reference to a physiotherapist. Adolescents will be referred to as (A: Mads, 234-456). References to the group conversations during the workshop is made as (Appendix 1 or 2)

Declaration of interest

This research has no funding or commercial associations or interests which pose a conflict of interest.

Abstract

Aim: To develop and test the applicability of design thinking in including adolescents together with physiotherapists in the creation of a model for rehabilitation of non-traumatic musculoskeletal knee pain (MSKP)?

Background: A new approach towards rehabilitation is warranted, since adolescents afflicted with MSKP show low adherence to rehabilitation. A multitude of factors influence adherence which lead to successful rehabilitation, and a need to accommodate these arises. This can only be accomplished by including adolescents, since they must be viewed as the experts concerning their lives and preferences. Using workshops based in design thinking appears promising in including patient groups along with experts, which therefore could help create rehabilitations tailored towards adolescents preferences. No studies have yet examined how (or whether) workshops based in design thinking may contribute to including adolescents together with physiotherapists in rehabilitation of MSKP.

Method: A Future Workshop was developed to include adolescents along with physiotherapists in creating a new approach to rehabilitation of MSKP. The participants were 3 adolescents aged 14-19 with MSKP and at least half a year of experience with rehabilitation and 3 physiotherapists with 2 or more years of experience in treating adolescents. The workshop was observed and conversations between the adolescents and physiotherapists were recorded. Afterwards semi-structured interviews were conducted with all participants, and the emperical material was coded through a thematic analysis.

Results: The analysis showed that a number of difficulties are present when attempting to facilitate collaboration between adolescents and adult health professionals. Differences in authority, based in distinct ages and experiences, create situations where the adolescents can be excluded by the adult participants. However, techniques following with the future workshop as a design choice seems to possibly include the adolescents in actively participating as decision makers.

Conclusion: Designing a workshop to ensure inclusion of adolescents in creation of new rehabilitation models is difficult, but the design choice of a future workshop seems to possibly help facilitate inclusion of adolescents in collaborations with adult physiotherapists. However parts of the design need to be considered in an attempt to limit differences in authority between adolescents and adults.

Keywords: Musculoskeletal pain, Adolescents, Inclusion, Participation, Future Workshop.

Introduction

Non-traumatic musculoskeletal knee pain (MSKP) is a condition that more than 30% of 10-19 years old experience during adolescence [1–4]. Exercise therapy is recommended to combat MSKP long term [5]. However, current management strategies using exercise therapy do not show promising results, as adolescents' adherence to rehabilitation is low [6–8]. This leads to limited effect from exercise therapy, since greater adherence is linked to more successful rehabilitation [7]. The pain therefore continues and limits adolescents' options for participating/returning to sport, which affects their well-being [9]. This showcases the need for a solution where we can create rehabilitation that ensures high adherence for adolescents and thereby ensures a continuation of their physical activities in daily lives.

Therefore new approaches to rehabilitation of adolescents with MSKP is warranted, with a focus on increased inclusion of the adolescents' perspectives since greater involvement has been shown to increase motivation [10], and could hereby entail improved adherence to rehabilitation. New studies have shown that MSKP is affected by a multitude of bio-psycho-social factors and these need to be considered for a successful rehabilitation. [11–14]. Adolescents should therefore be included in rehabilitation to a greater degree, since it cannot be expected that all factors shown to influence rehabilitation otherwise are accounted for, and adherence will continue to be low. This shows the need to include adolescents in the creation of a new model for rehabilitation to tailor this to adolescents needs. It must therefore be considered how to include the adolescents' perspectives in the creation of their rehabilitation.

Recent research has started to include patient groups in the creation of treatments, often through workshops, which allows for dialogue between patient and healthcare professionals [15–17]. Through such methods, adolescents and physiotherapists could create a common understanding of adolescents' needs during rehabilitation and help tailor rehabilitation to adolescents. We, therefore, want to examine how such workshops should be designed with a focus on how adolescents experience participation in creating future rehabilitation models together with physiotherapists and if they are actively included in that proces. Therefore, the aim of this article is to develop and test the applicability of design thinking in including adolescents together with physiotherapists in the creation of a model for rehabilitation of MSKP.

