Master's Thesis

Availability of high-quality health information for children and teenagers

A research within the project "Health Literacy & Diversity for Secondary Students in year 1 (HeLi-D)"

Submitted by

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To obtain the degree

Master of Public Health (MPH)

at the

Medical University of Graz,

Postgraduate Master's Programme in Public Health

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Gefördert aus den Mitteln des Fonds Gesundes Österreich

Vasoldsberg, 26.06.2019

Abstract

Background and aim of the thesis

The results of a study on the health literacy of Austrian 15-year-olds show the necessity to promote health literacy amongst teenagers. Within the context of the current project HeLi-D ("Health Literacy and Diversity for Secondary Students in year 1") this research sought and qualitatively assessed the available national and international health information for children and teenagers.

Methods

The search for health information targeted directly at children and teenagers in English and German, was conducted through a focused online search and by contacting experts, health professionals and institutions specialising in health care for children and teenagers. Subsequently, all of the found items meeting the content criteria were evaluated using all of the questions of the quality assessment tool "Ensuring Quality Information for Patients (EQIP)" relevant to the target groups.

Results

Approximately half of the 38 found items, which met the content criteria, are written in English and the other half in German. About 75% are targeted at teenagers. Around 40% deal with physical health issues and approximately 60% with primarily mental. The results of the evaluation with EQIP 36 show a varying degree of quality, with final scores ranging from 51% to 82% of the maximum score of 100%. When investigating the individual chapters of the assessment tool, the results generally indicate the largest deficiencies in the content-related composition and the biggest strengths in the structure of the health information. The intention is for the found items to be integrated in the HeLi-D project.

Conclusion

The number of found items exceeded the expectations. Yet, the results of the assessment with EQIP 36 show room for improvement concerning the quality. The outcome of the project points out the necessity to develop further health information for children and teenagers on a wider range of topics in order to foster health literacy at an early age.

Zusammenfassung

Hintergrund und Fragestellung

Die Ergebnisse einer Jugendstudie zeigen eine Notwendigkeit der Verbesserung der Gesundheitskompetenz bei 15-Jährigen in Österreich auf. Daher soll im Rahmen des laufenden Projekts „Health-Literacy und Diversity für SchülerInnen der Sekundarstufe 1 - HeLi-D“ auch die Verfügbarkeit von internationalen und nationalen Gesundheitsinformationen, die sich direkt an Kinder und Jugendliche richten, identifiziert und die Qualität der gefundenen Materialien bewertet werden.

Methoden

Die Suche nach deutsch- und englischsprachigen Gesundheitsinformationen für Kinder und Jugendliche wurde anhand einer fokussierten Internetrecherche und der Kontaktaufnahme mit FachexpertInnen, health professionals und Institutionen, die auf die gesundheitliche Betreuung von Kindern beziehungsweise Jugendlichen spezialisiert sind, durchgeführt. Die Gesundheitsinformationen wurden nachfolgend anhand aller für Kinder beziehungsweise Jugendliche relevanten Fragen des Qualitätsbewertungsinstruments „Ensuring Quality Information for Patients (EQIP)“ bewertet.

Ergebnisse

Es konnten insgesamt 38 unterschiedliche Gesundheitsinformationen eingeschlossen werden, davon waren jeweils rund die Hälfte in deutscher bzw. englischer Sprache verfasst. Rund 75% richten sich an Jugendliche. Thematisch behandeln etwa 40% primär somatische und rund 60% primär psychische Erkrankungen. Die Ergebnisse der Evaluation weisen mit einem EQIP 36-Score von 51% bis 82% von maximal erreichbaren 100% eine große Reichweite hinsichtlich ihrer Qualität auf, wobei bei Aufschlüsselung der Kapitel von EQIP 36, generell die größten Defizite im inhaltlichen und die Stärken im strukturellen Aufbau liegen. Die Ergebnisse sollen in das Projekt Heli-D integriert werden.

Schlussfolgerung

Es konnten wesentlich mehr Gesundheitsinformationen für Kinder und Jugendliche als erwartet identifiziert werden, wobei die Bewertung jedoch auf ein Verbesserungspotential hinsichtlich der Qualität hinweist. Es zeigt sich auch die Notwendigkeit der Erstellung weiterer Gesundheitsinformationen für die junge Zielgruppe zu weiteren Themen um deren Gesundheitskompetenz bereits im frühen Alter fördern zu können.

Statement under oath

I hereby declare that the work presented in this thesis was completely done by me and that I have not used any sources or help other than those explicitly mentioned.

Vasoldsberg, 26.06.2019

Acknowledgment

Many different people contributed to this project, but the by far biggest contribution was made by my husband. Without his efforts and help – from technical support, proofreading and encouragement – I would have never completed this thesis.

A big thank you goes out to my colleagues at the Institute of General Practice and Evidence-based Health Services Research at the Medical University of Graz.
First, I want to sincerely thank Sarah Burgmann for spending a lot of time helping with the quality assessment and content issues.
I also give great gratitude to Thomas Semlitsch for his assistance during the entire process, especially the focused search for health information, and to Nicole Posch for her help and expertise concerning the quality assessment, as well as content and organizational issues throughout the project.
I also thank Kerstin Wratschko for her help with the statistics and the quality assessment tool.

Of course, I would like to take this opportunity to sincerely thank my supervisors Andrea Siebenhofer-Kroitzsch and Barbara Gasteiger-Klicpera for their expert support and the guidance of my master's thesis.

Index

Index of figures

Index of tables

1 Introduction

1.1 Definition of and emphasis on health literacy

Even though the concept of health literacy being important for a person's health is increasingly gaining awareness and acceptance, it was difficult to establish a unified definition for the term "health literacy". The first definition was developed by the World Health Organization in 1998, which defines health literacy as *(1)*:

"The cognitive and social skills which determine the motivation and ability of individuals to gain access to understand and use information in ways which promote and maintain good health."

A definition established by Sorensen et al. in the year 2012 through the integration of 17 previous definitions of health literacy resulted in the following *(1)*:

"Health literacy is linked to literacy and entails people's knowledge, motivation and competences to access, understand, appraise, and apply health information in order to make judgments and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life course."

As can be seen in *Figure 1: Integrated model of health literacy (1)*, the four types of competences *(Access, Understand, Appraise* and *Apply*) described in the integrated model, empowers individuals to operate within the following three different settings (1):

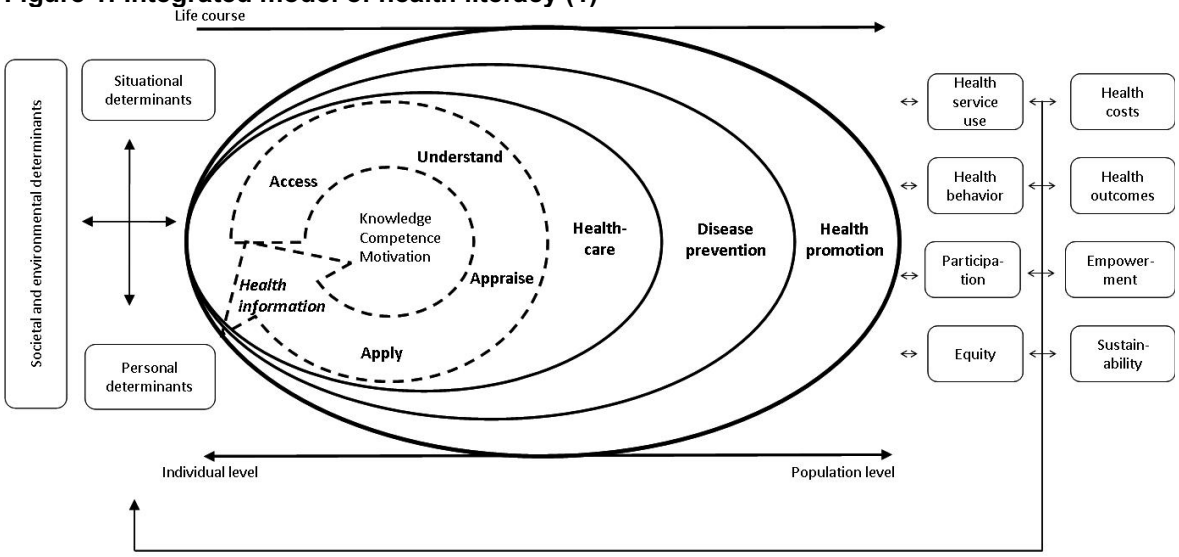
1. the healthcare sector (as a patient)
2. the field of disease prevention (as a person being at risk of disease)
3. the domain of health promotion (as a citizen)

Target number three of the Austrian health targets, which were developed in 2010, aims *"to enhance health literacy in the population"*, for example, by the facilitation of available, easy to understand, high-quality health

information. The importance of the enhancement of health literacy across all population groups is also underlined (2).

Furthermore, the promotion of health literacy amongst the population, by focussing on information and communication, was declared a strategic aim in the target control contract of the Styrian governement ("Landes-Zielsteuerungsvertrag"), which they concluded in 2013 with the statutory health insurance agencies (3).

Figure 1: Integrated model of health literacy (1)



1.2 Health literacy of children and teenagers

Health literacy has started to gain importance over the last years and is seen as an important health determinant, which has lead to an increasing focus on health literacy in children and teenagers (4).

The conclusion of a systematic review, published in 2014, identifies the lack of studies on measures promoting children to actively take part in healthy decision making. It also emphasizes the need for further studies on this subject (5).

In 2012, the Europe Health Literacy Survey concluded, that the adult Austrian population showed a low level of health literacy, when compared to other European countries. Low health literacy correlates with for example a lower socioeconomic status and a lower education level. It is

also associated with poor health and an increased use of health care services (6).

Within a subsequent study, the health literacy of 15-year-old teenagers was tested. More than half of the teenagers showed limited health literacy in the fields of disease management, prevention and health promotion. These results show the need to promote and therefore strengthen health literacy amongst the Austrian youth (7) and to ensure the young people's right to access of appropriate health information, that is easy for them to understand (8).

There are quite a few health promotion campaigns targeted at children and teenagers in Austria. Most of these measures take place in schools and cover basic health promotion topics like for example exercise, nutrition, mental health and prevention of addiction (4).

The early promotion of health literacy starting at an early age in childhood and adolescence is considered particularly significant due to the sustainability of these actions (9). Basic processes, fundamental to the development of skills and behaviours influencing a person's health, already start during childhood. Therefore, influences during these early years of life have a great impact on an adult's health. Health literacy can be described as a life-long learning process, from a person's early years to adulthood. When research on health literacy in children started to come to the fore, it primarily focused on the way the parent's health literacy influenced their children's health. Only later was the emphasis placed on health literacy for children and younger people through school health education and health promotion (10).

A systematic review, published in 2017, concluded that definitions and models on health literacy for children and young people are very diverse. Health literacy can be seen as a *"multidimensional complex construct"* and an "*action competence, with a strong focus on personal attributes, while also recognising its interrelatedness with social and contextual determinants."* When considering different age groups, the different stages of cognitive functioning and development are incorporated, but specific needs, social factors and vulnerabilities are often not reflected and included. Compared to definitions and models for older children, teenagers

and secondary school students, there were only few items found for children younger than ten years of age and primary school students (10).

1.3 Health information

One strategy to strengthen health literacy amongst a population is to provide written health information that is easy to understand (11).
Since patients need different kinds of information, from organizational to medical aspects, the term “patient information” is used very heterogeneously. In 2006, a manual was generated, explaining how to generate high-quality patient information on health topics. Patient information should enable patients to understand an illness and its symptoms better and inform them about the benefits, risks, and medical side effects. It should also alert them about ineffectual, redundant, and harmful interventions. They should be based on the most relevant treatment objectives for patients, like for example life expectancy and the improvement of their quality of life. Emphasis is also placed on the importance of evidence-based content in health information. Individuals have different demands concerning health information – from understanding the aetiology of a disease and getting details on treatment options to learning how to contribute to their recovery and prevent a relapse. In addition to medical aspects, patient information should also include other patients’ experiences describing the influence of their disease and treatment on their quality of life and other aspects like for example their mental health. As it is Impossible to include all of these issues and details in every piece of health information, it is essential to research the needs of the target group, before the preparation of health information. The defined target group and the aim of the health information should also be mentioned at the beginning of the document. Patient information should include objective and reliable information, that is easy to understand (12).
In 2015, the second version of “Gute Praxis Gesundheitsinformationen” (“Good Practice Health Information”) was published. It elaborated on the basic criteria for high-quality health information concerning comprehensibility, transparency and requirements of the content. It also assists authors and publishers of evidence-based health information in its

preparation, to create information that is easy to understand and takes into account the competences of the according target group. Health information was defined as information dealing with the following aspects (13):

- the basic knowledge on health, illness, its consequences, and development
- prevention and health promotion
- early diagnosis, diagnostics, therapy, palliation, rehabilitation and follow-up care of illnesses and associated medical decisions
- care
- coping with everyday life and disease

Health information can be used in many different situations and formats and can be written for very different target groups. Evidence-based health information enables people to expand their knowledge on health topics and diseases. Therefore, it helps them make (joint) decisions that are appropriate for their individual values, attitudes towards life and individual situation (13).
Different assessment tools for health information have also been developed and validated with the aim to evaluate the quality of health information (14, 15).

