

A Delphi method investigation to prioritise activity-related determinants thought to affect mental health in adolescent populations

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Abstract

Introduction Emergent mental illness during adolescence affects daily functioning, causing disruption to daily activities, routines, and patterns. Multiple inter-related personal, social and environmental determinants influence the onset, nature and subsequent course of those difficulties. Research suggests a bi-directional relationship exists between mental health and activity choices. Activity-focused interventions such as occupational therapy may improve adolescent mental health related outcomes. In this study, we identify and select which activity-related determinants should be prioritised in the development of an occupation therapy-based intervention for adolescents with emerging mental health difficulties using expert consensus. Method A modified two-round Delphi survey method was conducted with occupational therapists and researchers to ascertain a consensus opinion on the prioritisation of specific activity-related determinants that influence 16-to 17-year-olds' Results Eighty-nine determinants were identified and prioritised. Fourteen of these were personal activity-related determinants including 'types of activity' in which young people engage, the 'balance of activities' in which they engage, their 'over and under consumptions of activities', and their 'underdeveloped occupation-based coping skills'. The expert panel prioritised 'personal self-confidence', 'values', and 'perception of confidence' in relation to the activities adolescents do. **Conclusions** This study generated a detailed picture of the activity-related determinants that are important in adolescence, and aligns with the adolescent model of occupational choice. Our findings have potential to inform activity-related intervention development and policy. Further research is needed, particularly to understand young people's perspectives on these determinants and to investigate the determinants that would benefit from further empirical research.

Introduction

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Method

A modified two-round Delphi survey method was conducted with occupational therapists and researchers to ascertain a consensus opinion on the prioritisation of specific activity-related determinants that influence 16-to 17-year-olds'

Results

Eighty-nine determinants were identified and prioritised. Fourteen of these were personal activity-related determinants including ‘types of activity’ in which young people engage, the ‘balance of activities’ in which they engage, their ‘over and under consumptions of activities’, and their ‘underdeveloped occupation-based coping skills’. The expert panel prioritised ‘personal self-confidence’, ‘values’, and ‘perception of confidence’ in relation to the activities adolescents do.

Conclusions

This study generated a detailed picture of the activity-related determinants that are important in adolescence, and aligns with the adolescent model of occupational choice. Our findings have potential to inform activity-related intervention development and policy. Further research is needed, particularly to understand young people’s perspectives on these determinants and to investigate the determinants that would benefit from further empirical research.

Keywords : Occupational Therapy, Social Determinants of health, Young People, Mental health, Delphi Technique

BackGround

Selecting and prioritising determinants for an occupation-based intervention

The emergence of mental illness during adolescence is known to affect daily functioning, specifically disrupting daily activities, routines, and patterns (Parsonage, 2016; McGorry & Mei, 2018) with potentially long lasting consequences for the individual, their family and society (Patton & Temmerman, 2016; Patton *et al.*, 2016). Conversely, a narrative review of leisure activities and a multi-level theoretical framework of mechanisms of action suggests the relationship between mental health and activity choices is actually bi-directional (Fancourt *et al.*, 2021). Neuroscience provides further insight illuminating potential mechanisms by which engaging in activity within one’s environment affects adolescent brain development and may present an opportunity for intervention (Larsen & Luna, 2018).

Novel interventions are needed to address rising levels of adolescent mental health difficulties internationally (Mei *et al.*, 2020). Reviews highlight the limitations of current approaches (Das *et al.*, 2016). Developing interventions using an occupational therapy approach to improve mental health shows potential (Kirsh *et al.*, 2019). Although there is limited research supporting this approach in adolescent populations (Parsonage-Harrison *et al.*, 2022). Occupational therapy approaches incorporate a focus on the person, and their daily activities (known as occupations) in the context of their environment (Creek, 2006). The evidence-base for using activity in adolescent populations to improve mental health remains problematic (Parsonage-Harrison *et al.*, 2022 & Das *et al.* 2016). Effective intervention development requires the identification, selection and prioritisation of determinants or factors affecting behaviour change to improve health outcomes (Bartholomew-Eldredge *et al.*, 2016).