State of the art

Before examining how to include adolescents with MSKP in the design of future rehabilitation models, the current state of knowledge in the field is needed. We conducted an initial systematic literature search (Appendix 11), which led to five relevant articles. The first focused on current barriers in treating musculoskeletal pain (MSP) for adolescents, and saw adherence as the barrier [6]. The second showed a need for a bio-psycho-social model (BPSM) [11]. The third advocates for a multidisciplinary approach towards MSP resembling BPSM, might be beneficial and involvements of physiotherapist, occupational therapist and psychologist could improve rehabilitation for adolescents [18]. The fourth was centered around adolescents' experiences of MSP, and created a model, which was tested on adolescents. They concluded that research needs to create reflection among physiotherapists when creating interventions [19]. The fifth was focused on experiences of adolescents with MSP and interviewed adolescents following a consultation with physiotherapists. Focus was the adolescents' ability to communicate preferences concerning treatments. This highlighted difficulties communicating, and options were given to how adolescents also could communicate [20]. None of the studies however attempted to include adolescents in the creation of new models for rehabilitation. Our study attempts to cross this gap, and include the adolescent in treatments from the start of the process within a workshop.

Theoretical framework

To answer if adolescents are included in the creation of new models for rehabilitation a theory describing exclusion mechanisms within workshops is chosen. This allows for analysis of inclusion within workshops. Furthermore, a theory describing the interplay between adolescents and adults is represented in Hart's ladder of participation, which describes adolescents' inclusion alongside adults.

Exclusion Mechanisms

A study investigating exclusion mechanisms and inclusion strategies in patient experts partnership [17] identified three mechanisms for exclusion within a workshop (Theoretical appendix). These were: 1. The workshop setting (setting), which can be caused by the choice of location, time and duration of the dialogue, 2. What is done (behavior), where exclusion

occurs based on participants being given less speaking time, ignored or dominated in conversation and 3. What is said (verbal), where use of jargon or academic language which participants are unable to follow can lead to exclusion. Through the use of this theory, we will be able to identify if and how exclusion happens within the workshop, and how this limits the adolescents' inclusion. However, this theory only highlights if adolescents are excluded, and does not examine how adolescents participate and interact with adults. Therefore Hart's ladder of participation is included.

Hart's ladder of participation

Hart's ladder of child participation consists of 8 rungs representing varying degrees of ascending participation and shared decision-making agency [21].

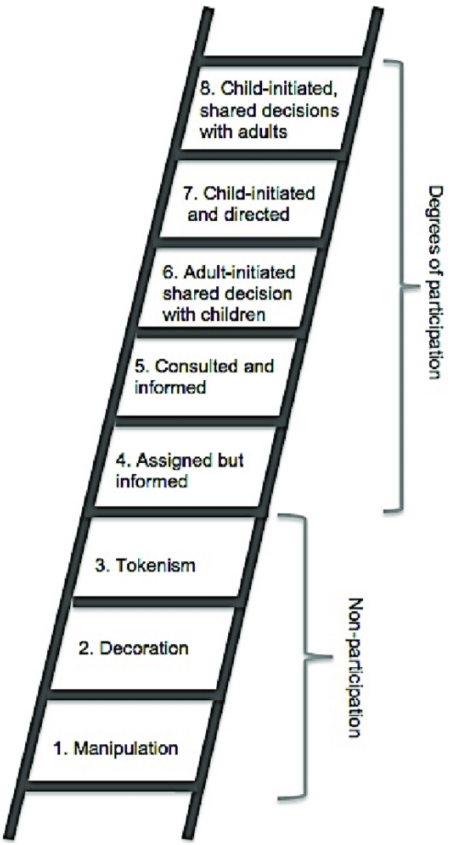

Figure 1: *Eight levels of youth participation* [21].

Hart determines rung 1-3 as non-participatory and 4-8 as participatory, but with the youth agency being higher at rung 8 compared to 4 (Theoretical appendix). Higher rungs of participation are not always better, since the adolescents' capacity to participate varies [21]. We will only focus on the rungs four and upwards since this workshop is thought to fulfill the

requirements of Hart's fourth ladder, and therefore the adolescents are seen as participatory (Theoretical appendix). We see participation as inclusion, with a higher degree of participation seen as an expression of greater inclusion.

This study hereby integrates Hart's ladder with mechanisms for exclusion within a workshop. This is done since even if the adolescents are participatory, their degree of participation can shift and some exclusion mechanism might still occur. Both theories are therefore needed to answer if adolescents can be included within workshops and if they can be included together with physiotherapists in the creation of new rehabilitation models.

Method

Design

To secure inclusion of adolescents in the creation of future models for rehabilitation, we need to consider which methods are suitable. One method is future workshop (FW), which previously has been shown beneficial when facilitating democratic decision-making processes between groups within society [22]. Furthermore, the FW has also been shown suitable for facilitating collaborations with adults and adolescents [23].