1.4 The study's objective and research question

Due to the reasons described in the chapters above, fostering health literacy amongst the young population should become a focus of experts in the field of health.

To the project team's knowledge, no (present) study had yet been done, researching the existing health information for this target group without a restriction to certain topics and a subsequent quality assessment.

The aim of this study is to provide an overview of the available, high-quality health information for children and teenagers in an effort to promote health literacy amongst this target group. This was explored through the following research question:

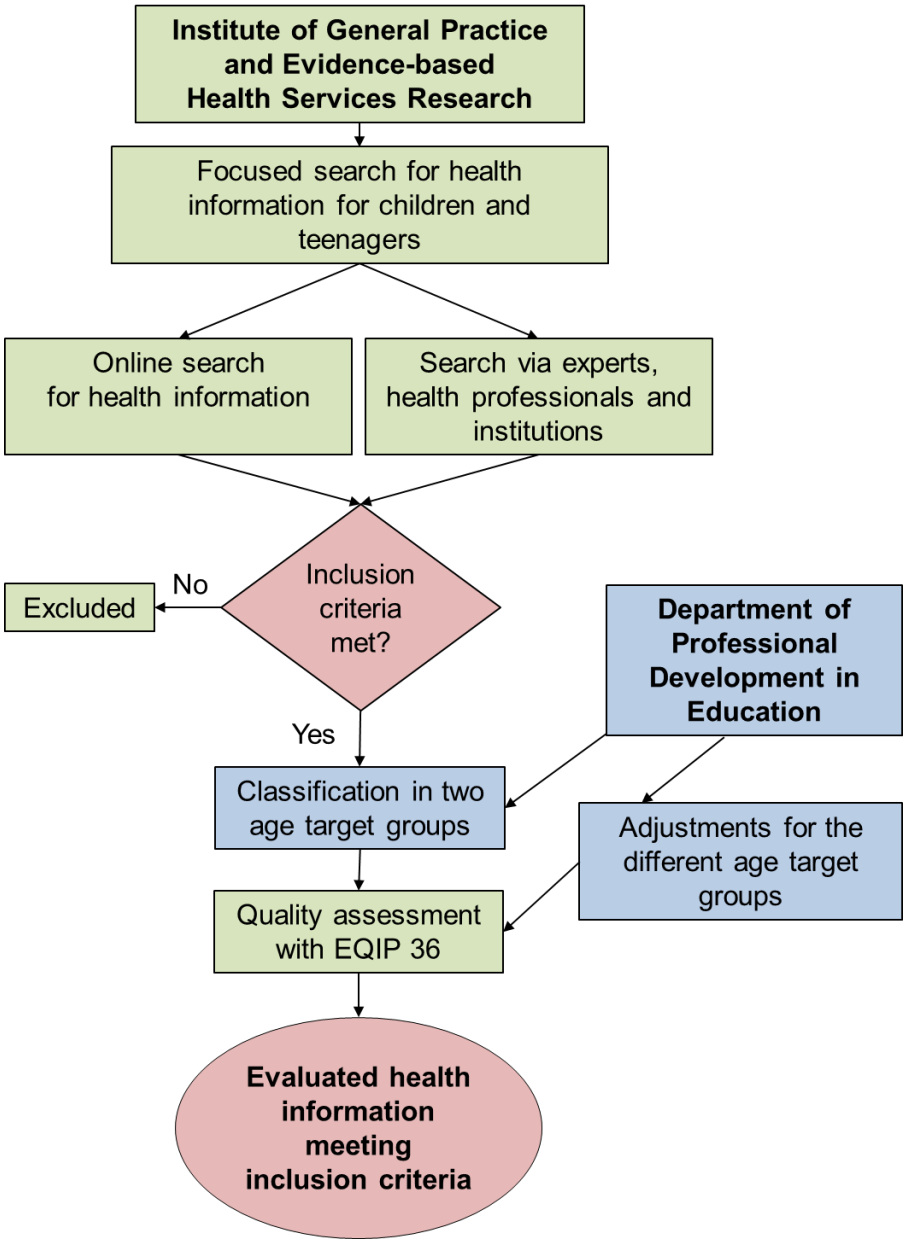
What high-quality health information for children and teenagers is available in German and English?

The research question combines two of the ten Austrian health targets developed in 2010. First, the study targets the health of children and teenagers, therefore meeting target number six: "*To ensure conditions under which children and young people can grow up as healthy as possible*". Furthermore, the project addresses target number three: "*To enhance health literacy in the population*" by promoting health literacy through high-quality, independent, and comprehensible health information (2).

2 Methods

In this chapter, the different steps of the research on health information are described, including the criteria for inclusion. First the focused search for health information for children and teenagers was performed. This was followed by a quality assessment of the found health information. An overview of the procedure of the project is presented in *Figure 2: Procedure of the project*.

Figure 2: Procedure of the project



2.1 Criteria for inclusion of health information

Before starting with the search, the criteria for inclusion of health information were defined as follows:

- Currentness: The health information must not be dated before 2013. If the date of publication is not mentioned in the document, the creation date found in the metadata of the document was used.
- Format: The information must be available as a PDF file without containing any weblinks integrated in the text.
- Target group: The health information must declare that it is addressed directly at children or teenagers, and not at their parents, teachers, or other attachment figures. Cases were also included in which children or teenagers are obviously the target group, due to for example format or design (e.g. comics).
- Topic: There are no limitations concerning the topic, so long as the document is about a specific disease or group of illnesses (e.g. mental illness) including the definition, aetiology, symptoms, diagnosis, therapy, epidemiology, prognosis or prevention.
- Availability: The document must be available for free and without the need for registration.

2.2 Focused search for health information

The search for health information meeting the content criteria was conducted through two different approaches – an internet search and asking health professionals, experts and institutions that specialise in health care for children and teenagers. All of the health information received by 31st December, 2018 were taken into consideration. The basic version of the document sent via letter or e-mail can be found in the Appendix (*Appendix 2: Basic version of the document sent via letter or e-mail to health professionals*).

2.2.1 Search for health information via health professionals, experts and institutions

The aim was to reach as many different professionals working in the field of children's health as possible. Therefore, experts in the field of health information, physicians and institutions working in prevention and

promotion of children's health were contacted via e-mail or by mail. The focus was placed on experts and professionals in Graz and the rest of Styria. However, institutions and experts from other parts of Austria or foreign countries were contacted, if their work field and expertise seemed promising for helping this project.

2.2.1.1 Search for health information via health professionals

A list of paediatricians working in private practice in Graz was generated by combining the list of the Austrian Medical Association and the list of the Austrian Society for Paediatric Medicine, which can both be found online, as of July 2018 (16, 17). Paediatricians known to be retired or not working in private practice (in Graz) anymore were excluded, leaving 21 paediatricians to be contacted. Three paediatricians' offices were visited during their opening hours and the available leaflets were looked through, but no suitable health information meeting our inclusion criteria were found. Therefore, the remaining 18 paediatricians were contacted via mail for efficiency reasons. The same letter was deposited at each of the visited offices' reception for the paediatricians.

Additionally, the societies and hospitals or clinics listed in *Table 1: Contacted societies/hospitals/clinics within the search for health information for children and teenagers* were contacted and asked to distribute the request for health information for children and teenagers amongst their members and staff.

Table 1: Contacted societies/hospitals/clinics within the search for health information for children and teenagers

Society/Hospital/Clinic in German	Association/Hospital translated in English or description
Societies	
ÖGKJ – Österreichische Gesellschaft für Kinder- & Jugendheilkunde	Austrian Society for Paediatric Medicine
ÖGKJCH – Österreichische Gesellschaft für Kinder- & Jugendchirurgie	Austrian Society for Paediatric and Adolescent Surgery
ÖGKJP – Österreichische Gesellschaft für Kinder- & Jugendpsychiatrie, Psychosomatik & Psychotherapie	Austrian Society for Child and Adolescent Psychiatry, Psychosomatics & Psychotherapy
Hospitals/Clinics	
Landeskrankenhaus (LKH) Graz, Universitätsklinik für Kinder- und Jugendheilkunde	Regional Hospital Graz, University Clinic for Paediatrics and Adolescent Medicine
Landeskrankenhaus (LKH) Hochsteiermark, Standort Leoben, Abteilung für Kinder und Jugendliche	Regional Hospital Upper Styria at Leoben, Department for Children and Adolescents
Landeskrankenhaus (LKH) Graz, Universitätsklinik für Kinderchirurgie	Regional Hospital Graz, University Clinic for Children's Surgery
Landeskrankenhaus (LKH) GRAZ II, Abteilung für Kinder- und Jugend-psychiatrie und - psychotherapie (KJP)	Regional Hospital Graz II, Department for Child and Adolescent Psychiatry and Psychotherapy

2.2.1.2 Search for health information via experts

Seven experts, in the field of health information, from Germany, Norway, Canada, and Australia were contacted personally via e-mail and asked for their expertise. Amongst other fields, they work in evidence-based medicine, informed health choices, public health, medicine, community health, educational research and health education.

2.2.1.3 Search for health information via institutions

During a brainstorming session within the team, a list of institutions was developed, that was complemented through a focused online research and input from the contacted institutions themselves.

The institutions that work within the fields of health information and children's health and education were contacted via e-mail and asked to distribute the request for health information for children and teenagers amongst their members and staff.

In *Table 2: Contacted institutions within the search for health information for children and teenagers*, the 60 contacted institutions (taking into account the individually contacted centres of networks explicitly mentioned, but excluding the three contacted teachers) are listed and divided into three groups to ensure a better overview. Obviously the categories may overlap.

Table 2: Contacted institutions within the search for health information for children and teenagers

Institution in German	Institution translated in English or description
Health promotion, prevention & health literacy	
ÖPGK – Österreichische Plattform Gesundheitskompetenz	Austrian Platform Health Literacy
GIVE – Servicestelle für Gesundheitsförderung an Österreichs Schulen	Service Centre for Health Promotion in Austrian Schools
Styria vitalis	NPO with different projects in the field of health promotion and prevention in Styria
LOGO Jugendmanagment gmbh	Special department offering information services for youth among other things
Österreichische Jugendinfos	Austrian information service for youth
Feel-ok.at	Webpage containing health information for teenagers on many different topics
Schulzahnambulatorien Graz (three locations)	Three outpatient clinics in Graz offering dental health education for children
Vivid – Fachtstelle für Suchtprävention	Special department for addiction prevention
Österreichische Arbeitsgemeinschaft Suchtvorbeugung	Austrian Working Group for Addiction Prevention
ÖGF – Die Österreichische Gesellschaft für Familienplanung	Austrian Association for Family Planning
Health services for persons affected	
Österreichische Kinderkrebshilfe	Austrian Children's Cancer Charity
Österreichische Krebshilfe: Mama/Papa hat Krebs	Austrian Cancer Aid: Mum/Dad has cancer
Selbsthilfe Steiermark	Service point for support groups in Styria
Rauchfrei Telefon	Service providing help in smoking cessation.
147 Rat auf Draht	Emergency number for children, teenagers and their attachment figures with problems or in crisis
Zebra – Interkulturelles Beratungs- und Therapiezentren	Intercultural Advisory and Therapy Centre
OMEGA – Transkulturelles Zentrum für psychische und physische Gesundheit und Integration	Transcultural Centre for Mental and Physical Health and Integration
PSZ – Psychosoziale Zentren GmbH	Psychosocial Centres
Drogenberatung des Landes Steiermark	Centre for Drug Counselling of the Styrian Government
Suchtprävention Steiermark	Drug Prevention Styria

