Developing and pre-testing a scale to measure adolescents´ rights, duties and responsibilities in relation to their health choices

Abstract

Background. Adolescents´ health choices have been widely researched, but the ethical basis of these choices, namely their rights, duties and responsibilities, have been disregarded and scale is required to measure these.

Objective. To describe the development of a scale that measures adolescents´ rights, duties and responsibilities in relation to health choices and document the preliminary scale testing.

Research design. A multi-phase development method was used to construct the Health Rights Duties and Responsibilities *(HealthRDR)* scale. The concepts and content were defined through document analysis, a systematic literature review and focus groups. The content validity and clarity of the items were evaluated by expert panel of 23 adolescents, school nurses and researchers. We then calculated the content validity index and the content validity ratio at on item and scale levels. Preliminary testing was conducted with 200 adolescents aged 15-16 years. Descriptive statistics, Cronbach´s alpha correlation and statistics for the item-analysis were calculated.

Ethical considerations. Ethical approval and permission were obtained according to national legislation and responsible research practice was followed. Informed consent was obtained from the participants and the parents were informed about the study.

Findings. The *HealthRDR* scale comprises of four sub-scales with 148 items: 15 on health choices, 36 on rights, 47 on duties and 50 on responsibilities. The items had a 0.93 content validity index and a 0.85 content validity ratio. The Cronbach alpha correlation coefficient was 0.99 for the total scale and the individual sub-scales scores were: health choices (0.93), rights (0.97), responsibilities (0.99) and duties (0.98).

Discussion. The findings are discussed in light of the ethical concepts and validity and reliability of the developed scale.

Conclusion. The *HealthRDR* scale defines and understands adolescents´ rights, duties and responsibilities in relation to health choices and has good content validity. Further testing and refinement of the concepts are needed.

Keywords

Adolescents, duties, health choices, instrument development, responsibilities, rights

Background

Adolescents´ health choices are conscious or unconscious decisions that influence their health[1–3]. They are ethical issues that culminate into their right to make their own decisions[4–6]. Rights refer to having a claim to something and they can highlight actions that are regarded as permissible[7]. From the perspective of adolescents` health choices, they focus on their individual right to participate in their health and make their own basic decisions, about their choices and wellbeing[8]. However, their right to make their own choices mean that they also have a duty to respect the similar rights of other people[5,9–11]. Duties refers to things that adolescents should do in relation to their health[12]. Adolescents have duties in relation to themselves and their own health, but they also have a duty to acknowledge others when making decisions[13,14]. Rights and duties about health choices are connected to responsibilities[9,15,16]. Responsibilities refer to adolescents taking care of their own health choices, including practical everyday tasks that relate to their health[17–19]. However, rights, duties and responsibilities also cover aspects of other peoples´ health[10,13,19].

Adolescents´ rights, duties and responsibilities in relation to their health choices are complex issues at individual, community and society levels and they include personal health, the wellbeing of others and healthcare services[10,13,20–22]. They are needed to produce the best care for this group and to ensure that adolescents can actively participate in making their own health choices[14,15,23,24]. Thus focusing on the rights, duties and responsibilities that adolescents have to make their own health choices means that they are active agents, who have the opportunity to influence their own health[2,25,26]. However, adolescents´ health choices can also expose them to health risks[21,27] and the choices that they make can have long-term influences on their future[28,29].

Adolescents´ rights, duties and responsibilities in relation to their health choices are based on ethics[5,6,30], legislation and international declarations[8,31] and they are also linked to dignity[4,6] and justice[6,30,32] with regard to their health and health services. Their rights, duties and responsibilities aim to offer them dignity and reassure them that they will be treated in an equal and fair way when they seek healthcare[4–6,33,34]. Dignity means that adolescents have equal value as human beings and are respected[33]. Justice includes equal rights to make their own decisions, but also includes a fair distribution of duties and responsibilities[5,30]. Justice also means that adolescents are offered the opportunities they need to achieve and fulfil their rights, duties and responsibilities to make health choices. It is acknowledged that their access to these rights vary and are often violated[11,35]. For example, health differences can be seen both globally and between different socioeconomic groups[34,36–38]. Adolescents can have different opportunities in relation to their knowledge, education, social relationships and socio-economic position[29,36,39]. Thus, rights, duties and responsibilities in relation to their health choices need to be examined in relation to their individual situation, as well as, in relation to their wider contextual circumstances.