Future Workshop

FW as a method focuses on 5 distinct phases, which are explained chronologically [22]. 1. The preparation phase, where themes, participants' and methods are handled by the facilitators. 2. The critique phase, where the theme of FW is critically investigated, and a problem is collectively identified by the participants. 3. The fantasy phase, where participants work towards a utopia of the commonly identified problem. Afterwards, the most promising ideas are reduced to their most realistic form. 4. The implementation phase, where ideas are evaluated in regards to practicability, and implementation. 5. the follow-up-phase, where the workshop is evaluated.

Future workshop for adolescents

FW requires a high amount of engagement and creativity of its participants. Creativity calls for competences outside what might normally be thought to differentiate adults and

adolescents, since it allows participants to participate without having extensive skills in vocabulary, writing, argumentation or knowledge. Adolescents might therefore find participation easier in FW, since the differences in skills between adult and adolescent might be somewhat negated and hereby facilitate greater inclusion [23,24]. FW in its essence is designed to enhance democratic processes and the method was created to include marginalized groups [22]. This could help include adolescents, since their voice has not yet been represented clearly in the context of MSKP. FW might therefore act as a mediator for barriers shown when including adolescents together with adults [25].

Participants

The participants in the FW directed towards creating new rehabilitation models for adolescents with MSKP were: Three adolescents aged 14-19 with previous experiences of MSKP and rehabilitation, as well as three adult physiotherapists with experience with treating adolescents with MSKP. These were recruited through previous research and social media.

Table 1: Information on the adolescent.

Name	**Age**	**Number of years with knee pain**	**Recruitment**
Mads	19	4	Previous research
Marie	15	5	Previous research
Anna	14	2	Social media

Table 2: Information on physiotherapist

Name	**Years of physio-experience**	**Recruitment**
Helle	12	Social media
Søren	10	Social media
Jens	5	Social media

Strategies for limiting exclusion

A number of strategies were implemented before and during the workshop to limit exclusion, and prevent barriers in collaborations between adults and adolescents [25]. These strategies illustrate how our FW differentiates itself from previous research in FW for children and adolescents, and hereby provides new insight. The different strategies used are explained in

table 3, in accordance with the three different mechanisms for exclusion. This is further elaborated in the theoretical appendix.

Table 3: Applied strategies for limiting exclusion.

Category	Possible exclusion mechanism	Applied inclusion strategies
Setting	Uncomfortable location for Patients. Experts outnumber patients. Unfamiliar with workshop methods.	Neutral location at Aalborg University. Equal number of adolescents and physiotherapist participating in the workshop. Describing the process of the workshop, and the purpose of it as well as having a mental preparation for each phase.
Behavior	No opportunities for patients to speak. Creation of groups. Uncomfortable behavior from experts.	The participants were divided into two groups consisting of only adolescents and physiotherapist separately. Adolescents was the first to speak after the critique phase. Brainwriting was implemented to ensure that both physiotherapist and adolescents had the same opportunities for expressing themselves. The facilitators often expressed that all ideas where equal and had something to contribute with. Repeatedly telling the participants to evaluate all the written ideas through the pro-con and improvement tool.
Verbal	Ridicule patient inputs. Sidelining patient issues as not relevant, not feasible, etc.	Describing that no ideas were better than others, and the participants have to say "yes" to all ideas. In the beginning of the workshop, we placed adolescents and physiotherapists in separate groups. Applied 3-D cases in the workshop were used to ensure a more informal context which could contribute positively to the partnership between adolescent and physiotherapists. Use of humor was applied to create a relaxes and open atmosphere.

Testing the future workshop

Through the course of the workshop, a great number of ideas were generated by the participants. The ideas generated were at the end collected, and formulated into a concrete tool to help future rehabilitation by the research group. The ideas presented by the participants in each phase are described in the theoretical appendix. This resulted in a tool named "A helping hand to rehabilitation" that is centered around inclusion of the adolescent

perspective and beliefs and achieving a capacity to handle their pain in daily life. A full presentation of the tool is seen in appendix 9.