aks Gesundheit: Kiesel – Präventionsangebot für Kinder und Eltern mit seelischen Leiden	Prevention program for children and parents with mental problems
WEIL – Weiter im Leben	Helpline for young people until the age of 25 who are suicidal, incl. friends and family
IFP – Institut für Familienberatung und Psychotherapie	Institute for Family Counselling and Psychotherapy
Verrückte-Kindheit.at (HPE Österreich)	Consulting services for children of mentally ill parents
Verrückt? Na und! (Irrsinnig menschlich e.V.)	Project promoting mental health in children and teenagers
KIPKE – Beratung von Kindern psychisch kranker Eltern (Caritas St. Pölten)	Counselling for Children of Mentally Ill Parents
Verein JOJO Kindheit im Schatten	Prevention program for children of mentally ill parents
IKJF – Institut für Kind, Jugend und Familie	Institute for Children, Youth and Family (Psychology)
Kinder- und Jugendtherapiezentrum Graz Hilmgasse	Child and Youth Therapy Centre in Graz, Hilmgasse
Heilpädagogische Station des Landes Steiermark	Ward for Therapeutic Paedagogy of the Styrian Government
Netzwerk der steirischen ZWEI UND MEHR-Eltern-Kind-Zentren (11 Zentren)	Network of the 11 Styrian parent-child centres
Rettet das Kind Steiermark	Styrian children's aid organization
Schulpsychologische Beratungsstelle Steirischer Zentralraum	School Psychological Advisory Centre of Central Styria
Pro mente Steiermark	Mental health Styria
Frauengesundheitszentrum Graz	Women's Health Centre Graz
Netzwerk steirischer Frauen- und Mädchenberatungsstellen (10 ausgewählte Zentren)	Selection (10 centres) of the network of Styrian counselling centres for women and girls
Others	
Steiermärkische Gebietskrankenkasse (GKK), Abteilung Gesundheitsförderung & Public Health	Styrian Medical Insurance Institution, Department for Health Promotion & Public Health
Österreichisches Jugendrotkreuz	Austrian Youth Red Cross
IQWIG – Institut für Qualität und Wirtschaftlichkeit im Gesundheitswesen	Institute for Quality and Efficiency in Health Care
Three teachers from three different schools working with students of different age groups were asked if they know about any health information for children or teenagers.	

2.2.2 Online search for health information

The online search for health information for children and teenagers was conducted in August and September 2019 with the search engine Google. First, the search terms were defined, obviously trying to cover many different approaches to find as many documents dealing with health information meeting the inclusion criteria as possible.

Through brainstorming and sample searches, 40 search terms were defined in German and 45 terms in English, which are all listed in *Table 3: Search terms of the online search for health information for children and teenagers*.

Different synonyms for health information were used for each search, like for example the terms “patient information”, “health information”, and “health care information”.

It was assured within the scope of the sample searches that, when performing a search with for example the term “info”, it would also contain search hits with other variations of the term, e.g. “information”. If quotation marks were used in the phrase, then this tactic could not be applied. Thus, all different versions of the term had to be searched for individually. For the search in German, the distinction between singular and plural was additionally considered in this case.

In both languages, different expressions for children and teenagers were included, as well as different wordings and phrases. For example, different prepositions indicating the target group of the information were included. Additionally, phrases indirectly indicating the age target group were included in the search, like for example the term “appropriate for children”. To avoid search hits containing health information on children’s health addressed towards parents and other attachment figures, many phrases were searched in quotation marks in order to only get results containing those exact phrases.

Table 3: Search terms of the online search for health information for children and teenagers

German search terms (n=40)	English search terms (n=45)
"Gesundheitsinfo für Kinder" "Gesundheitsinformation für Kinder" "Gesundheitsinformationen für Kinder" "Patienteninfo für Kinder" "Patienteninformation für Kinder" "Patienteninformationen für Kinder"	"patient info for children" "patient information for children" "health info for children" "health information for children" health care "info for children" health care "information for children"
"Gesundheitsinfo für Kids" "Gesundheitsinformation für Kids" "Gesundheitsinformationen für Kids" "Patienteninfo für Kids" "Patienteninformation für Kids" "Patienteninformationen für Kids"	"patient info for kids" "patient information for kids" "health info for kids" "health information for kids" health care "info for kids" health care "information for kids"
"Gesundheitsinfo für Jugendliche" "Gesundheitsinformation für Jugendliche" "Gesundheitsinformationen für Jugendliche" "Patienteninfo für Jugendliche" "Patienteninformation für Jugendliche" "Patienteninformationen für Jugendliche"	"patient info for adolescents" "patient information for adolescents" "health info for adolescents" "health information for adolescents" health care "info for adolescents" health care "information for adolescents"
"Gesundheitsinfo für Teenager" "Gesundheitsinformation für Teenager" "Gesundheitsinformationen für Teenager" "Patienteninfo für Teenager" "Patienteninformation für Teenager" "Patienteninformationen für Teenager"	"patient info for teenagers" "patient information for teenagers" "health info for teenagers" "health information for teenagers" health care "info for teenagers" health care "information for teenagers"
Gesundheitsinfo "an Kinder" Patienteninfo "an Kinder" Gesundheitsinfo "an Jugendliche" Patienteninfo "an Jugendliche" Gesundheitsinfo "an Teenager" Patienteninfo "an Teenager" Gesundheitsinfo "an Kids" Patienteninfo "an Kids"	"patient info for juveniles" "patient information for juveniles" "health info for juveniles" "health information for juveniles" health care "info for juveniles" health care "information for juveniles" "patient info for young people" "patient information for young people" "health info for young people" "health information for young people" health care "info for young people" health care "information for young people"

Gesundheitsinfo altersgerecht Patienteninfo altersgerecht Gesundheitsinfo altersentsprechend Patienteninfo altersentsprechend Gesundheitsinfo kindgerecht Patienteninfo kindgerecht Gesundheitsinfo kindergerecht Patienteninfo kindergerecht	patient info "appropriate for children" health info "appropriate for children" health care info "appropriate for children" patient info "suitable for children" health info "suitable for children" health care info "suitable for children" patient info age-based health info age-based health care info age-based

Using the tools of the Google search engine only results within the last five years were included (2013-2018). Additionally, the creation date was verified for each found item, as provided by the author specified on the document. If there were no details on the creation date provided by the author, the date indicated within the metadata of the PDF file was used. The first 20 search hits of each query were examined and checked for any health information meeting the inclusion criteria.

A new user profile was created for the project, and, after each query of a search term, the cookies and the browsing history were deleted. Through this procedure, it was assured that previous searches did not influence future queries with the other search terms.

2.3 Quality assessment of the found health information

This section describes the procedure of the quality assessment of all of the found health information for both age target groups using the *Ensuring Quality Information for Patients* instrument (EQIP) and the instrument itself.

2.3.1 The *Ensuring Quality Information for Patients* (EQIP) instrument

The quality assessment tool EQIP 20 (15) was designed to be used by health care professionals and patient information managers for all types of health information. It was validated in a paediatric setting and comprises 20 questions, with the goal of evaluating, amongst other things the aims of the health information, language, structure, identification data, stating of other sources of information, alternatives, risks and side effects of medical measures.

The existing EQIP 20 was expanded and advanced by 16 questions to EQIP 36 (18) (see Appendix: *Appendix 1: EQIP 36 scale*) and structured into the three chapters: content, structure, and identification data.
At the beginning of each evaluation, basic properties of the health information are indicated. These include the title, the publisher, the year of publication, the size and the category of information.
One or more categories of information, from the following list that was predefined in EQIP, can be assigned:

- Services
- Discharge or after care
- Condition or illness
- Test, operation, investigation or procedure
- Medication or product
- Miscellaneous

Chapter 1: Content (18 items)

The first chapter covers questions on the aim of the health information and the description of the medical problem and different treatment alternatives, as well as purposes, benefits, risks and side effects of the medical intervention, if it was attained. Furthermore, it addresses the quality of life issues, complications, precautions and alert signs that the patient may detect. Cost and insurance issues and further sources of information are also covered.

Chapter 2: Identification data (6 items)

The second chapter addresses the date of issue or revision, the depiction of the logo of the issuing body, the name of the publisher and of the financers, and the presence of a bibliography. It also asks if the document states any information about if patients were involved in the production of the health information and if so how they were involved.

Chapter 3: Structure (12 items)

The third chapter covers questions on the language, ambiguities or contradictions, the balance between risks and benefits, and addresses if

the information is presented in a logical order. Layout including figures and graphs, the presence of a named space for the reader's notes, and a consent form within the same document are also covered.

Calculation of the EQIP-Score

For every question, the evaluator may choose between four different response options: "yes", "partly", "no" or "does not apply".
For the evaluation of the rating, "yes" counts for 1 point, "partly" for 0.5 points and "no" for zero points.
First, for each chapter, the amount of points is divided by the number of questions. The total result from one evaluation of an item is calculated by dividing the sum of the results for each of the three chapters by three.
If an evaluator chooses the answer "does not apply", the corresponding question is not taken into consideration in the whole calculation – neither in the summation, nor in the division.
Multiplied by 100, the result for the evaluation for the health information is specified in the form of a score from 0 to 100%, zero being the worst and 100% being the best possible result.
The final score for one item is the result of the mean score of the total result from both evaluators.

2.3.2 Classification of the found health information

In order to assess all of the health information, it was necessary to first divide them into two age target groups.
One age target group for health information was defined as teenagers who are 12 years old and older. The other age target group consists of children under the age of 12.
The assignment of each item to one of the age target groups was primarily planned to be carried out by indications given within the health information for which age group it was designed. This may be the case within the title or within the body text.
If no age target group is indicated within a document, Univ.-Prof. Dr. Gasteiger-Klicpera of the Department of Professional Development in Education of the University of Graz, the project manager of the project HeLi-D (19), ("Health-Literacy and Diversity for Secondary Students in

year 1", a project aiming to develop and implement a computer-assisted program to foster Health Literacy in Styrian students aged between 12 and 14 years, considering their diversity) was consulted as an expert in order to assess an age target group by considering for example the language, the design and the images of the documents concerned.

2.3.3 Adjustments for the quality assessment of the health information

Some of the questions of EQIP 36 were adjusted for each age target group, in order to conduct a quality assessment as suitable as possible for the different items. In the course of this step of the project, Univ.-Prof. Dr. Gasteiger-Klicpera was again consulted as an expert.

2.3.3.1 Adjustments for the quality assessment of the health information for teenagers

Question number 6 (Q6), which addresses if the sequence of the medical procedure (prior to intervention, during intervention and post-intervention) is described, was coded as "does not apply" in all documents for teenagers, as it is viewed as being too detailed for this target group.
Question number 15 (Q15), which deals with the medical intervention costs and insurance issues, was defined as "does not apply", as this information is not relevant for teenagers.
Question number 36 (Q36) asks about a consent form being included in the document, contrary to recommendations. As Austrian children under the age of 14 are not allowed to give consent, and teenagers between the age of 14 and 18 are not allowed to give consent under all circumstances, this question was coded as "does not apply" for all health information targeted at teenagers (20, 21).
As some documents are targeted at children of ill parents, it was decided that questions number 12, 13, and 14 (Q12, Q13, and Q14) may apply to both, the parents and the children.
Question number 12 (Q12) addresses the information on how potential complications will be dealt with, question number 13 (Q13) deals with the description of precautions that the patient may take and question number 14 (Q14) asks if alert signs, that the patient may detect were mentioned.

This means that in the rating of all three items, information on both the children's and the parent's perspectives, was considered.

2.3.3.2 Adjustments for the quality assessment of the health information for children

Questions Q6, Q12, Q13, Q14, Q15 and Q36 were handled the same way, as in the group of health information for teenagers, as described in subsection 2.3.3.1.

Questions number 8 and 10 (Q8 and Q10), asking for a description of quantitative benefits of each intervention, and asking for a description of quantitative risks and side-effects of each intervention, respectively, were defined as "does not apply" for all health information for children, as quantitative descriptions in this form cannot be expected to be comprehensible for children at this age.

Question number 16 (Q16), which addresses stated contact details for hospital services, was coded as "does not apply", as it is not relevant for children under the age of 12, because required hospital services are usually contacted by the parents or other attachment figures for children at this age.