However, in healthcare and previous studies, the focus has been mainly placed on the adolescents´ actual health choices and not on the ethical basis of those decisions.

Previous studies have disregarded the ethical reasons behind health choices, which focus on rights, duties and responsibilities[40]. Definitions of these important values[11,19,31,41,42] vary, or are missing, and there are no existing tools to measure adolescents´ perceptions of their health choices with regard to their rights, duties and responsibilities[40]. Clearer definitions of adolescents´ rights, duties and responsibilities could help us to understand the topic[43] and how it influences the way healthcare and society see adolescents and the ethical basis of their health choices[44]. A validated scale is needed to measure these concepts in a tangible way. A more comprehensive description of adolescents´ rights, duties and responsibilities in relation to their health choices is needed to understand the choices they make[13,14,19] and to strengthen our knowledge of the topic and the ethical basis of health science and health promotion in relation to this area[44,45].

Objectives

The purpose of this study was to describe how we developed a new scale to measure the rights, duties and responsibilities related to adolescents´ health choices and to document the preliminary testing of the scale. The objectives were to: i) to define the concepts of their rights, duties and responsibilities, ii) to develop the scale items and assess the content validity based on the assessments of different stakeholders and iii) to conduct preliminary validity and reliability testing of the scale.

Methods

The development of the new scale consisted of three phases (Table 1) and followed the process described by DeVellis[46] and Streiner et al[47].

Table 1. The phases involved in developing the scale to measure adolescents´ rights, duties and responsibilities in relation to their health choices

Phases and steps			Method
Conceptual basis	Phase 1. Defining the conceptual basis of the scale ¶		
	I	Define the concepts at individual, community and society levels	Analyse 54 -steering documents[48]
	II	-Define and describe the concepts -Identify existing instruments	Analyse 13 papers identified by the systematic literature review for previous knowledge[49]
	III	Define and describe the adolescents´ perceptions of the concepts	Hold focus group with 67 adolescents aged 15-16 years[50]
Item development	Phase 2. Developing the scale items and evaluating the content validity		
	IV	Identify and describe different elements of the scale (scale blueprint)	Based on Phase 1 and other relevant literature
	V	Develop items based on the blueprint	Item construction
	VI	Get panel to assess the content validity and clarity of the items.	Panel of 23 stakeholders Content validity index (CVI) and Content validity ratio (CVR)
Preliminary testing	Phase 3. Preliminary testing		
	VII	-Carry out feasibility testing of the scale format, instructions and usability -Evaluate the reliability and validity of the scale	Preliminary testing with 200 adolescents Descriptive statistics, Cronbach's alpha correlation, corrected item-to-total correlations
148- item *HealthRDR* 1.0 scale			

¶ Reported elsewhere: Author 2015[25], Author 2018[26], Author 2018[27].

Phase I: defining the conceptual basis of the scale

The concepts of adolescents´ rights, duties and responsibilities in relation to their health choices were defined based on previous studies[46,47,51] including empirical and theoretical studies[10,13,14,19,52] and a systematic review[40] (Table 1).

Phase 2: developing the scale items and evaluating the content validity

The content and blueprint for adolescents´ rights, duties and responsibilities in relation to their health choices were identified and described using both deductive and inductive methods [53,54] in the first phase. We also used other relevant literature, including theoretical papers and text books[46,47]. The items were developed based on the blueprint, by putting together a large number of items covering all aspects of the adolescents´ rights, duties and responsibilities in relation to their health choices. The items had two dimensions: fulfillment and importance.