The onset, nature, and subsequent course of mental health difficulties may be improved if multiple inter-related personal, social and environmental determinants are addressed (Viner *et al.*, 2012; McGorry *et al.*, 2014; Patel *et al.*, 2018; Mei *et al.*, 2020), minimising the disruption to an individual’s life. The value of addressing determinants at sub-clinical symptom threshold levels before severe functional impairments emerge is strongly advocated internationally, but remains a challenge (McGorry, & Mei, 2018). Knowledge of the effects of these many determinants on the emerging and early stages of mental health difficulties is limited (Cairns *et al.*, 2015; Bale *et al.*, 2020). Earlier qualitative work identified determinants connected to adolescents’ choices about the activities they do (Parsonage *et al.*, 2020). The work, highlighting a process of considering time factors, appraising values and priorities, interaction with the situational context and an exploration of skills and occupational repertoire, that through experience shapes the development of an adolescent’s future self (Parsonage *et al.*, 2020). Given the potentially modifiable nature of many of these determinants, knowing which are realistic to attempt to change and have greatest influence on health outcomes, is important for intervention development.

A wealth of experiential knowledge based on using activity to improve adolescent mental health exists internationally in the form of clinically practicing occupational therapists and researchers, that can help to inform intervention development for adolescent populations. Multiple methods exist to identify and prioritise determinants when developing interventions, we adopted Intervention Mapping framework for intervention development, which advocates a systematic consultation of the literature and a wide variety of stakeholders at all stages of the development process (Bartholomew-Eldredge *et al.* , 2016). Stakeholder involvement helps maintain focus on issues of concern; ensures intervention acceptability to the target population; increases expertise on the project; and improves external validity (Bartholomew-Eldredge *et al.* , 2016). Involvement reduces researcher bias towards certain topics or ideas and can highlight ideas the researcher may not otherwise have thought of (Bartholomew-Eldredge *et al.* , 2016).

This paper reports on a novel Delphi study conducted with an expert stakeholder group of occupational therapists and researchers working with adolescents or related researching topics. The study was undertaken to select and prioritise the determinants connected with what activities or occupations young people choose to do, in their daily lives, that influence their mental health. To the best of the author's knowledge, no study has previously been conducted with occupational therapists and researchers, to prioritise occupation or activity focused determinants related to adolescent choice that may affect or influence mental health.

Aim

To establish an expert consensus view of which occupational determinants should be prioritised within the development of an occupation therapy-based intervention for adolescents with emerging mental health difficulties.

Ethics

The study received approval from Oxford Brookes University Research Ethical Committee (UREC no.191347).

Method: The Delphi method and seeking consensus

An electronic two round Delphi survey method was chosen, designed to establish an expert 'consensus of opinion' evolving from individual experts' anonymised judgements, disclosed through multiple iterative rounds of questionnaires (Keeney *et al.* , 2001; Dimitrijević *et al.* , 2012; McPherson *et al.* , 2018; Sossa *et al.* , 2019). The method is suited to addressing practice-related problems where human judgement is required to solve complex problems (Powell, 2003; Steurer, 2011; Dimitrijević *et al.* , 2012; Donohoe *et al.* , 2012) and has previously been used to prioritise determinants important to adolescent mental health (Cairns *et al.* , 2015; Bale *et al.* , 2020). This method enables the inclusion of participants from a broad range of geographical areas (McPherson *et al.* , 2018), and makes the distribution, collection and analysis of data cost-effective and time-efficient (Dimitrijević *et al.* , 2012; Donohoe *et al.* , 2012), all of which were important for this study.

Recruitment and selection of the expert panel

The representativeness of the expert panel is important and the selection of experts is influenced by the information the researcher wants to gather (Steurer, 2011). We set the following criteria for our expert panel; Participants must hold a qualification as an occupational therapist and have experience of working with adolescents, or be a researcher, working with adolescents with an occupation focus. These criteria were checked by potential participant's responses to self-report and verification questions. The research team identified potential participants through specialist groups and the peer reviewed literature. Each potential panel member received an email invitation to participate. We opted for a minimum of twenty participants, reflecting the typical numbers used in the Delphi studies literature, and in light of the lack of formal recommendations in the literature (Keeney *et al.* , 2001; Dimitrijević *et al.* , 2012).