In the rating of question number 17 (Q17), which asks for given details for further sources of information and support, apart from hospital services, also considers parents, teachers or other attachment figures for further questioning.

In the case of health information for children in the form of stories, question number 28 (Q28), which asks if the document personally addresses the reader, and question number 35 (Q35), which asks for a named space for the reader's notes, were defined as "does not apply". Addressing the reader personally is not possible in the case of storytelling, and a named space for the reader's notes is considered not relevant for this type of health information.

2.3.4 Preliminary measures to avoid bias within the quality assessment

Preliminary measures were taken in order to avoid systematic bias within the evaluation of the found health information.

First, the two independent evaluators received detailed instructions on how to use EQIP 36 for evaluating health information from an experienced team member and a colleague who had already used EQIP 36 for another project.
Second, one piece of health information from each age target group was evaluated through EQIP 36 by the two evaluators and the experienced team member. The three results of each item were compared with concern for potential extreme deviation, due to a misunderstanding of one of the questions of the tool by one of the evaluators in the form of a systematic bias.
There was no critical divergence in the results, but newly raised questions were discussed and clarified within the team.

3 Results

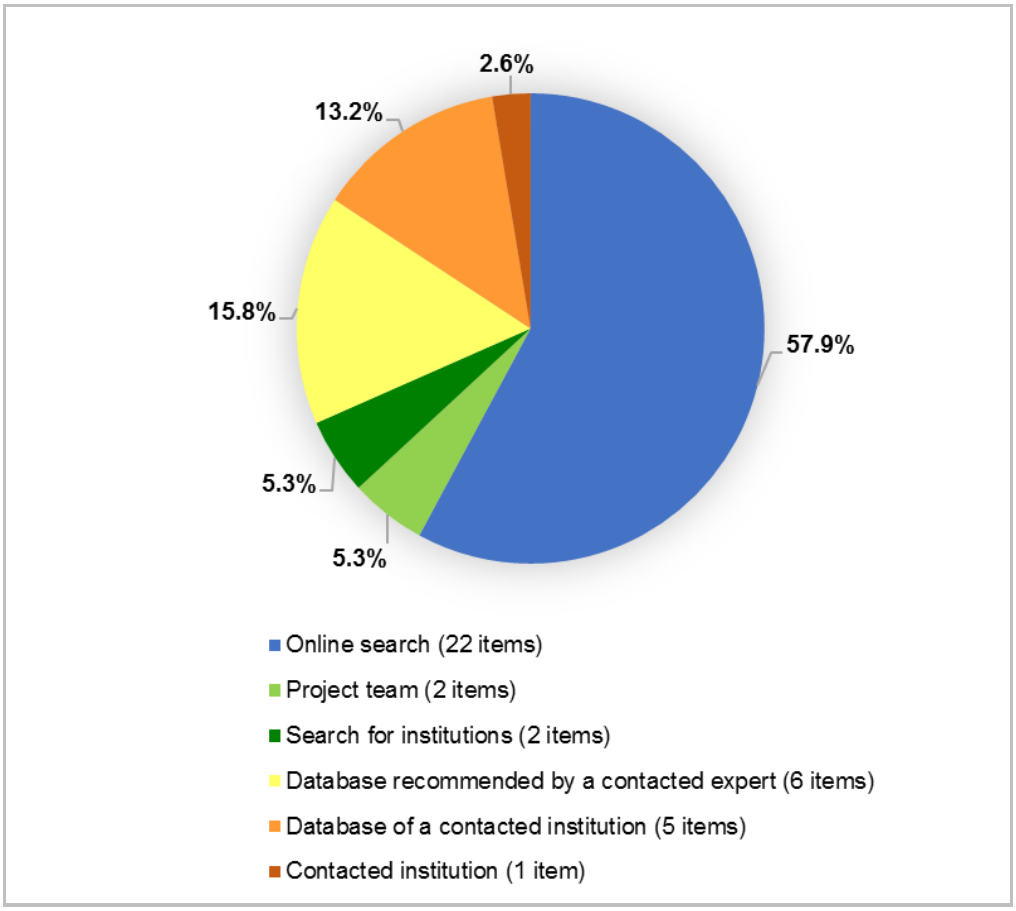
In this chapter, first the results of the search for health information for children and teenagers are described, including how the items were found. The different groups of health information, according to the age target group, are described, including the special cases with overlapping age target groups and the adjustments in the evaluation in these cases. Additionally to the number, language and form of the documents, selected aspects of the content of the health information are described.
Finally, the results of the quality assessment with EQIP 36 are presented. In *Table 4: Found health information for teenagers, Table 5: Found health information for children*, and *Table 6: Found health information with overlapping age target groups*, the found documents are listed including their title, date, author or publisher and the final score of the evaluation with EQIP 36. In the appendix a more detailed table, additionally containing the explanation of the assigned age target group of each health information and the approach of the focused search through which the item was found (see *Appendix 3: Details on the found items*), and a table with the detailed results of the evaluation (the results of each chapter of EQIP 36 and the final score, see *Appendix 4: Detailed results of the evaluation of the found items*), can be found.

3.1 How the items meeting the inclusion criteria were found

As described in section 2.2, two different approaches were used for the focused search for health information for children and teenagers. The internet was searched using the search engine Google. On the other hand, health professionals, experts, and institutions working in the field of children's health were contacted and asked for input.

From the total 38 found items on health information, 22 were found through the online search, six were found through a database recommended by a contacted expert, five were found through the database of a contacted institution, two were already known within the team, two were found within the search for institutions who were contacted (but not through the institutions themselves), and one was found through a contacted institution. The proportionate distribution can be seen in *Figure 3: How the health information meeting the inclusion criteria were found (n=38)*.

Figure 3: How the health information meeting the inclusion criteria were found (n=38)



3.1.1 Returns of the contacted health professionals

Of the paediatricians working in private practice in Graz contacted via mail (see subsection 2.2.1.1), none replied to our request. One letter came back due to a new address outside of Graz.

Five of the seven contacted societies and clinics (see *Table 1: Contacted societies/hospitals/clinics within the search for health information for children and teenagers*) responded to our request and agreed to try to distribute it within their community. Additionally, one document was suggested as a health information for our project, but did not meet our inclusion criteria. One society and one clinic did not reply to our e-mail.

3.1.2 Returns of the contacted experts

All seven of the contacted experts, on health information and associated fields of work (see subsection 2.2.1.2), responded to the request for health information for children and teenagers. Apart from their personal expertise, they referred to three other experts and project managers, who might be able to give valuable input to our project and were all contacted additionally.

As a result, two databases were recommended, from which one produced six pieces of health information meeting our inclusion criteria and one item of health information was brought forward but did not meet our inclusion criteria.

3.1.3 Returns of the contacted institutions

Details on the search within the institutions and all contacted institutions can be found in subsection 2.2.1.3.

Of the 60 contacted institutions, 18 did respond to our request. Also, all three contacted teachers replied, but could not contribute any information on health information for students. We also received an error message that our e-mail could not be sent to the e-mail address of two contacted institutions. The remaining 40 institutions did not respond to our request.

Of the 18 contacted institutions who replied to our request, seven responded that they were not aware of any health information for teenagers or children.

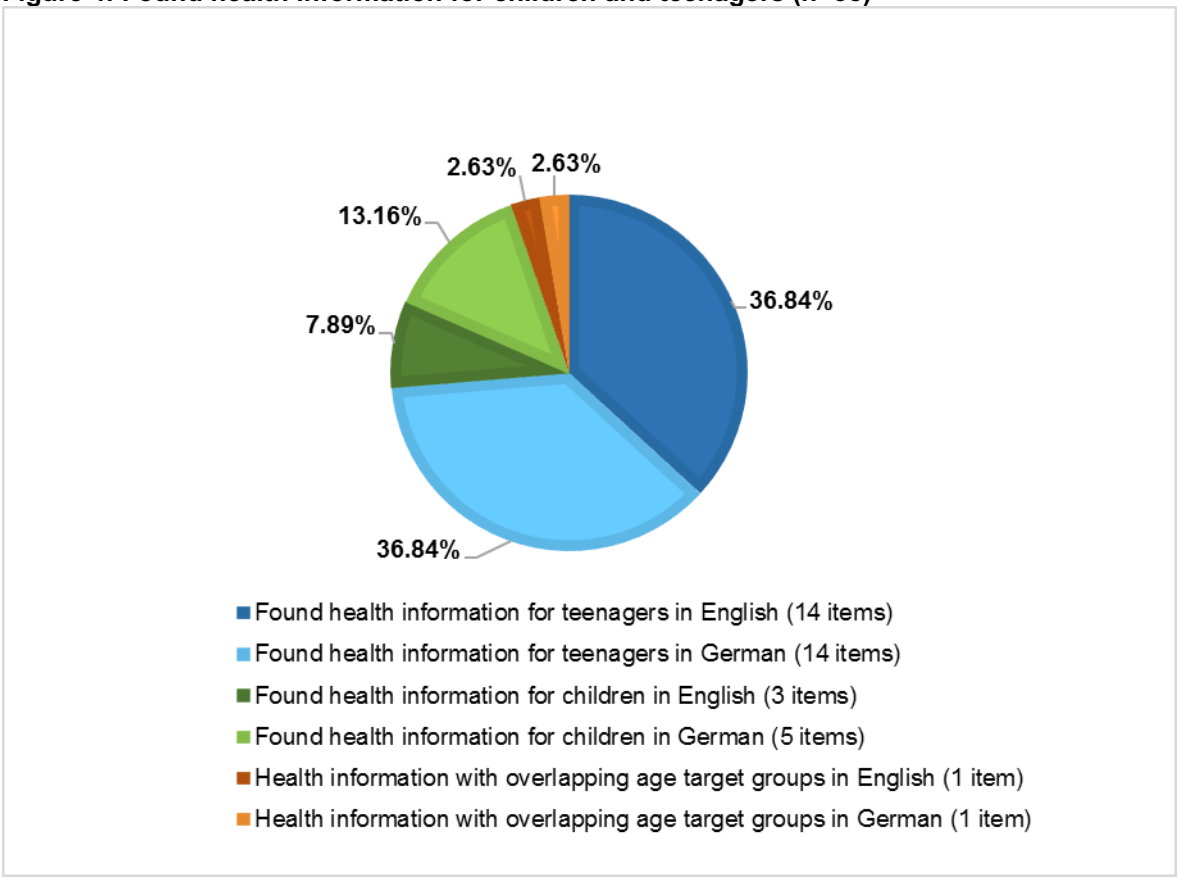
Of the remaining 11 contacted institutions, four did not want to provide their health information for our project (for details see subsection 4.1.1).

The remaining seven contacted institutions contributed two known items and six new documents meeting the inclusion criteria (five items found through a link to the database of the institution). Six of the remaining seven institutions also provided health information not meeting our inclusion criteria.

3.2 Found health information for children and teenagers

The found documents dealing with health information were categorized into the two defined age target groups. Two items could not be assigned to one of the defined groups and were, therefore, handled as special cases and treated individually in the course of the quality assessment.
The proportionate distribution of the found health information is represented in *Figure 4: Found health information for children and teenagers (n=38*).
Of the 38 found items meeting the inclusion criteria 28 items are targeted directly at teenagers 12 years old and older, representing nearly three quarters of all found health information. In this category, 14 English and 14 German documents were found.
To the target age group of children under the age of 12 years, eight items were assigned, representing over a fifth of the found health information. Three English and five German items were assigned to this category.
The two items, one written in English and German each, classified as special cases as the target groups were overlapping the two predefined age target groups, represent by far the smallest part of the found health information.
Based on all 28 items, the language of the found documents is almost equally balanced, with 18 items written in English, and 20 items written in German.
Details on the classifications of the age target groups of the individual items, the handling of the presence of multiple versions of health information, the forms of the health information and the special cases with overlapping age target groups, can be found in subsections 3.2.1, 3.2.2, and 3.2.3.

Figure 4: Found health information for children and teenagers (n=38)



3.2.1 Found health information for teenagers

A total of 28 items were assigned to this age target group, 14 written in English and 14 written in German language.

In most cases, teenagers being the target group was indicated within the health information, for example, in the title (e.g. “Information for youth”) or references to this age group were made within the body text. In one case information on the age target group was given on the homepage of the campaign. Only in five of the 28 cases, was it necessary to decide on an age target group with the help of Univ.-Prof. Dr. Gasteiger-Klicpera who took into consideration its design and the language.