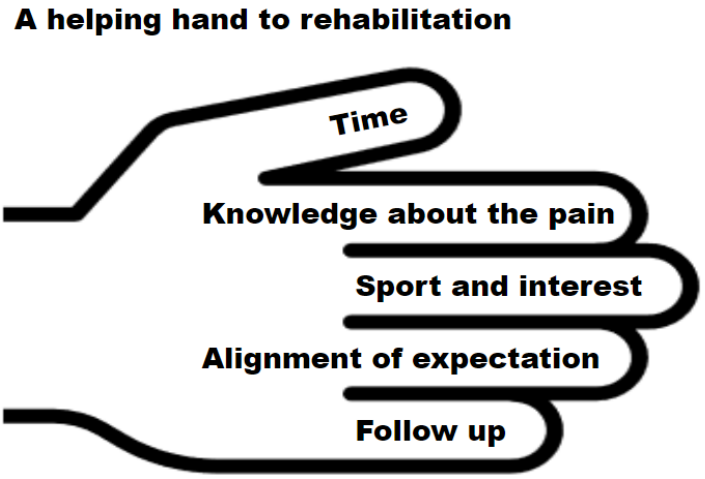

Figure 2: *The tool "A helping hand to rehabilitation"*

Collection of empirical data

The empirical material was gathered through audio recording all conversations and making observations at the workshop. Observation was done by the group member not facilitating the workshop. Further, all participants were interviewed in the following days. All interviews were semi-structured and audio recorded. The interviews consisted of four phases; 1. an opening phase to create a positive relation, 2. a phase encouraging the informants' descriptive evaluation of the workshop, 3. a phase exploring the workshop through theory and 4. a phase condensing the entire experience (Appendix 14,15).

Ethics

We collected verbal informed consent from all participants and parental permission from the adolescence below 18 years of age, for both participation in the workshop and the following interviews. In line with the General Data Protection in Denmark all names are pseudonyms. The semi-structured interviews were conducted online due to time limitations for our participants. This did however allow the participants to choose an environment they felt safe at (ex. their own home), which could increase the quality of the interview despite the virtual barrier [26].

Thematic analysis

A theoretical guided and data driven thematic analysis was chosen to guide the analysis of the empirical material in accordance with general guidelines [27]. The thematic analysis provides great flexibility, which is suitable since we use different sets of data. The coding is done in 6 steps [27] (Theoretical appendix). These are shown in figure 3. Observations from the workshop was not coded alongside the rest of the empirical data, and was instead used as a supplement to the themes generated.

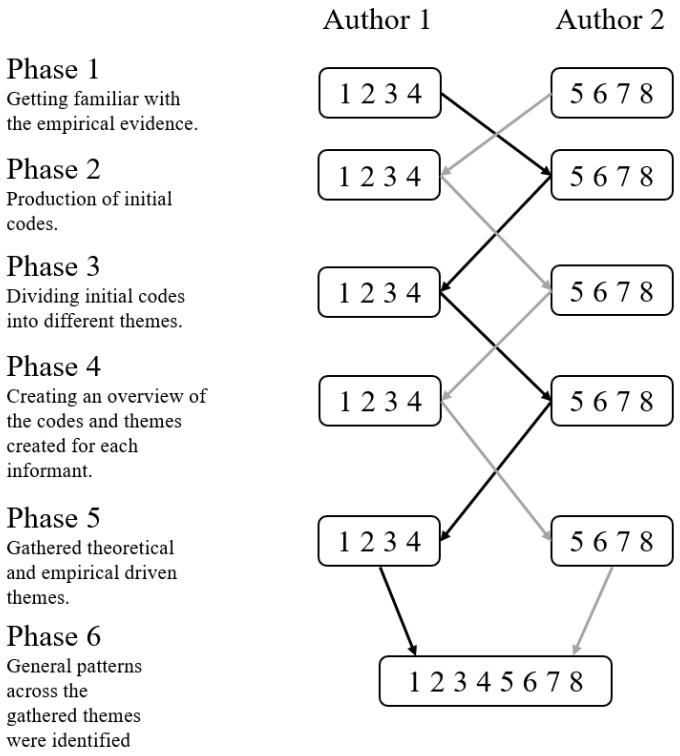

Figure 3: *Representation of the analytical work. The numbers 1-4 represent one transcript of the group conversation and three, interview transcripts with the same being the case for 5-8.*

Findings

We initiated the analysis by evaluating the three distinct areas (Setting, Behavior and Verbal) and mechanisms presented in table 3, and looked at whether such mechanisms excluded adolescents from participating in the development of new models for rehabilitation. Afterwards, we analyzed the participants' experiences of participation in accordance with Hart's ladder of participation.

Setting

For the setting one of the primary factors influencing exclusion were the accessibility of the workshop for adolescents, who do not have the same options for transportation as adults. Furthermore, the size and design of the room the workshop was held in was experienced as a factor. A large room here contributed to a successful workshop since it allowed for separation between the groups, and thereby undisturbed conversation. Both adolescents and physiotherapists expressed that this provided a more intimate and safe environment, since they were not within earshot of the other group. They did however express that the workshop could have benefitted from a larger number of participants, which was linked to a broader set of ideas. However, small groups seemed to help the process, since it allowed for all participants within the workshop to express their views during discussions. This could stem from the adolescents experiencing discomfort expressing themselves towards a larger audience, since physiotherapists always were the one to present ideas in plenum (Appendix 1, 844-889. Appendix 2, 1169-1208). This could however also be contributed to other factors. The time of the workshop also factored into exclusion, since difficulties were experienced finding a time to meet for both physiotherapists and adolescents. This workshop's duration of 4 hours, was however deemed suitable for creating a new treatment option.