Questionnaire development

The Delphi study was structured in two parts. The first part consisted of an information sheet followed by seven consent related questions and questions designed to check about the expert panel members experience. The second part was formed of six questions informed by the intervention mapping framework. Each of the 59 occupation related determinants identified in relation to adolescents' mental health through three earlier studies (Parsonage *et al.*, 2020, Parsonage-Harrison *et al.*, 2022, Parsonage, 2022) were organised under the appropriate question heading. As suggested by Dimitrijević *et al.*, (2012) to ensure reliability, the questionnaire was piloted. The questionnaire format was developed for distribution using Qualtrix XM (Qualtrix, 2005), then piloted by three researchers before being distributed via email following amendments. The development of round two followed the same process.

Delphi rounds

We conducted a modified two round Delphi study, replacing the open-questions round typically used in round one of a Delphi with a ranking question round (Keeney *et al.*, 2011). Participants were given the option to add additional qualitative information in round one. Three rounds were originally planned but due to a moderately high-level agreement after the second-round, coinciding with the beginning of Covid pandemic, the research team agreed a third round was not required and should not be conducted to avoid unnecessary burden on clinicians.

Based on their professional opinion, participants completing the first Delphi round were given the option to add determinants before ranking them according to which they considered had the greatest impact on mental health. Following the closure of round one, the data was exported from Qualtrix XM (Qualtrix 2005) into Microsoft Excel (Microsoft Corporation, 2016). In round two, participants received a summary of their responses, and a summary of the whole panel's results. The rationale was to provide the participant with an opportunity to reflect on their choices (McPherson *et al.*, 2018), and encourage a response to round two (Murphy M.K. *et al.*, 1998; Powell, 2003).

Achieving consensus

Delphi studies aim to achieve a consensus opinion, defined as the general agreement arrived at (McPherson *et al.*, 2018). Considerable variability exists in how consensus is both defined and achieved (Bowles, 1999). We chose a frequently used ranking system (Powell, 2003), using a weighted points system to reflect the number of times an item was selected and its position in the ranking, resulting in a total score. This total score was used to rank and identify the consensus. A further non-parametric assessment, Kendall's W coefficient of concordance, was used to consider the extent of agreement between those rating each round (Sossa *et al.*, 2019). The following divisions can help to provide a benchmark for considering levels of agreement (Landis and Koch, 1977): poor agreement = less than 0.20, Fair agreement = 0.21 to 0.40, Moderate agreement = 0.41 to 0.60, good agreement = 0.61 to 0.80 and very good agreement = 0.81 to 1.00.

Results

Twenty people agreed to participate as panel members. Two blank responses were excluded. One participant submitted a partial and a completed response, only the completed questionnaire was analysed. A computer error effecting consent questions was identified, so the research team sent an additional email to 11 of the 17 respondents to confirm full consent. This resulted in a total of 15 consenting expert panel members in round one, who were invited to take part in round two. The second Delphi round received 13 responses.

Of the fifteen panel members in round one, four self-identified as a researcher and twelve as state registered occupational therapists working with adolescents. Thirteen participants reported at least five years of work experience, while six indicated they had over 10 years' experience. All but one panel member agreed with the statement that in their professional opinion the way adolescents spend their time affects their wellbeing. Responses from round one added a further 30 determinants, to the original 59 determinants previously identified (see Figure 1 for details). All of the determinants included in the Delphi are available in Appendix 1.

Add here Figure 1

In question one, round one item scores ranged from 36 to 175 and 18 to 154 in round two. The most frequently selected determinants relating to what adolescents do, that affects their mental health, were: ‘types of activity’ (n154) and ‘balance of activity’ (n137). These two determinants achieved the highest level of agreement (31%) in round one and increased in round two to 90% and 60% respectively. The item ranked third was the ‘pressure to conform’ (n130) but the level of agreement decreased from 27% to 20% between rounds (See Table 1 for details).