Two of the German documents were available in a long and a short version. Only the long versions were evaluated with EQIP 36, and the long and the short versions are counted as one piece of health information in the course of this project.

Concerning the form of the health information, two of the items in this target group were composed as comics in English. The rest were

classically designed pieces of health information in the form of a document structured in different chapters.

An overview of all found health information for teenagers, including the final scores of the evaluation, are listed in *Table 4: Found health information for teenagers.*

3.2.2 Found health information for children

Of the eight found items on health information for children, three were written in English, and five were written in German.

Only in half of the eight cases was the target group mentioned in the title or the body text of the health information. But even if the age target group was not indicated within the health information, then the layout and language indicated the addressed age group as children under the age of 12 years.

One English document for children is available in two different versions. One version deals with the child's situation when the mother must be treated in the hospital as an inpatient. In the other version the father falls ill and must be treated. However, both versions cover the same issues and messages for the children. Only one version was evaluated with EQIP 36 and both versions together were counted as one health information within this project.

In this age target group, three of the documents were composed in the form of stories. Two of them were written in German and one in English.

An overview of all of the found health information for children, including the final scores of the evaluation, is listed in *Table 5: Found health information for children*.

3.2.3 Found health information with overlapping age target groups

Two of the found pieces of health information could not be assigned to one of the defined age target groups, one written in English and one in German.

The age groups targeted in these two special cases overlap the two defined age groups. One of them is item number 3.1 "Cystic Fibros*is here for schools*" (Cystic Fibrosis Trust, 2016) which is written in English and targeted at the classmates and teachers of children affected by Cystic

Fibrosis. In this case, the target group, therefore, practically has no clear age limit and the health information is suitable for children from the age of 10 years onwards, in regard to language and layout.
The second item, number 3.2, is written in German and offers information for girls on dysmenorrhea (IQWIG, 2016). As it addresses girls before and during puberty, the target group was defined as beginning at 10 years old and, therefore, overlapping within the two age target groups of this project. Both items are designed like classical health information documents.
These two documents, including the final score of the evaluation, are listed in *Table 6: Found health information with overlapping age target groups*.

3.2.3.1 Adjustments for the quality assessment of the two documents with overlapping age target groups

When evaluating both special cases, questions Q6, Q15, and Q36 were handled the same as in the group of health information for teenagers, as described in subsections 2.3.3.1.
Questions Q8 and Q10 were dealt with in the same way as in the group of health information for children, as described in subsections 2.3.3.2.
Question Q16, dealing with stated contact details for hospital services, was coded as “does not apply” in the course of the evaluation of health information number 3.1. “Cystic Fibros*is here for schools*” (Cystic Fibrosis Trust, 2016), as it is not relevant for the classmates or teachers of affected students.
Again, Univ.-Prof. Dr. Gasteiger-Klicpera was consulted as an expert in this work step.

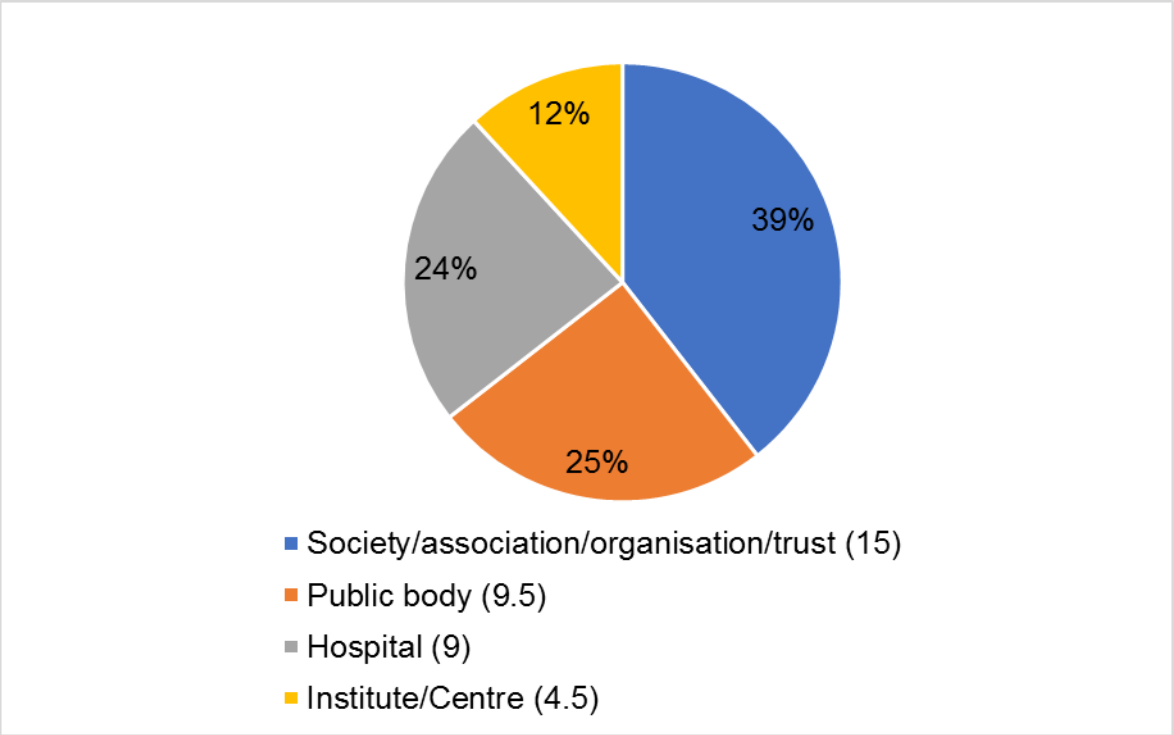
3.3 Description of the authors of the found health information

The authors or publishers of the found items meeting the content criteria were assigned to the following four categories:

1. Societies, associations, organisations and trusts
2. Public bodies
3. Hospitals
4. Institutes and centres

When two authors were declared for one piece of health information, each of the two was counted as 0.5, in order to reach the sum of 38 authors for 38 items. Through this approach, the distribution of the contribution of each author is taken into account for the comparative presentation of the four different categories in *Figure 5: Distribution of the four categories of the authors/publishers of the found health information*.

Figure 5: Distribution of the four categories of the authors/publishers of the found health information



The first category (Societies, associations, organisations and trusts) accounts for the greatest share, with more than one third of the authored items. Public bodies and hospitals each make up about a quarter, and institutes and centres make up approximately an eighth of the authored items.

It must be considered that there are a few authors who published more than one item of health information. The first category (Societies, associations, organisations and trusts) consists of 12 different authors. The second category includes five different public bodies. The third category is made up of only two hospitals, and the third category holds three different institutes and centres.

3.4 Description of the content of the found health information

In the following three subsections of this section, selected details on the content of the found health information for children and teenagers are described.

3.4.1 The topics of the found health information

As there was no limitation concerning the topic of the health information, as long as it covers aspects of a certain illness or group of illnesses (for details see section 2.1), there is a wide range of different themes covered by the found items.

Despite, the biopsychosocial model demonstrating that health and illness should be seen as a consequence of biological, psychological and social factors combined (22), the different items of this project were divided into primarily physical (e.g. skin and cancerous diseases) and primarily mental health issues (e.g. depression, eating disorders), in order to show an overview over the items' topics. Items dealing with substances causing addiction, like tobacco or alcohol, were assigned to the group of items addressing topics of mental health. Due to the comparatively small amount of found health information for children and the items with overlapping age target groups, the found items for all three age target groups were considered altogether, instead of comparing the results of the different age target groups separately.

As can be seen in *Figure 6: Distribution of the topics of the found health information (n=38)*, more than 60% of the found items deal with mental health issues. Going into further detail, they can be distinguished between items about mental health issues covering mental health topics in general and items addressing children with mentally ill parents. The aim, of five of the 18 items dealing with mental health, is to help children of mentally ill parents deal with their mother or father's health issues. By trying to explain the parent's illness in an age-appropriate way, they help children to deal with their situation in a better way. This leaves less than half of all of the found health information, which deals with mental health topics in general,

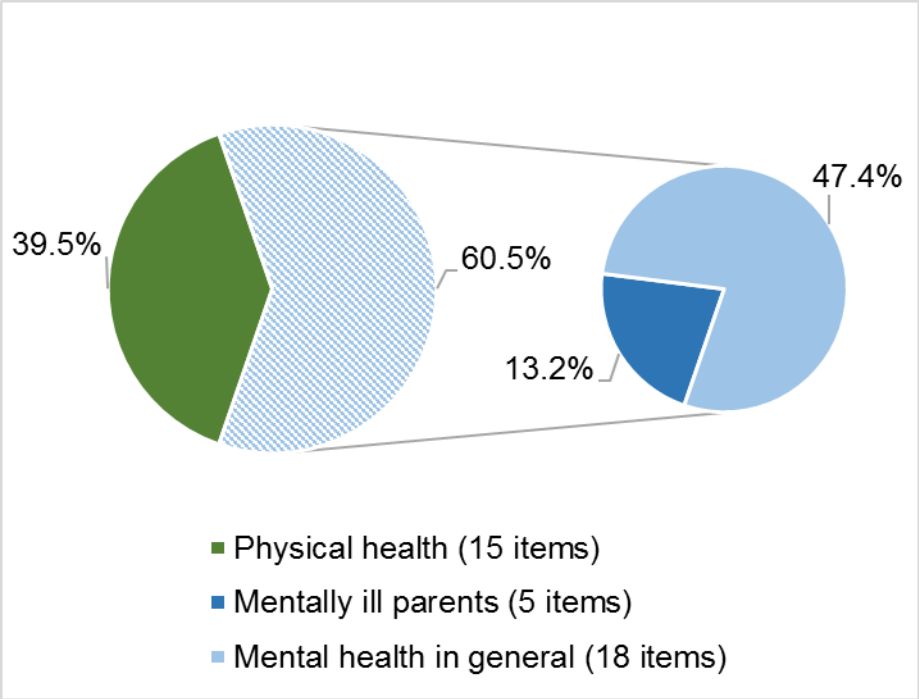
meaning not focusing on mentally ill parents. Nearly 40% of the found items deal with physical health issues.

The found documents for teenagers are distributed equally between both language groups. In both groups, nearly three quarters of the items (10 out of 14 items; 71,4%) deal with mental health issues, of which, one deals with the topic of parents being mentally ill.

The number of items in the group of health information for children is comparatively small. Of the three English documents for children, one deals with physical health. The other two items address the topic of mentally ill parents. Of the five German items for children, four deal with issues on physical health. One item addresses the topic of mentally ill parents.

Both special cases with overlapping age target groups, one in English and one in German, deal with topics of physical health.

Figure 6: Distribution of the topics of the found health information (n=38)



3.4.2 The gender of the target groups of the found health information

The clear majority of the found items address boys and girls in equal measure, as most topics are relevant to boys and girls in the same way.

The title of item number 3.2 dealing with dysmenorrhoea (IQWIG, 2016) indicates the target group as girls.
The two items number 1.16 A and number 1.17 A (Berlin Cancer Society, 2013), deal with the topic of fertility after cancer in teenagers. There are two different versions of the document, one for boys and one for girls, which is indicated in the titles of each.

3.4.3 Aspects of prevention and therapy being covered by the found health information

Nearly all of the found health information includes at least a basic description of the illness being covered by each item, but they may differ in further covered aspects. Some health information, for example, concentrates on the possible treatment options of an illness, while others primarily discuss methods of prevention.
At this point, it must be mentioned that the title or introduction of some documents indicates an initial focus on other aspects than the treatment of a health issue. Therefore, not all of the health information can be criticized for a lack of information, if it does not cover the treatment options of the topic.
In this subsection, it is not considered how detailed the information on therapy and prevention is described. It is only stated if any information on the aspect is given in the document, without further specification on the level of detail, completeness, or correctness.