Behavior

After evaluating the setting, it has to be considered how the design of the workshop affected behavior and thereby inclusion. The design of the workshop consisted of five phases, but the participants were only directly involved in the critique, fantasy and implementation phase where exclusion shifted slightly.

In the critique phase, the participants were separated into groups consisting of only adolescents or physiotherapists. This led to the participants experiencing both groups having a say in the problems identified:

> " The first part where we had to write down challenges in rehabilitation[…] they [the adolescents] got pretty much the same influence on the new treatment models and the possible new ways to go" (P: Søren, 381-394).

Furthermore, we observed that both adolescents and physiotherapists participated and brought ideas to the table, and both groups expressed that this constellation was beneficial. The adolescents expressed that the discussion with other adolescents had been both interesting and informing, and the physiotherapist expressed that it allowed for a dynamic conversation and idea generation. The physiotherapist however expressed concerns that they might have agreed too much on certain subjects, citing their homogenous group constellation as an 'echochamber' (P: Søren, 221). In general, the separation of the two groups seemed to allow adolescents to have their opinions initially heard within the workshop, and their ideas could therefore be expanded upon in the following phase with the physiotherapist.

To ensure a continuation of the inclusion of adolescents' ideas, brainwriting was implemented. Afterwards one of the adolescents described:

" It was a nice exercise because it gives the opportunity to develop others' ideas and get others' perspectives on your own ideas[…] it opens up new ways of doing things[…] it was interesting to read your own ideas after the other two have made their additions" (A: Mads, 381-392).

However, even though the nature of the brainwriting was experienced as leading to inclusion of adolescents' views, the method presented some difficulties for both physiotherapists and adolescents:

" When you got the idea after it had rotated twice it was difficult to add and write down new ideas compared to when it had only rotated once because the ideas were much further developed[…] it was easier to add your own ideas and perspectives when it had only rotated once" (A: Marie, 268-271).

This presents a problem, since brainwriting in its nature seems to allow for a greater inclusion, but its method excludes some participants with especially the adolescents observed as having difficulties developing on existing ideas (Appendix 20). All physiotherapists suggested time to discuss the ideas during the brainwriting exercise as a solution to this. This could, however, present other problems, since open dialogue could exclude the adolescents' perspectives because we through observations and conversations noted that the physiotherapists sometimes dominated the conversation (Appendix 1, 184-219, appendix

19,20). This might have led to physiotherapists' ideas being overly represented, and creating behavioral exclusion of the adolescents. The adolescent did however in interviews express that they felt their ideas were heard and valued, despite the physiotherapist sometimes dominating conversations:

> " You know in some way I don't really know how to say it[…] but you felt like you were being heard like you weren't just sitting at some clinic answering some questions on a questionnaire, but instead you could talk with the other adolescent and the physiotherapist about how you really felt about our knee[pain] and not just writing something down" (A: Anna, 378-383).

An increased amount of talking by the physiotherapist does therefore not by default seem to result in a feeling of exclusion for the adolescent, as long as the conversation is still centered around a shared idea which the adolescent contributed towards. The conversation could here still be viewed as adult governed, but the inclusion of the adolescents' views within the decision-making process might help ensure that adolescents feel included. However, it is still relevant to consider if a feeling of inclusion is the same as actively being included.

This dichotomy of adolescents feeling included, but maybe not being included was further present in the implementation phase where the participants should formulate a concrete idea that could be implemented into a clinical practice. This design choice might have led to exclusion of the adolescent, since this framework leads to the adolescent's ideas needing validation from the physiotherapist because they have to fit into a clinical practice. This created a power dynamic where the physiotherapist gained an even greater voice compared to the adolescent:

> "It was easier listening to them because they [physiotherapist] knew what was realistic and unrealistic because we [adolescent] do not know how they work and what they are allowed to do and not to do" (A: Marie, 219-223).

However, it might not only be the task that contributed towards an uneven power relation. Instead, the adolescent might have the experience that the physiotherapist had a greater authority from the onset of the workshop, which may be reiterated by the fact that the physiotherapist's opinions were more often expressed than the views of the adolescent. But

also the fact that the adolescent gave greater value to the physiotherapist opinions based on the physiotherapists professional background:

" It was difficult because they [physiotherapist] just knew their shit so I had to consider that, and it was difficult to figure out what I could contribute with" (A: Mads, 416-419).