The content validity and clarity of the items were assessed using the expert analysis method[46,47,51] (Table 1), with panel members (Table 2) who were recruited to electronically rate the relevance and clarity of the items on a four-point scale. A score of one was used if they thought the item was not relevant or clear, two was somewhat

relevant or clear, three was quite relevant or clear and four was very relevant or clear[46,51,55]. The panel was also encouraged to make comments and suggestions to improve the items and scale.

Table 2. The 23 panel members

Participants		n
Adolescents	Students aged 15 and 16 years old from secondary schools in Eastern Finland	11
School nurses	Nurses experienced in adolescents´ health promotion from secondary schools in Eastern Finland	7
Researchers	Early stage, post-doctoral and experienced researchers experienced in the field of health promotion or instrument development	5
Total		23

We used the content validity index (CVI) and content validity ratio (CVR) to measure the extent of the agreement by the panel. The CVI indicated the proportion of members who rated it as three or four on the four-point scale[55,56]. The CVR was calculated using Lawshe´s formula (1975). The CVI and CVR were calculated separately for the relevance and clarity of each item (I-CVI and I-CVR) and then combined by taking the mean value of both the I-CVI and I-CVR. A decision about the relevance of each item was considered in relation to a report by Polit et al. (2007), which specified a critical I-CVI of 0.79, and from a proposal by Ayre and Scally (2014) that recommended a significance level of 5%. Items with a CVR of > 0.39 could be regarded as valid based on the expert evaluations [58]. In addition, we assessed the content validity of the sub-scales and scale (S-CVI/average and S-CVR/average) by taking the average CVI and CVR across the items between the sub-scales and the whole scale[55].

Phase 3: preliminary testing

Preliminary testing was used to measure the feasibility of the scale format, instructions and usability. In addition, preliminary validity and reliability testing of the scale was conducted.

Recruitment

We recruited adolescents aged 15 and 16 years old from 12 secondary schools in eastern Finland from October to December 2017. After receiving permission from the school district to carry out the research, the researcher contacted the individual schools to ensure they were willing to take part in the study and obtained their permission for their students to participate. We then worked with the school principals to send electronically information about the study to all ninth graders and their parents. The letter included a link to the online questionnaire that the adolescents could fill in during their spare time. After one reminder message and reminders from teachers, this only generated 19 responses, which is why the data collection was expanded. In six of the schools that agreed to take part, the researcher or teachers presented the study details to the 15 to 16-year-olds and gave them the opportunity to complete the questionnaire during lesson time. According to the previous literature, a sample size of 200 has been considered sufficient to conduct preliminary testing of a scale like this, when the aim was to pilot the

scale[59,60]. Therefore, a total of 1,026 adolescents were approached and the data collection was concluded when 200 responses had been received. The majority of the respondents (82%) used a computer to fill in the questionnaire, 7% used a smartphone, and 2% used a tablet computer. The other 9% did not state what kind of device they used.

Analysis

Statistical analyses were conducted using the Statistical Package for the Social Sciences version 24 (IBM Corp., Armonk, New York, USA) and each item was analyzed separately for fulfilment and importance. We used analysis methods that studies have shown are suitable for the early stage of the scale development process. This enabled us to evaluate the performance of the developed items[46,47]. Individual item characteristics were assessed by calculating the mean, standard deviations and variances for each item[46]. The internal consistency of the scale and sub-scales were assessed using Cronbach´s alpha to estimate how well the scale items fitted together as a concept[47,56]. To assess the items´ correlation to the total score, we calculated corrected inter-total correlations and inter-item correlations. Items with a correlation of less than 0.3 were discarded[47], because they did not sufficiently contribute to the total score.