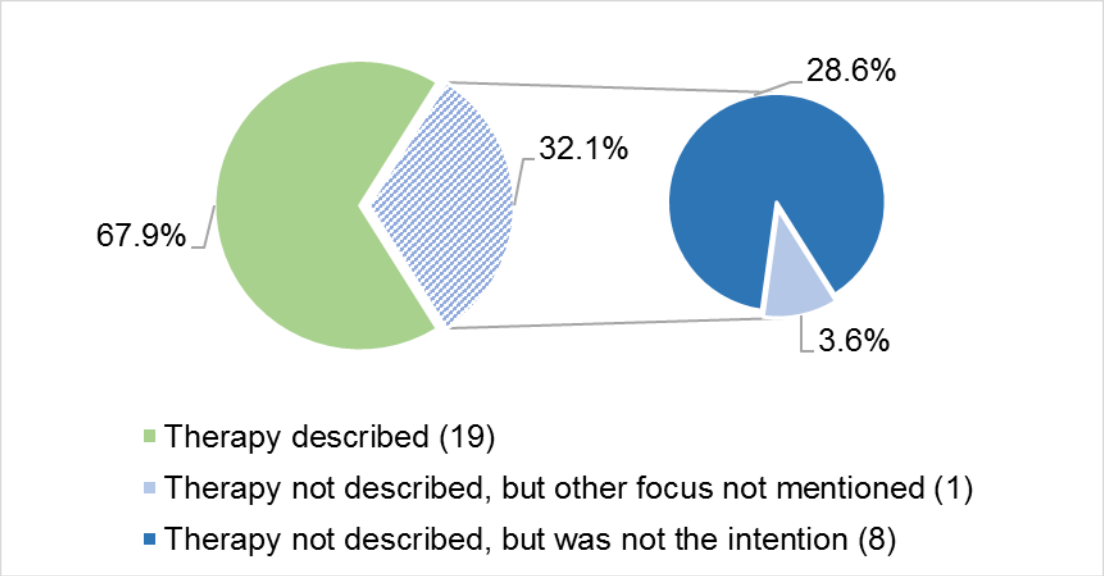
3.4.3.1 Aspects of prevention and therapy being covered by the found health information for teenagers

Figure 7: Aspects on therapy being covered in health information for teenagers (n=28) shows the distribution of the aspects prevention and therapy being covered in the group of health information for teenagers. More than two thirds of the health information for teenagers covers the treatment of the described health topic to some degree. This leaves about one third without any information on therapy. But from these nine items not discussing treatment options, eight indicated concentrating on a different aspect, for example prevention, within the title or introduction of the health information. Only one of the documents in this group did not include any

information on treatment possibilities even though the reader would get the impression that it would.

All but one item in this category covered aspects on prevention to some extent.

Figure 7: Aspects on therapy being covered in health information for teenagers (n=28)



3.4.3.2 Aspects of prevention and therapy being covered by the found health information for children and by the two special cases

The results of the chapter of EQIP 36, evaluating the quality of the content of the health information, can only be interpreted in a limited manner (for details see subsection 4.1.2).

Three of the eight found items for children described treatment options to some extent. The other five items do not include information on the therapy of the health issue covered by the health information. Six of the eight items in this group deal with the topic of prevention to some degree, and two items include information on both aspects.

The two items with overlapping age target groups (special cases) both cover aspects on prevention and treatment options.

3.5 Results of the evaluation of the found health information

In this section, the results of the quality assessment of all found health information meeting the inclusion criteria are presented. First, the evaluation results of the health information for children and those for teenagers are described individually. Then, at the end of the section, an overview over the results of all found items, including the two special cases with overlapping age target groups, is given.
The final score values are described and followed by the results of each of the three chapters of the quality assessment tool EQIP 36. Therefore, for each item, the mean value of each chapter from the two independent evaluators was calculated. The mean values of each chapter for all 38 found items meeting the content criteria and each group of health information for the two different age target groups were also calculated.

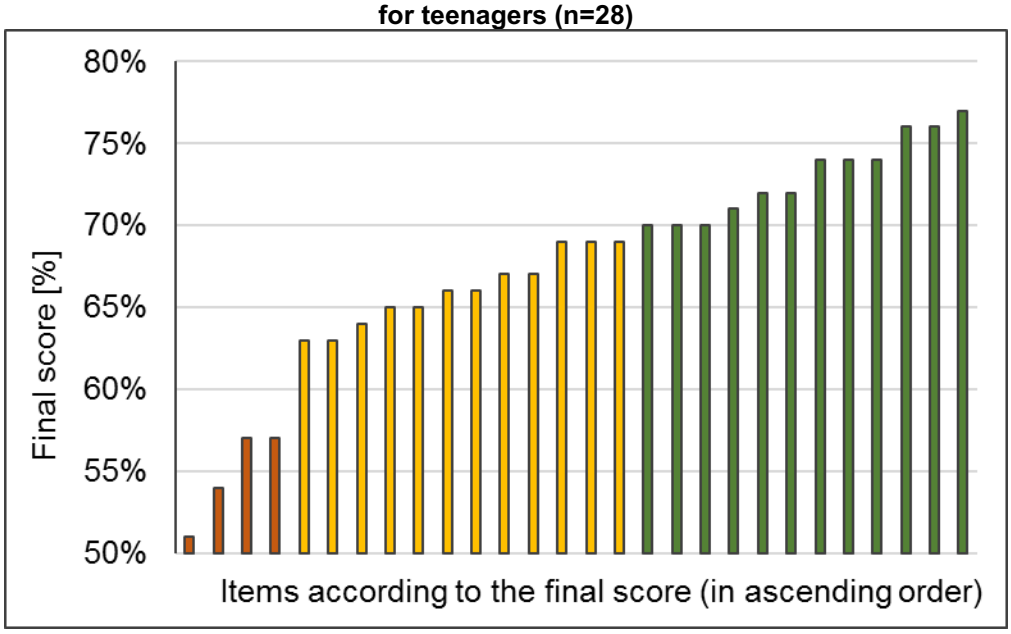
3.5.1 Results of the evaluation of the found health information for teenagers

The final score values, of all of the items in the group of health information for teenagers, range from 51% to 77%, with a mean value of 67% and no single outliers. This can be seen in *Table 4: Found health information for teenagers*.
In *Figure 8: Graphic representation of the final scores of the found health information for teenagers (n=28)*, the distribution of the results can be seen as the items are sorted by their final scores in ascending order.
The final score values were divided into three categories. As there are no final score values below 50%, the first category (highlighted in red) contains all values from 50% to 59% and consists of four items. The second category (highlighted in yellow) includes all items with values between 60% and 69%, and the third category contains values from 70% to 79%, as there are no items with a higher score. The second and the third categories consist of 12 items each.
The first category, representing the items with the lowest final score, is by far the smallest category, with the smallest amount of items. A notable detail is the gap between the first and the second category, with a

prominent jump from 57% to 63%. The transition from the second to the third category is a much smoother one.

The highest score in this group was reached by item number 1.5 “Depression - Information for youth” (CHEO, 2013) with a final score of 77%. Item number 1.24, on influenza vaccination (German Federal Centre for Health Education (BZgA), 2015), received the lowest final score in this group, with 51%. This is also the lowest final score of all 38 found pieces of health information meeting the inclusion criteria.

Figure 8: Graphic representation of the final scores of the found health information for teenagers (n=28)



The mean values of the three different chapters of all found items for teenagers are:

- Content: 57%
- Identification: 68%
- Structure 77%

Table 4: Found health information for teenagers[1]

Nr.	Title (Date)	Author/Publisher	Score
English			
1.1	A guide for teenagers with eczema Live your life (2017)	The National Eczema Society	0.74
1.2	Ask A Scientist: How Do People Become Infected With Germs? (2017)	Centres for Disease Control and Prevention, U.S. Department of Health and Human Services	0.57
1.3	Ask A Scientist: How Does My Body Fight Disease (2017)		0.57
1.4	Coping with thoughts of suicide - Information for youth (2014)	CHEO - Children's Hospital of Eastern Ontario	0.72
1.5	Depression - Information for youth (2013)		0.77
1.6	Eating Disorders - Information for youth (2014)		0.70
1.7	OCD: Obsessive Compulsive Disorder - Information for youth (2015)		0.72
1.8	Psychosis - Information for youth (2015)		0.67
1.9	Self-Harm - Information for youth (2015)		0.64
1.10	Social Anxiety - Information for youth (2014)		0.67
1.11	Mental Health and Mental Illness - Information for youth (2014)		0.66
1.12	Questions about mental health? (2014)	Rethink Mental Illness	0.69
1.13	My parent is in hospital - Information for older children and teenagers (2018)	South London and Maudsley NHS Foundation Trust	0.70
1.14	Life's simple 7 for Kids 7 Simple Ways to Live Better! (2013)	American Heart Association / Heart Fund	0.74
German *[English translation/description]*			
1.15	Schlafstörungen (2017) *[Sleeping disorders]*	IQWIG - Institute for Quality and Efficiency in Health Care	0,69
1.16 A	Luzie möchte einmal Mutter werden Eine Informationsbroschüre für jugendliche Patientinnen mit einer Krebserkrankung (2013) *[Information on fertility for teenage girls suffering from cancer]*	Berliner Krebsgesellschaft e. V. *[Berlin Cancer Society]*	0.76
1.16 B	Short version of 1.16 A: Fruchtbarkeit nach Chemo- und Strahlentherapie bei Mädchen (2016)		-

[1] Further details can be found in the appendix.

1.17 A	Mischa möchte einmal Vater werden Eine Informationsbroschüre für jugendliche Partienten mit einer Krebserkrankung (2013) *[Information on fertility for teenage girls suffering from cancer]*		0.74
1.17 B	Short version of 1.17 A: Fruchtbarkeit nach Chemo- und Strahlentherapie bei Jungen (2016)		-
1.18	Mama geht's heut' nicht so gut Wenn Eltern psychisch krank sind (2016) *[Information for teenagers with mentally ill parents]*	Kinder- und Jugendanwaltschaft (kija) Salzburg *[Children's and youth advocacy of Salzburg]*	0.70
1.19	pocket-info: Alkohol Informationsbroschüre für junge Menschen (2013) *[Alcohol]*	Institut für Suchtprävention (SP) der Sucht- und Drogenkoordination Wien gemeinnützige GmbH (SDW) & wienXtra-jugendinfo *[Institute for Addiction Prevention of the Addiction and Drug Coordination Vienna & the organisation wienXtra]*	0.76
1.20	pocket-info: Cannabis Informationsbroschüre für junge Menschen (2016) *[Cannabis]*		0.71
1.21	pocket-info: Tabak Informationsbroschüre für junge Menschen (2014) *[Tobacco]*		0.69
1.22	Selbstverletzendes Verhalten Die schnelle Info für junge Leute (2017) *[Self-harming behaviours]*	Verein wienXtra, in Kooperation mit der MA 13-Fachbereich Jugend *[Organisation wienXtra, in cooperation with the magistrale department 13 (youth), Vienna]*	0.66
1.23	Wege aus der Essstörung Zurück zum Genuss (2016) *[Eating disorders]*	Amt der Oö. Landesregierung, Direktion Bildung und Gesellschaft, Gruppe Jugend, JugendService *[Office of the Government of Upper Austria, Department of Education and Society]*	0.65
1.24	Infos zum Impfen Kleiner Piks mit großer Wirkung (2015) *[Influenza vaccination]*	BZgA - Bundeszentrale für gesundheitliche Aufklärung *[German Federal Centre for Health Education]*	0.51
1.25	Rauchfrei durchs Leben Rauchfrei leicht(er) gemacht (2017) *[Non-Smoking]*		0.63
1.26	Schluss mit Rauchen Rauchfrei leicht(er) gemacht (2016) *[Smoking cessation]*		0.63

1.27	Vorsicht Wasserpfeife (2017) *[Water pipe]*		0.54
1.28	Sicher durch die Nacht Infos zum Umgang mit Alkohol und Tipps für Notfälle (2017) *[Alcohol, including attitude to alcohol and emergencies]*		0.65

3.5.2 Results of the evaluation of the found health information for children

The final score values in the group of health information for children, range from 62% to 82%, with a mean value of 71%. The highest score of 82% is also a single outlier. The highest final score, of this group of health information, was reached by item number 2.6, which deals with the topic of UV protection (CMMC and Clinic for Dermatology and Venerology, University Clinic Cologne, 2017). This is also the highest final score of all of the 38 found pieces of health information that meet the inclusion criteria. The two items with the lowest score of 62% in this group of health information are items number 2.7, which deals with dental health (Styria vitalis, 2015), and 2.4, which is about sun protection (German Cancer Aid & working group Dermatological Prevention, 2014). Then, the values jump to a score of 68% to 71%. After a second gap the three highest evaluated items range from 75% to 82%.