This experience was shared by Anna, who viewed the adults' ideas as superior and described that they had greater knowledge in the context of helping people (Anna, 466-470). This is also the overall picture observed in the workshop for both groups (Appendix 19,20), which might stem from adolescents being taught that adults are more knowledgeable, which could have an effect on how the two groups interact [21]. Furthermore this might have been strengthened by physiotherapists being viewed as experts in overcoming MSKP, which the adolescents in the workshop suffers from. This influenced the participation of Anna:

"Sometimes I wanted to tell them [the physiotherapist] something, and I was like, no maybe not, when earlier I sometimes thought that it might be useful but I could not really find the right way to say it so that it made sense" (A: Anna, 661-673).

Anna's difficulties expressing her views might have led to her being excluded from the conversation within the group (Appendix 1, 284-643). There were passages where only the two other participants, one physiotherapist and one adolescent talked, and formed somewhat of a group. However this might not entirely have excluded Anna:

"I thought that Marie and Søren had a very strong conversation, but they still brought me into it sometimes. Otherwise it was mostly a conversation between them but that was fine[…] at some point I felt left out of the group, but at the same time I also felt like I was part of the group" (A: Anna, 426-436).

Anna's feeling of still being a part of the group might stem from her feeling safe at the workshop, which is supported by all participants expressing that they felt welcome and included and never experienced any uncomfortable behavior during the workshop. This supports the design being suitable for including adolescents.

However, some amount of behavioral exclusion was still seen in how the physiotherapist talked about the adolescent when not directly interacting with them. Here the physiotherapist had a slightly degrading language regarding the adolescents ability to understand and act upon their own experiences and feelings:

> "It is like [the adolescents] have temporary dementia, they are like zombies and do not understand what is going on" (Transcript gr. 1 & P: Søren, 364-370).

This example aligns well with the previously mentioned barriers for adolescents' participation with adults [16,25,28]. The physiotherapists' downplaying of the adolescents competence and agency in regards to their pain, might have helped maintain a difference in authority between the two groups.

Verbal

As an element to limit exclusion, the participants were told to say "yes" to all ideas which they expressed helped them into a mindset of accepting more abstract ideas and think without limitation. However, towards the later stages of the workshop the physiotherapist started to neglect ideas in favor of keeping the time schedule and having a finished rehabilitation model (Appendix. 2, 620-623). This further supports that some differences in authority between the groups shaped the process. Furthermore the language of the physiotherapist sometimes led to a verbal exclusion of the adolescents, and might have helped to maintain the difference in authority:

> " Sometimes the physiotherapist starts to talk in technical language and I had to ask if I could be included in the conversation because they talked about their work which I cannot really relate to" (A: Mads, 563-570).

However the adolescent expressed that they still felt included by the physiotherapist, since they often explained the professional jargon. This however was because the adolescent actively sought to be included.

The 3-D cases, which were implemented in the design of the workshop to facilitate a comfortable and creative environment, however might have limited exclusion of the

adolescent since they helped create a social bond and gave the adolescent and physiotherapists a more general understanding of each other as experienced by the adolescent Mads:

"I thought that it was a good way to start everything socially by having those brain breaks, with the opportunity to think about the most exotic or coolest vacation you could imagine […] And I was thinking about what the strangest vacation I never had tried was, and suggesting the Sahara after which Søren suggested a trip to space, and I was like, okay, now I know what kind of person he is so that was really cool" (A: Mads, 652-662).

Thereby physiotherapists might have had a greater desire to include the adolescent in the process within the workshop, since the 3-D cases created a more personal relation. Furthermore, the cases were linked to developing a more creative environment and humeroes atmosphere for both physiotherapist and adolescent (P: Helle, 581-584, A: Mads 670-672). This creativity helped the participants bond over areas that drew upon competencies outside of the general workshop, and created a somewhat more equal dialog

In general the design of the workshop seemed to create inclusion of adolescents, but also presents some difficulties when trying to limit exclusion in relation to especially behavioral and verbal exclusion. However, despite the exclusion mechanisms presented, the adolescent still expressed that they felt included within the workshop, and that it was meaningful for them to participate in the creation of the new rehabilitation models. The degree to which the adolescents were included is therefore analyzed in accordance with Hart's ladder of participation.

The adolescents experience of participation

The adolescent generally felt that their perspective was considered, and felt they had an active voice within the workshop. They felt the physiotherapist listened to their ideas, and that they helped shape the rehabilitation options in the different phases.

" I think it was really cool that we actually could contribute and that it was not just the physiotherapist who ruled it all[…] Did you feel your ideas were considered in the discussion?[…] Yes they were" (A: Maire, 239-257).