Ethical considerations

This study followed the research ethics principles of the Declaration of Helsinki[61] and responsible research practice[62] was observed during all the phases of the study. Approval was granted by the Ethical Committee of the University (Statement 19/2017) and we received permissions from the health- and school districts and the individual schools to collect data from the school nurses and adolescents. Informed consent was obtained electronically before we collected data from the participants. Participants had the opportunity to ask the researcher questions about the study in person, by email or phone before agreeing to take part. According to Finnish law, this study did not need parental approval, because the participants were more than 15 years old, but the parents were informed about the study during all the data collection phases[63].

Findings

Phase 1: Definition of adolescents´ rights, duties and responsibilities in relation to their health choices

As a result of our research, we defined health choices as conscious or unconscious decisions that can have a direct or indirect influence on health. They are influenced by complex factors at individual, community and society levels. Rights have been defined as independent health choices and having the opportunity to participate in issues that affect an individual, but they also concern fulfilling basic needs and obtaining services from society. Duties related to health choices mean something that needs to be done or is recommended. Responsibilities refer to an individual looking after themselves and others and accomplishing required tasks. Rights, duties and responsibilities in relation to their health choices are closely linked, but they are also separate and justifiable on their own.

Phase 2: The new *HealthRDR*-scale and content validity of the items

The theoretical knowledge we gained in Phase 1 was put into the *HealthRDR* scale, with four sub-scales on adolescents´ health choices, rights, duties and responsibilities. The items in the sub-scales focused on their own health and wellbeing, individual choices, healthcare, others and the meaning and importance of rights, duties and responsibilities in relation to their health choices (Table 3). All items were positively worded and included two dimensions: fulfilment and importance. We used a five-point Likert type scale, ranging from one for never fulfills/not at all important to five, for always fulfills/extremely important. There was also the option to not answer a question. The first version of the scale, *HealthRDR* 0.1, comprised 168 items: 28 items that focused on health choices, 41 on rights, 48 on duties and 51 on responsibilities (Table 3).

Table 3. Characteristics of versions 0.1, 0.2 and 0.3 of the *HealthRDR*-scale

Sub-scales	**Example of items**	***HealthRDR version* 0.1**	***HealthRDR version* 0.2**	***HealthRDR version* 0.3**
Health choices		28	25	15
Making independent choices	I can decide whether or not to wear a cycle helmet, independently and without interference from others.	9	9	3
The way choices are made	I generally consider the potential health impacts of my health choices.	7	7	3
Influence of choices	My health choices influence how well I manage my everyday life.	12	9	9
Rights in relation to		41	41	36
My own health and wellbeing	I have a right to rest and sleep.	7	7	7
Individual choices	I have a right to make independent health choices without interference from others.	6	6	4
Healthcare	I have a right to get healthcare services even before I have fallen ill.	11	11	11
Others	I have a right to be protected from unhealthy choices.	5	5	5
Meaning and importance of rights	My rights in relation to health choices enable me to maintain and improve my health.	12	12	9
Duties in relation to		48	47	47
My own health and wellbeing	I have a duty to rest and sleep so that I am able to cope with everyday life.	10	9	9

Individual choices	I have a duty to make choices that promote my health.	5	5	5
Healthcare	I have a duty to participate in making decisions concerning my own health.	11	11	11
Others	I have a duty to help in case of emergencies.	9	9	9
Meaning and importance of rights	My duties in relation to health choices improve public health.	13	13	13
Responsibilities in relation to		51	50	50
My own health and wellbeing	I have a responsibility to take care of my own medication.	12	11	11
Individual choices	I have a responsibility to avoid unhealthy choices.	4	4	4
Healthcare	I have a responsibility to attend routine healthcare checks, for example with the school nurse or dentist.	11	11	11
Others	I have a responsibility to take care of my friends´ health and wellbeing	8	8	8
Meaning and importance of rights	My responsibility in relation to health choices enable me to participate in my own healthcare	16	16	16
	Total items	168	163	**148**

The content validity for the total scale scored a S-CVI/average of 0.92 and S-CVR/average of 0.84. We deleted five items with I-CVI scores ranging from 0.67 to 0.78[55] and CVR scores from 0.33-0.60[58,64] (Table 4). After deleting these items, the S-CVI/average was 0.93 and the S-CVR/average was 0.85. We also clarified or simplified 34 items, by making minor changes to the words, based on the comments of the panel and discussions in the research group. After deleting the items, the second version of the scale, -*HealthRDR* 0.2- consisted of 163 items (Table 3).