The mean values of the three different chapters of all found items for children are:

- Content: 53%
- Identification: 70%
- Structure 90%

Table 5: Found health information for children[2][3]

Nr.	Title (Date)	Author/Publisher	Score
English			
2.1	All about stroke: Information for children (2017)	Stroke Association	0.78
2.2	My parent is in hospital Information for children aged 7-11 with a parent in a mental health hospital (2018)	South London and Maudsley NHS Foundation Trust	0.75
2.3 A	Sally Bear's Daddy Is In Hospital A story for children aged 3-6 to be read with an adult (2018)		0.69
2.3 B	Second version of 2.3 A: Sammy Bear's Mummy Is In Hospital A story for children aged 3-6 to be read with an adult (2018)		-
German			
2.4	Clown Zitzewitz und der Sonnenschutz (2014) *[Story about sun protection]*	Deutsche Krebsilfe e.v. & Arbeitsgemeinschaft Dermatologische Prävention e.V. *[German Cancer Aid & working group Dermatological Prevention]*	0.62
2.5	Die Sonne und Wir - Sonnencreme Richtig eincremen mit Anna und Max (2017) *[Sunscreen]*	Zentrum für Molekulare Medizin Köln (ZMMK), Universität zu Köln & Klinik für Dermatologie und Venerologie, Uniklinik Köln *[Center for Molecular Medicine Cologne (CMMC), University of Cologne & Clinic for Dermatology and Venerology, University Clinic Cologne]*	0.68
2.6	Unterwegs mit Anna und Max Wir gehen ins Freibad (2017) *[UV protection]*		0.82
2.7	Gesunde Zähne (2015) *[Dental health]*	Styria vitalis	0.62
2.8	Mia, Mats und Moritz… …und ihre Mama, wenn sie wieder trinkt (2017) *[Story for children with an alcoholic mother]*	*DHS - Deutsche Hauptstelle für Suchtfragen e.V. [German Centre for the Control of Drug Abuse]*	0.71

[2] Further details can be found in the appendix.

[3] The interpretation of the total score of the evaluation of the found health information for children is difficult and therefore only partially representative, as especially the applicability of the category "content" of EQIP 36 is limited. For details see section *4.1*.

It must be taken into account that the results from the chapter of EQIP 36, which evaluates the quality of the content of the health information, can only be interpreted in a limited manner for the items in this group (for details see subsection 4.1.2).

3.5.3 Overview of the evaluation results of all of the found health information

The final scores of the two special cases with overlapping age target groups can be seen in *Table 6: Found health information with overlapping age target groups*.

The mean value, of all 38 pieces of found health information that meet the inclusion criteria, is 68%. This is only one percent higher than the mean value of the group of health information for teenagers (which consists of 28 items) and three percent lower than the mean value of the group of health information for children (which contains only 8 items).

Considering the mean value of all of the 38 found pieces of health information, the final score of the English health information with overlapping age target groups (item number 3.1 “Cystic Fibros*is here for schools*”, Cystic Fibrosis Trust, 2016), is in the middle range of all items. With 76%, the German health information with overlapping age target groups (item number 3.2 on dysmenorrhea, IQWIG, 2016), reaches the fourth highest final score of all of the found health information, along with three other items.

The lowest final score of all the items was item number 1.24 (German Federal Centre for Health Education (BZgA), 2015), which is targeted at teenagers and deals with the topic of influenza vaccination. It has a final score of 51%. The health information for children number 2.6 on UV protection (CMMC and Clinic for Dermatology and Venerology, University Clinic Cologne, 2017) reached the highest final score of all items with 82%.

Table 6: Found health information with overlapping age target groups[4]

Nr.	Title (Date)	Author/Publisher	Score
3.1	English: Cystic Fibros*is here for schools* (2016)	Cystic Fibrosis Trust	0.64
3.2	German: Regelschmerzen - Infos für Mädchen (2016) *[Information for girls on dysmenorrhoea]*	IQWIG - Institute for Quality and Efficiency in Health Care	0.76

The mean values of the three different chapters of all of the 38 found items meeting the inclusion criteria are:

- Content: 56%
- Identification: 69%
- Structure 80%

In the items for teenagers and in the items for children, the chapter evaluating the structure of the health information received the best results, when looking at the mean value. The mean value of the items for children was ranked higher, with 90%, than that of the items for teenagers, with 77%.
In comparison to the other two chapters in both groups, the content was evaluated worst, when considering the mean value of each group. The health information for teenagers has a slightly better result, with a mean value of 57%, than those for children, with a mean value of 53%.
The identification of the document was evaluated approximately equally in both groups, with a mean value of 68% in the group of health information for teenagers and 70% in the items for children.

The mean value of the two evaluators, for the chapter on the content of all of the 38 found items meeting the inclusion criteria, ranges from 33% (item number 1.27 on water pipes by the German Federal Centre for Health Education, 2017 for teenagers) to 80% (item number 1.19 on alcohol by the Institute for Addiction Prevention of the Addiction and Drug Coordination Vienna & the organisation wienXtra, 2013 for teenagers).
The items with the lowest and the highest scores each represent an outlier at the two ends of the spectrum.

[4] Further details can be found in the appendix.

The range of the mean values of the two evaluators, for the chapter evaluating the identification of all of the 38 found items meeting the inclusion criteria, is 50% to 88%. The item with the highest score is also an outlier (item number 1.5 “Depression – Information for youth”, CHEO, 2013 for teenagers).
The mean value of the two evaluators, for the chapter on the structure of all of the 38 found items meeting the inclusion criteria, ranges from 50% to 100%. Again, the items at the two ends of the spectrum represent outliers. The two items, with a score of 100% in this chapter of the evaluation tool, are item number 2.6, on UV protection by the CMMC and the Clinic for Dermatology and Venerology of the University Clinic Cologne (2017) for children, and item number 2.8, which is a story for children with an alcoholic mother, by the German Centre for the Control of Drug Abuse (2017) for children. The item with the lowest score in this chapter is item number 1.24, on influenza vaccination by the German Federal Centre for Health Education (2015) for teenagers. It represents a notable outlier, as the next higher evaluated item reached 71%.

When comparing the two items with overlapping age target groups with the results for all of the 38 found items meeting the inclusion criteria, it is notable that both special cases received a result above average concerning the content (item number 3.1 “Cystic Fibros*is here for schools*” (Cystic Fibrosis Trust, 2016): 62%, item number 3.2 on dysmenorrhea (IQWIG, 2016): 61%).
The chapter on the identification of the health information received a low score in item number 3.1, with a mean value of the two evaluators of only 54%, whereas item number 3.2 received a score clearly above average, with 83%.
The mean value from both evaluators, for the chapter on the structure of the health information, was slightly lower in item number 3.1, with 78%, and higher in item number 3.2, with 85%.

3.6 Data analysis

Data was analysed using SPSS version 23.0. In order to analyse the interrater reliability of the two evaluators, the intraclass correlation coefficient (ICC) was calculated with corresponding 95% confidence intervals (95% CI). The ICC for the average measure was 0.91 (95% CI: 0,83-0,96).

4 Discussion & Conclusion

The aim of this project was to investigate the availability of health information targeted directly at children and teenagers, and not their parents, teachers or other attachment figures, in German and English and evaluate the quality of the found items meeting the inclusion criteria.

The focused search for health information was carried out through two different approaches: an online search using the search engine Google and by contacting experts, health professionals and institutions working in different fields of education, children's health, and health information. The evaluation of the 38 found items was carried out with the quality assessment tool EQIP 36.

In conclusion, despite the quantitative outcome of the search for health information for children and teenagers, being more successful than expected, especially concerning documents for teenagers which contribute nearly three quarters of the found items, the opportunity to start strengthening health literacy already amongst the younger generation is not yet used to its full possible extent. Therefore, the outcome of the project also shows the necessity to develop further health information for children and teenagers on a wider range of topics.

The language of the found documents is nearly balanced between German and English, and perfectly even in the group of health information for teenagers.

The relationship between items on mental and physical health was nearly balanced. The fraction of items for children of mentally ill parents is remarkable. For details, see subsection 3.4.1.

The results of the evaluation with EQIP 36 show a wide range of quality with final scores from 51% to 82%. Even though no found health information received a score below 50%, there are items with serious

deficiencies, in relation to relatively high-quality items. Nevertheless, the highest score being just above 80% shows room for improvement, even within the highest-ranked found health information.
When comparing the results of the three chapters of the evaluation tool, on content, identification, and structure, the outcomes of the items of the two different age target groups (children under the age of 12 and teenagers 12 years old and older) are very similar. In both groups, the results indicate the largest deficiencies in the content-related composition and the biggest strengths in the structure of the health information. Limitations concerning the interpretation of the results, which needed to be considered, are described in subsection 4.1.2.

4.1 Strengths & limitations

In the following two subsections the strengths and limitations of the two major work stages of the project – the search for health information and its evaluation – are analysed individually.

4.1.1 Strengths and limitations of the search for health information

One strength of the search strategy is the use of the two different approaches to find health information for children and teenagers, as described in section *2.2*. The combination, of the online search and the search through health professionals, experts and institutions working within the field of children's health, attempted to maximise the findings and consider the different possibilities where health information might be developed, used and therefore known.
Obviously, the search cannot be complete and, therefore, not every available item can be found. Also, the online search had to be restricted in some way to ensure a certain level of efficiency. Therefore, compromises had to be accepted. The separate search for items addressed only to girls or boys would go beyond the scope of the project's capacity. The number of hits for every search term being examined, and checked for health information meeting the inclusion criteria, had to be restricted to the first 20, for feasibility reasons. The use of quotation marks within the online search can be seen as a strength and a limitation at the same time. On one hand, this method worked very well when trying to avoid hits with

health information on children's health, but targeted at parents, teachers or other attachment figures. On the other hand, this strategy leads to difficulties when using words with different spelling options (for example "health care" vs. "health-care"). Despite this, this approach may have been a reason for not finding items that would have met the inclusion criteria, but did not contain the exact wording. The use of quotation marks is seen more as a strength, than a limitation in the course of this project, as relatively few hits were lost to health information for the wrong target group. Additionally, more health information was found than expected.
Apart from using the quotation marks, the possibility for restricting the publication date of the displayed search hits within the tools of the search engine Google was used. This was also very helpful in avoiding search hits with items not meeting the content criterion of currentness.
For the queries not to influence each other, an extra user profile was created for the project, and the cookies and the browsing history were deleted after each query of a search term. Therefore, a neutral query for each search term could be ensured.
In conclusion, the online search was, by far, the more efficient and effective approach in the search. There were comparatively few items found via the contacted health professionals, experts, and institutions compared to the online search. Additionally, when considering the returns in relation to the efforts the letters and e-mails required, this approach was much less efficient (for details see section 3.1).
As described in subsection 3.1.3, a difficulty with the search within institutions was, that especially private institutions may not want to provide their chargeable documents, or because the items are materials used within a course and may be wrongly evaluated with lower scores, due to incompleteness.
One limitation, which needs to be mentioned, is the fact that webpages could not be included, due to the use of the quality assessment tool, in spite of teenager's high use of the internet when looking for health information (23).

4.1.2 Strengths and limitations of the quality assessment of the found items meeting the inclusion criteria

The quality assessment tool EQIP 36 being structured in three chapters (described in subsection 2.3.1) allows the breakdown of the final score of the evaluation of each item into the categories content, identification and structure, also including criteria for design and language of the item. Therefore, it is possible to identify reasons for a certain final score of an evaluated item to some degree and to draw a conclusion on the strengths and deficiencies of a group of documents. However, the completeness and the correctness of the content, and the comprehensibility of the entire piece of health information, cannot be evaluated directly by solely using EQIP 36 for quality assessment.

Even though the sample of the evaluated items is rather small, meaningful interpretation of the results is still possible due to the fact that the total scores for each item of the two independent evaluators tended to be quite close to each other (see section 3.6).

The fact that EQIP 36 was designed for evaluating patient information for adults is probably the main limitation of this project. Therefore, the different age target groups of the health information had to be taken into account over the course of the evaluation, by the adjustments described in subsections 2.3.3 and 3.2.3.1. Answering certain questions with “does not apply” individually for the different age target groups of the items, ensured that irrelevant criteria for each age target group would not falsify the result of the evaluation, and give it a lower score. Even though this procedure is a limitation of this project, it is also seen as not only inevitable and reasonable, but as a strength. It takes into account the different requirements of the different age target groups as far as possible.