Despite the adolescent expressing the feeling of being heard, they indicated that they often sought validation from the physiotherapist and that the physiotherapist often was the one taking the lead in forming ideas. This could however be attributed to the aforementioned framework of the implementation phase, as well as the difference in authority. Despite this, Mads expressed that he did not feel undermined by the physiotherapist (Mads, 357-364). Altogether, this indicates a level of participation coinciding with the sixth rung on the ladder, which Hart deems as true participation [21], since the adolescent has a shared decision making with the physiotherapists, where adolescents have an active role in shaping the new rehabilitation model. However, the workshop was a dynamic process that allowed for the positions between adolescent and physiotherapist to switch, which can be seen in the overall participation.

Despite the sixth rung being the most predominant there were also times where the adolescents' participation could be seen as either lower or higher rungs. An example of lower rungs was the case of Anna, who experienced only being consulted and not deciding reminiscent of the fifth rung which consist of only being consulted and listened to, but not actively deciding within the project:

" Marie and Søren had a very strong conversation, but luckily I was brought into the conversation by them. But otherwise it was most a conversation between them" (A: Anna, 423-426)

However, the opposite was the case for Mads, who often initiated the idea the group chose to pursue reminiscent of the eight rung where ideas are initiated by the adolescent and the adult being consulted:

"It was my idea about a tailored rehabilitation program it was the one I wrote down, and they elaborated upon it. So Yes I think […] I think our final product within the group was based on my idea" (A: Mads, 493-499).

This difference might indicate that the workshop does not foster a specific level of participation, with this instead being related to the individual. This should however not be viewed as negative since adolescents' ability to participate can vary in accordance with a

multitude of factors [21]. Anna's participation, compared to Mads, might be a product of him being older, which Hart links to the ability to operate at the eight rung. Anna instead might have been content to participate at the fifth rung. However, Anna's participation was also seen to be especially affected by the difference in authority, which also could have been a factor (A: Anna 466-470). Anna did however express that her best experience of the workshop had been the group work with the physiotherapist, despite her limited participation compared to the other adolescents (A: Anna, 536-538). This supports that she participated at a degree she felt comfortable at.

In general, the adolescent saw themselves as included and truly participatory, which indicates that they had the capacity to enter into a collaborative workshop with physiotherapists and that the physiotherapists were open minded towards including adolescence. It is however relevant to see if the same experience was shared by the physiotherapists.

The physiotherapists' experience of the adolescents' participation

In interviews with the physiotherapist, the same pattern showed of the adolescents' participation being experienced predominantly at the sixth rung with the adolescents participating in the decision-making. However, some differences emerged in how the physiotherapist viewed the adolescents' participation and their own role in securing the adolescents' inclusion. The physiotherapist all viewed themselves as having a greater voice within the workshop, and expressed in the interviews that they felt they had a role in bringing the adolescent into the conversation:

> "I experienced that it was us as physiotherapists who took a lot of the control in the conversations, but the adolescent they still said some things which we listened to" (P: Helle, 200-208).

This can be seen as an example of the participation of the adolescent being at the fifth rung, with the physiotherapist's behavior more reminiscent of consulting the adolescent than having a shared decision-making process with them. At the same time, none of the physiotherapists had an experience of the adolescents initiating the decisions. Instead, they all mentioned that they sometimes doubted if the adolescents' perspectives were truly present in the discussions and if the end product was primarily a product of their opinions (P:Søren, 721-723). Thus, in

the physiotherapists' descriptions, the role of the adolescents was diminished compared to the adolescents' own statements, but still viewed as participatory and included (P:Helle, 144-147). This might be linked to adults often not recognizing adolescents' abilities as decision-makers, even when they are directly involved in the process [21].

In general, the physiotherapist did not express the adolescent as having the same degree of participation as the adolescent experienced. However, when viewing the transcripts from the workshop, a slighter different picture presents itself.

Participation within the workshop

In the transcripts of both groups from the workshop, the sixth rung was still the predominant, but a far greater amount of participation resembling the eight rung presented itself than both the physiotherapist and the adolescent expressed in the interviews. Here it was seen that ideas actually originated from the adolescent and the physiotherapist in collaboration with the adolescent built upon the idea. This is seen when the adolescents Anna, Marie and physiotherapist Søren are having difficulties deciding the timeframe of their idea, and Anna suggests a timeframe which the group accepts (Appendix 1, 725-742).

The same picture was present in group 2, where the adolescent Mads often played a central role in creating and formulating ideas to a greater extent than both he and the physiotherapist Helle and Jens expressed in their interview. An example is when Mads presents the idea that the new treatment option should be online, and asks the physiotherapist how this could be implemented into their practice successfully (Appendix, 2, 739-756).