Table 4. Content validity based on experts´ evaluations before/after item removals

Sub-scales and scale	Items (n)	CVI variance	S-CVI¶	CVR variance	S-CVR¶
Health choices	28/25	0.63-0.98/ 0.63-0.98	0.87/0.87	0.29-0.91/ 0.29-0.91	0.72/0.76
Rights	41/41	0.77-1/0.77-1	0.94/0.94	0.51-1/0.51-1	0.87/0.87
Duties	48/47	0.75-1/0.75-1	0.93/0.94	0.55-1/0.55-1	0.86/0.87
Responsibilities	51/50	0.69-1/0.82-1	0.94/0.94	0.37-1/0.37-1	0.87/0.88
HealthRDR	168/163	0.63-1/0.63-1	0.92/0.93	0.29-1/0.29-1	0.84/0.85

¶S-CVI and S-CVR were calculated by means for the CVIs and CVRs

Phase 3: Preliminary testing

The respondents were 15 and 16 years old, 74 were girls (37%), 70 were boys (35%) and 56 (28%) did not want to state their sex. The majority of the respondents (72%) said their mother tongue was Finnish.

The full range of item responses was used and the items had adequate variance (standard deviation 0.608-1.810). The mean values ranged from 1.9 to 4.7 on a five-point scale. The Cronbach´s alpha coefficient for the whole scale was 0.99 and ranged from 0.86 to 0.99 for the sub-scales (Table 5). The corrected item to total correlations were 0.10-0.91. Fifteen items were deleted with item-to-total correlations ranging from 0.10 to 0.32. After these were removed, Cronbach´s alpha for the whole scale was 0.99 and for the sub-scales it ranged between 0.93-0.99. Based on the results of the preliminary testing, 15 items were deleted, resulting in 148 items. This created the third version of the scale, called *HealthRDR* 0.3 for the purposes of this study. This will be renamed as version 1.0 now that the scale has been developed and pre-tested.

Table 5. Crobach´s alpha before and after items were removed

Sub-scales and scale	Items (n)	Cronbach´s alpha F[i]	I[ii]	Total
Health choices	25/15	0.86/0.89	0.89/0.90	0.92/0.93
Rights	41/36	0.93/0.95	0.94/0.96	0.96/0.97
Duties	47/47	0.96/0.96	0.97/0.97	0.98/0.98
Responsibilities	50/50	0.98/0.98	0.99/0.99	0.99/0.99
HealthRDR-scale	163/148	0.98/0.98	0.98/0.98	0.99/0.99

F[i] fulfilment, I[ii] importance

Discussion

This study described the development and preliminary testing of the *HealthRDR*- scale. The final scale consisted of four sub-scales comprising 148 items: health choices, rights, duties and responsibilities. According to the evaluations by the panel, the items represented good content validity and clarity. Based on the preliminary testing, the Cronbach´s alpha coefficients were moderate.

Operationalization of adolescents´ rights, duties and responsibilities in relation to their health choices

Putting abstract and ethical concepts into practice is complex, because they cannot be directly observed and several methods may need to be used to define their meaning[43]. In addition, although rights, duties and responsibilities are independent concepts[5,65], the adolescents have found it difficult to separate duties and responsibilities in practice[13]. The concepts have often been used as synonyms in everyday life and their usage has overlapped in previous literature[10,15,20]. The *HealthRDR*- scale also represents a conceptual overlap of duties and responsibilities. The complexity of the concepts may explain, why rights, duties and responsibilities in relation to their health choices have not been operationalized earlier. Because the adolescents have found it challenging to separate them from each other, this may have also influenced their responses to the scale. In future, we need to consider to what extent and level duties and responsibilities related to adolescents´ health choices overlap and whether it is necessary to separate duties and responsibilities in practice, although theoretically these concepts are separate.