Insert Table 1 here

In question two, concerning the behavioural determinants affecting adolescent activity-related performance and wellbeing, scores ranged from 53 to 167 in round one and 30 to 100 in round two. The level of agreement in round one between the two highest prioritised determinants, ‘under-developed coping skills’ (n167) and ‘over or under consumption of activities’ (n153) is very similar at 33% and 31%. In round two ‘over or under consumption of activities’, referring to concerns about the amount of time spent in an activity, was ranked highest with n100 (67%), and above that of ‘under-developed coping skills’ (n95), referring to the skills an adolescent has to cope with life’s challenges, was rated highest in round one. After these first two determinants, the next highest-ranking items are ‘inadequate balance of activities’, referring to the balance between the various activities a person does, and ‘risk behaviours’, referring to activities that put an individual at risk of harm. In question 2 of the second round, the highest level of agreement for the ranking of any of the 17 determinants, was 67%, for items prioritised as most important and least important. The lowest level of agreement, 22%, was for the midrange prioritised items.

Question three concerned which personal determinants have the greatest impact on mental wellbeing, scores ranged from 59 to 173 in round one and 28 to 146 in round two. ‘Personal self-confidence’ (n146), was ranked as having the greatest impact on mental wellbeing, and the level of agreement increased from 46% to 70% between round one and two. The ranking, for ‘perception of competence’ (n120), ‘personal skills’ (n113), and ‘cultural values’ (n102), changed between rounds, but the level of agreement increased. At an interpersonal level (question four), scores ranged from 19 to 119 and the determinants most likely to influence adolescents’ choices about what to do were thought to be ‘peers’ and ‘siblings’, with ‘peers’ scoring the highest level of agreement (90%) between panellists. The next highest level of agreement was observed in the lower ranked determinants (80%) ‘counsellors’ and ‘other professionals’. The level of agreement between middle ranked determinants was low, ranging from 20% to 50%.

In question five, scores ranged from 38 to 145 in round one and 21 to 169 in round two. ‘Geography and locality’ (n169) was the community-based determinants ranked highest across rounds with an increased level of agreement. Next were two items, ‘social determinants’ (n151) and ‘nature and quality of family relationships’ (n151), with a level of 50% agreement. Panellists’ comments suggest this question was difficult to answer because of the variety of different community settings which exist, and because the impact of the environment depends on an adolescent individual’s circumstances.

Finally, in question six, Scores ranged from n59 to n101 in round one and n17 and n75 in round two. The highest ranked societal or organisational determinant thought to affect mental health, which had the highest level of agreement, was ‘local council investment in services’ (n75). The first three highest ranked determinants did not change position in the ranking between rounds, but the level of agreement on the ranking increased. Across the different questions it is evident ranking remains similar between rounds, while the percentage level of agreement appears to increase. Agreement appears be greatest at the upper and lower ends of the ranking with the items in the middle showing lower levels of agreement.

In addition to the percentage level of agreement achieved with regard to the rankings of determinants for each question, the agreement between those rating items between rounds was examined, using the non-parametric test, Kendal’s co-efficient of concordance (Kendal’s W) (Sossa *et al.* , 2019), the results of are recorded in the table 2.

Insert Table 2 here

Table 2 shows the level of agreement between round one and round two, has increased from that observed in the first round. The observed levels of agreement for round one of the Delphi can be rated as poor, increasing to a moderate level of agreement in round two (Landis and Koch, 1977).

Discussion

Eighty-nine different occupational related determinants thought to affect adolescents' mental health were ranked and prioritised. This Delphi study achieved a level of agreement on the prioritisation of determinants with each question but the results highlight a range of different responses when ranking the determinants. The results suggest a range of modifiable and non-modifiable determinants and that the importance of each of them may vary. Our findings highlight the complexity of rating activity related determinants against each other, and the need for consideration of the nuanced areas affecting occupational choices in adolescent populations. These findings are supported by earlier research that highlighted the complexity adolescents experience when making choices about what to do with their time, highlighting a process of weighing up four domains against each, which are 'considering time factors', 'exploring skills and occupational repertoire', 'Interacting with the situational context' and 'appraising values and priorities (Parsonage 2020). Occupational therapy literature suggests a complex interrelated relationship exists between the subjective concept of 'occupational balance' and the objective concept of 'patterns of daily activities' that have implications for health (Eklund *et al.* , 2017).