This exemplifies that the adolescents were included and exhibited true participation to a greater degree than both the group of adolescents themselves and the physiotherapist expressed. This creates somewhat of a paradox of participation with the central question being, why there is a difference in how participation was seen and experienced.

One of the reasons for the difference in what is witnessed in the workshop, and how the participants experienced it, might be related to adolescents viewing the adults' ideas as superior and seeing them as having greater knowledge and authority in the context of helping people.

“ It was difficult because they are professionals and have been working with it for many years, and we are just adolescents with limited knowledge” (Anna, 466-470).

The adolescent, despite their own experiences with knee pain, still seem to value the physiotherapists' opinions greater which could be linked to the aforementioned differences in authority and educational background. This is concerning, since it points towards the adolescents underestimating the importances of their own lived experience with knee pain in relation to creating new treatment options. The physiotherapist might have all the clinical knowledge needed to create “correct” treatments, but if these do not suit the adolescents daily life, there would still be no adherence, and they would be worthless.

We therefore also further need to evaluate if the new model for rehabilitation, formed at the workshop, included the adolescents' perspectives. All adolescents here expressed that they felt the model “A helping hand to rehabilitation” represented the ideas and perspectives they felt were important and had presented in the workshop. This was further shared by the physiotherapist, who felt their perspectives were present in the tool. Therefore despite the elements of exclusion in the design processes, the final outcome seemed to manage securing some inclusion of adolescents in the creation of new models for rehabilitation. It can therefore be considered if inclusion early in the workshop is more essential than inclusion later in the workshop. Early inclusion of adolescents seemed to ensure that their opinions were included in the later stages of the workshop, because of the design with its different stages. Here the critique phases created the framework that shaped the workshop.

Discussion

When discussing “A helping hand to rehabilitation” and the process behind its creation, it has to be recognized that the result of the workshop could have been different with a different group of participants. That both adolescent and physiotherapist feel their views represented, might be a product of the physiotherapist having a patient-oriented view towards rehabilitation reminiscent of a BPSM (Appendix 2, 1-375). Therefore a more differentiated group of physiotherapists might have led to a greater exclusion of the adolescent, since healthcare professionals have been shown unwilling to include children in health research [16].

It should therefore be considered if adolescents should be given unique privileges when participating in a workshop, as for example having their opinions weighted more highly than the physiotherapist or outnumbering the physiotherapists which has been shown to increase the inclusion of the patient group [17]. Another consideration concerning the participants within the workshop, is the relationship between adolescent and physiotherapist only represents one arena of rehabilitation. Parents, trainers, doctors and teachers all represent different arenas the adolescent has to navigate with their MSKP, and therefore influence successful treatments [11,12,19]. It could be considered, if these should be included in future FW.

However, FW is not the only available method for attempting to include adolescents in workshops. Another method that could have been considered, and where certain elements were borrowed from, was "The Creative Platform" [29]. This method focuses on creating a creative and secure environment, which has been linked to greater inclusion of children and adolescents [30]. Furthermore the borrowed element of 3-D cases was perceived as beneficial for the workshop by the participants, and led support to "The Creative Platform" being suitable. The method also focuses on providing the participants with different channels for communication, which has been linked to increased inclusion of children [30].

However, when attempting to determine adolescents' inclusion in this study, some shortcomings concerning the chosen theory also have to be recognized. Firstly the choice of Hart's ladder presented some difficulties concerning its flexibility. The ladder is commonly used to evaluate participation in more static projects [21]. However, our workshop was a dynamic process, where the participation could shift between phases. The ladder might not have been sufficient in noticing the factors that influenced the adolescents' participation. Furthermore, the theory used is either concerned with participation or exclusion mechanism. Therefore no theory directly focusing on inclusion is used, and inclusion here becomes the lack of exclusion or notion of true participation. It might therefore have been beneficial to include theories operating with inclusion of adolescents. However, we did not find any such theories within a context similar to ours.

Conclusion

The aim of this study was to examine how design thinking can be used to promote inclusion of adolescents together with physiotherapists in the creation of new treatment models. Our

future workshop as a design choice seemed to create inclusion of adolescents, but certain factors seem to lead to exclusion despite attempts to minimize this. The interaction between adolescent and physiotherapist seemed to be influenced by authority differences as a result of the profession, and biases towards adolescents. However, parts of the design of the FW with its different phases seemed to help secure inclusion of the adolescents. The critique phase, where adolescents' opinions were represented equally with the physiotherapists and the fantasy phase with brainwriting helped secure adolescents' ideas were implemented in the workshop. Consideration is needed concerning the workshop's aim, which can influence inclusion of the adolescent in the implementation phase, which was oriented more towards the physiotherapist. In summary, we see FW as a suitable method for including adolescents in the creation of new models for rehabilitation.

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