Items on the *HealthRDR* 1.0 -scale were developed based on previous literature to cover all aspects of adolescents´ rights, duties and responsibilities in relation to their health choices[46,47]. All items were positively worded to strengthen their validity and reliability by decreasing measurement errors. The content validity of the scale was strengthened by following a systematic instrument development process and using a variety of data sets to construct the initial items. In addition, 23 people on our expert panel, including adolescents, assessed the content validity of the items[55], to strengthen the content validity assessments and to increase the relevance of the scale for the target population[51,66]. However, it is worth noting that expert assessments of the content validity of items is always subjective[51], which is why the final decisions on removing and revising items were made, based on the conceptual understanding from literature and after discussions in the research group[46].

Assessing the reliability of *HealthRDR*-scale

The final version of the -*HealthRDR* 1.0 -scale was constructed by following the systematic development process. In addition, decisions to exclude items in different scale development phases were made to emphasize the statistical results. However, this resulted in high values for Cronbach´s alpha coefficient in the preliminary testing and figures over 0.9 may indicate that there were some unnecessary items[46], especially within the sub-scales of responsibilities and duties, as discussed in previous sections. This confirmed the finding that the operationalization of duties and responsibilities should be re-evaluated, in order to revise any redundant items. The number of items could also have increased the values of Cronbach´s alpha coefficient, which may explain the high values we observed[46]. In addition, the length of the scale may have affected the reliability of respondents´ answers, because they could have become tired or distracted[47].

The trustworthiness of the responses was improved by highlighting the fact that participants volunteered to take part. We used two recruitment methods for the

preliminary testing, because recruiting adolescents electronically only provided 19 responses. To improve the response rate, the study was presented to adolescents by electronic messages and through face-to-face contact by a researcher or school teacher. The combination of Internet-based and personalized recruitment methods has been shown to improve participation among adolescents[67,68].

Future considerations and development of the *HealthRDR*-scale

Although, the *HealthRDR*-scale was developed to measure adolescents´ perceptions, it could also be tested and modified for other age groups. However, there is evidently a need to shorten the length of the scale. As indicated by our results, the definitions of the concepts need re-evaluating, using different theoretical or empirical methods. After that, further studies are required, that use various statistical methods, to find out whether items could be removed from the scale and which items they should be. These methods demand large sample sizes, ideally 10 participants per item, to ensure the reliability of the tests[46,47,54]. Additional reliability testing is required before the scale can be used to examine adolescents´ perceptions of their rights, duties and responsibilities in relation to their health choices. In addition, diverse recruitment methods and retention strategies should be considered for future testing of the scale as identified in previous studies with adolescents[68,69]. The *HealthRDR*-scale is not presented as a whole in this paper, in order to avoid the different versions to be used in further studies.

Adolescents are heterogeneous group with large global variations in relation to their age and opportunities to make health choices. Thus, validating the scale is critical if we are to determine the variations in adolescents´ perceptions about their health choices and their rights, duties and responsibilities. This knowledge is needed for the development of interventions and health promotion activities to support adolescents to achieve and fulfill their rights, duties and responsibilities in relation to their health choices.

Conclusion

The *HealthRDR*-scale is needed to examine adolescents´ rights, duties and responsibilities in relation to their health choices and to understand the ethical basis when it comes to making choices about this age group. In addition, the scale is essential if we are to provide further clarification of these ethical concepts, in order to strengthen the conceptual basis of health sciences. The new scale has potential for further development. However, additional studies are needed to test the reliability and validity of it and to analyze the constructs of adolescents´ rights, duties and responsibilities in relation to their health choices.

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Declaration of conflicting interests

The authors have no conflict of interest to declare.

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