In our study occupational therapists and researchers ranked the determinants 'types of activity', 'balance of activity', 'pressure to conform' and 'freedom of choice' as highest for their effect on mental health. The expert panel ranked determinants linked to behaviours affecting occupational performance and health. The highest ranked included 'under and over consumption of activities', 'underdeveloped coping skills', and 'inadequate balance of activity types'. The prioritisation of these determinants is important in adolescent populations and provides a valuable life course perspective for occupational therapy research targeting adolescent mental health. Prioritised determinants can be used to focus adolescent mental health research, and may be particularly relevant to occupational therapists. For example, an occupational therapy theory informed intervention for adolescents with emerging mental health difficulties is currently being developed by the first author based on the top three prioritised determinants from the first three questions.

In this study a moderate level of agreement was reached, the levels of agreement increased between rounds and the rankings remained mostly consistent for items at the upper and low ends of the scale. The panel of this study was small, vulnerable to selection bias, and may not represent all views given the loss of some participants during the study. This should be balanced against the fact that the occupational therapy profession is small and specialised. The panel had a high number of years of relevant experience and responses may reflect an evidenced-based approach embedded in clinicians' thinking. A brief sensitivity checking exercise conducted at a conference in 2022 as part of disseminating the findings, using question one, suggests those with experience of mental health issues as adolescents organised items in a similar way to our study results. This study highlights the need for more research into the impact of occupational determinants on adolescent mental health and research is needed to ensure adolescents' perspectives are properly captured.

In summary, the use of the Delphi methodology enabled access to the valuable, experiential knowledge of researchers and those providing interventions to adolescents with mental health difficulties, and the selection and prioritisation of occupational determinants that affect mental health. To the best of the authors' knowledge, this is the first Delphi study identifying and prioritising occupational determinants that affect mental health in adolescents and could help to inform activity-based interventions targeting adolescent's mental health difficulties.

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Data Sharing

Data available on request due to privacy/ethical restrictions

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Conflicts of Interest statement

There are no conflicts of interest to disclose.

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Tables

Table 1: Determinants, ranking, score and percentage agreement between rounds for question 1 to 6

Question 1: What adolescents do that affects mental wellbeing?

Determinants

Types of activity. *E.g. sleep, exercise, social media, creative arts, pets, time with friends, reading, time with family, schoolwork*

Balance of activity. *E.g. such as the particular combination of activities that meeting basic needs, like food, safety, security,*

Pressure to conform. *E.g. to achieve, to identify a future career path, fit in with friends.*

Question 2: What behaviours adversely affect adolescent's activity performance and consequently their mental wellbeing?

Determinants

Over or under consumption of some activities *e.g. social media, passive activities*

Underdeveloped coping skills

Inadequate balance of activity types *e.g. balance of self-care, leisure & work*

Question 3: What are the personal determinant or factors with greatest impact on mental well-being?

Determinants

Personal self confidence

Personal values

Perception of competence

Personal skills

Cultural values

Question 4: Who at an interpersonal level are likely to influence adolescent choices about what to do?

Determinants

Peers

Siblings

Parents

Teachers

Question 5: What are the community determinants that influence what young people do in their daily lives?

Determinants

Geography and locality. *E.g. what facilities are available in the local area or access to public transport.*

Social determinants. *E.g. wealth, and culture of the area*
Nature and quality of relationships with family members.
Quality of available support systems. *E.g. mentors, guides, counselling etc.*
Local Resources to support activities. *E.g. music lesson, local bus network, sports facilities*
Opportunity for exploring or developing interests in specific occupations

Question 6: What are the organisational and societal factors that affect what late adolescents do in their da

Determinants

Local council investment in services
Finance investment in schools for extracurricular activities
National curriculum

Table 2: Levels of agreement between rounds

Question	Round	Kendal's W	Agree	Round	Kendal's W	Agree
1 Doing determinants	1	0.057	Poor	2	0.458	Moderate
2 Behavioural determinants	1	0.289	Poor	2	0.42	Moderate
3 Personal determinants	1	0.091	Poor	2	0.504	Moderate
4 Interpersonal determinants	1	N/A	N/A	2	0.537	Moderate
5 Community determinants	1	0.083	Poor	2	0.535	Moderate
6 Societal and organisational determinants	1	0.078	Poor	2	0.468	Moderate

Figures legends

Figure 1. A descriptive outline of the Delphi process: The figure shows the questions asked, the number of determinants identified before the start of the first round and later in the second round.