The chapters of EQIP 36 evaluating the identification and the structure of a document were almost completely applicable to health information for children and teenagers. The questions on the content represented a bigger challenge, as some went into too much detail, or asked about information simply irrelevant or intangible to the age target groups. Particularly, this was the case with the items targeted at children under the age of 12. Additionally, certain items were not structured into the classic

design of health information, but written as stories for children or comics for teenagers. This method is obviously a promising approach to give children an understanding of health topics in an age-appropriate way and present them more tangibly, understandably and interestingly for this age target group. The fact that this makes the evaluation with EQIP 36 more difficult cannot be seen as a limitation of EQIP, as it was originally designed for a different purpose. It also not a fault of this project, as, to the team's knowledge, there is no quality assessment tool designed to evaluate written health information for children and teenagers currently available.

4.2 Perspective

Even though the number of the found items meeting the inclusion criteria exceeded expectations, there is a need for more health information written explicitly for children and teenagers. This will help to promote health amongst the population more effectively, by starting to foster health literacy already in the young generation (8).

There are more topics covered by the found health information than expected, but obviously there is still a lack of health information for children and teenagers on most health topics on mental as well as physical health. There is still room for improvement concerning its quality. Quite a few of the found health information pieces, within this project, considered the different options concerning the design and form of the health information. For example, by setting up the information in the form of a story for children or as a comic for teenagers, it makes it more interesting for the age target group and reaches more children and teenagers. As the structure of the found items was generally evaluated quite highly in comparison to the other aspects, authors of future health information may look at existing health information as an aid for orientation.

The problem is that the innovative form of health information is not considered in any quality assessment tools available, as the tools were designed for evaluating health information for adults and, therefore, do not consider special criteria for a younger age target group. They take into consideration neither the form, the design, content, nor other related

aspects. Therefore, a quality assessment tool for evaluating the quality of health information for children and teenagers, and a guideline for the preparation of high-quality health information for children and teenagers, needs to be established to ensure quality and conclusive evaluation. This should be followed by the production of a large pool of health information for the younger generation.

As described in subsection 4.1.2, the tool EQIP 36 only takes into account the identification, the structure, and certain aspects of the content being covered. It can only rudimentarily evaluate the comprehensibility of health information within the chapter evaluating the structure (e.g. use of short sentences, use of everyday language, presentation in a logical order), especially for a certain age target group. This aspect needs to be considered within the establishment of a new quality assessment tool, or, maybe, a possible expanded EQIP 36 scale for different age target groups. Additionally, focus should be set on the presence of a bibliography, in order to ensure the correctness of the given information to some extent. A further possible criterion, to be integrated in the quality assessment of health information, may be the declaration of an update policy. This is already generally recommended by experts (13), as information on the planned revision of the information was hardly ever mentioned in the found items.

Furthermore it must be said that even though teenagers still tend to seek health information within their social environment, they also use the internet very often to look for health information (23). Therefore, focusing on the internet, including mobile applications, can be the next innovative step in promoting health literacy that starts with the youngest members of our society.

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Appendices

Appendix 1: EQIP 36 scale

EQIP 36 Fragebogen

Datum: Reviewer Initialen:

Produced by		If known, wards and departments using	
Year of publication			
Size			
Category of information	Services	Discharge or after care	Condition or illness
	Test, operation, investigation or procedure	Medication or product	Miscellaneous
Score			

		yes	partly	no	does not apply
Content (18 items)					
Q1	Initial definition of which subjects will be covered				
Q2	Coverage of the above-defined subjects (if ''no'' above, does not apply)				
Q3	Description of the medical problem				
Q4	Definition of the purpose of the medical intervention				
Q5	Description of treatment alternatives (including no treatment)				
Q6	Description of the sequence of the medical procedure				
	Prior to intervention				
	During intervention				
	Post-intervention				
Q7	Description of qualitative benefits (e.g. improved mobility)				
Q8	Description of quantitative benefits (e.g. ''40% of patients regain hand mobility'')				
Q9	Description of qualitative risks and side-effects				
Q10	Description of quantitative risks and side-effects (e.g. ''two thirds of patients experience headache'')				
Q11	Addressing quality of life issues (may not apply if very short intervention)				
Q12	Description of how potential complications will be dealt with (e.g. ''if you feel nauseous we will change the medication'')				
Q13	Description of precautions that the patient may take (e.g. ''do not eat 6 h before anaesthesia'')				
Q14	Mention of alert signs that the patient may detect (e.g. ''if you feel a burning sensation call the nurse'')				
Q15	Addressing medical intervention cost and insurance issues				
Q16	Specific contact details for hospital services				
Q17	Specific details of other sources of reliable information/support				
Q18	The document covers all relevant issues on the topic (summary item for all content criteria)				
Score (content)					

Identification data (6 items)					
Q19	Date of issue or revision				
Q20	Logo of the issuing body				
Q21	Name of persons or entities that produced the document				
Q22	Name of persons or entities that financed the document				
Q23	Short bibliography of evidence-based data used in the document				
Q24	The document states if and how patients were involved/consulted in its production				
Score (identification)					
Structure (12 items)					
Q25	Use of everyday language, explains complex words or jargon				
Q26	Use of generic names for all medications or products				
Q27	Use of short sentences (<15 words on average)				
Q28	The document personally addresses the reader				
Q29	The tone is respectful				
Q30	Information is clear (no ambiguities or contradictions)				
Q31	Information is balanced between risks and benefits				
Q32	Information is presented in a logical order				
Q33	The design and layout are satisfactory (excluding figures or graphs see below)				
Q34	Figures or graphs are clear and relevant (if absent, 'does not apply')				
Q35	The document has a named space for the reader's notes				
Q36	The document includes a consent form, contrary to recommendations				
Score (structure)					
Score					

Appendix 2: Basic version of the document sent via letter or e-mail to health professionals, experts and institutions

Medizinische Universität Graz

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Date

Health information for children & teenagers

Dear ladies and gentlemen,

the **Institute of General Practice and Evidence-based Health Services Research, Medical University of Graz**, is conducting a **research on health information, which is directly aimed at children and teenagers**.

Findings of this search will be used by the Inclusive Education Unit (Faculty of Environmental, Regional and Educational Sciences) of the University of Graz for the project "**HeLi-D**" ("Health Literacy und Diversity für SchülerInnen der Sekundarstufe I"). This project aims to develop and implement a computer-assisted program to foster Health Literacy in Styrian students aged from 12 to 14 years, considering their diversity.

We kindly ask you for your support. We would be grateful for any **health information aimed directly at children and teenagers of any age group – not at their parents, teachers or other attachment figures - and on any topic**. The

health information may be available online or as a hard copy, as well as in English or German. We are also thankful for **further information** on this subject.

Please contact us if you know of any corresponding health information for children or teenagers. If required, we can send you a paid reply-envelope.

Thank you very much for your help!

With kind regards

Univ. Prof. Dr. med. Andrea Siebenhofer-Kroitzsch
Director

Eva Schenkeli
Project assistant
eva.schenkeli@medunigraz.at

Appendix 3: Details on the found items

Nr.	Title [English description]	Author/publisher [English]	Year	Explanation of the assignment to the different age target groups	Approach through which the item was found within the search
Health information for teenagers 12 years old and older in English					
1.1	A guide for teenagers with eczema Live your life	National Eczema Society	2017	Indicated in the title	Online search
1.2	Ask A Scientist How Do People Become Infected With Germs?	U.S. Department of Health and Human Services Centers for Disease Control and Prevention	2017	Complex language, long sentences & medical terms	Online search
1.3	Ask A Scientist How Does My Body Fight Disease	U.S. Department of Health and Human Services Centers for Disease Control and Prevention	2017	Complex language, long sentences & medical terms	Online search
1.4	Coping with thoughts of suicide Information for youth	CHEO - Children's Hospital of Eastern Ontario	2014	Indicated in the title	Online search
1.5	Depression Information for youth	CHEO - Children's Hospital of Eastern Ontario	2013	Indicated in the title	Online search
1.6	Eating Disorders Information for youth	CHEO - Children's Hospital of Eastern Ontario	2014	Indicated in the title	Online search
1.7	OCD: Obsessive Compulsive Disorder Information for youth	CHEO - Children's Hospital of Eastern Ontario	2015	Indicated in the title	Online search
1.8	Psychosis Information for youth	CHEO - Children's Hospital of Eastern Ontario	2015	Indicated in the title	Online search

1.9	Self-Harm Information for youth	CHEO - Children's Hospital of Eastern Ontario	2015	Indicated in the title	Online search
1.10	Social Anxiety Information for youth	CHEO - Children's Hospital of Eastern Ontario	2014	Indicated in the title	Online search
1.11	Mental Health and Mental Illness Information for youth	CHEO - Children's Hospital of Eastern Ontario	2014	Indicated in the title	Online search
1.12	Questions about mental health?	Rethink Mental Illness	2014	Indicated within the body text	Online search
1.13	My parent is in hospital Information for older children and teenagers	South London and Maudsley NHS Foundation Trust	2018	Indicated in the title	Online search
1.14	Life's simple 7 for Kids 7 Simple Ways to Live Better!	American Heart Association / Heart Fund	2013	Long sentences, medical terms, percent values	IAMEV
Health information for teenagers 12 years old and older in German					
1.15	Schlafstörungen [Sleeping disorders]	IQWIG - Institute for Quality and Efficiency in Health Care	2017	Indicated within the item	IAMEV
1.16 A	Luzie möchte einmal Mutter werden Eine Informationsbroschüre für jugendliche Patientinnen mit einer Krebserkrankung [Information on fertility for teenage girls suffering from cancer]	Berliner Krebsgesellschaft e. V. [Berlin Cancer Society]	2013	Indicated in the title	Online search
1.16 B	Short version of 1.16 A: Fruchtbarkeit nach Chemo- und Strahlentherapie bei Mädchen	Berliner Krebsgesellschaft e. V. [Berlin Cancer Society]	2016	-	-

1.17 A	Mischa möchte einmal Vater werden Eine Informationsbroschüre für jugendliche Partienten mit einer Krebserkrankung [Information on fertility for teenage boys suffering from cancer]	Berliner Krebsgesellschaft e. V. [Berlin Cancer Society]	2013	Indicated in the title	Online search
1.17 B	Short version of 1.17 A: Fruchtbarkeit nach Chemo- und Strahlentherapie bei Jungen	Berliner Krebsgesellschaft e. V. [Berlin Cancer Society]	2016	-	-
1.18	Mama geht's heut' nicht so gut Wenn Eltern psychisch krank sind [Information for teenagers with mentally ill parents]	Kinder- und Jugendanwaltschaft (kija) Salzburg [Children's and youth advocacy of Salzburg]	2016	Indicated within the body text	Found within the search for institutions who were contacted
1.19	pocket-info: Alkohol Informationsbroschüre für junge Menschen [Alcohol]	Institut für Suchtprävention (SP) der Sucht- und Drogenkoordination Wien gemeinnützige GmbH (SDW) & wienXtra-jugendinfo [Institute for Addiction Prevention of the Addiction and Drug Coordination Vienna & the organisation wienXtra]	2013	Indicated in the title	Database of a contacted institution (GIVE – Service Centre for Health Promotion in Austrian Schools)
1.20	pocket-info: Cannabis Informationsbroschüre für junge Menschen [Cannabis]	Institut für Suchtprävention (SP) der Sucht- und Drogenkoordination Wien gemeinnützige GmbH (SDW) & wienXtra-jugendinfo [Institute for Addiction Prevention of the Addiction and Drug Coordination Vienna & the organisation wienXtra]	2016	Indicated in the title	Database of a contacted institution (GIVE – Service Centre for Health Promotion in Austrian Schools)

1.21	pocket-info: Tabak Informationsbroschüre für junge Menschen [Tobacoo]	Institut für Suchtprävention (SP) der Sucht- und Drogenkoordination Wien gemeinnützige GmbH (SDW) & wienXtra-jugendinfo [Institute for Addiction Prevention of the Addiction and Drug Coordination Vienna & the organisation wienXtra]	2014	Indicated in the title	Database of a contacted institution (GIVE – Service Centre for Health Promotion in Austrian Schools)
1.22	Selbstverletzendes Verhalten Die schnelle Info für junge Leute [Self-harming behaviours]	Verein wienXtra, in Kooperation mit der MA 13-Fachbereich Jugend [Organisation wienXtra, in cooperation with the magistrale department 13 (youth), Vienna]	2017	Indicated in the title	Database of a contacted institution (GIVE – Service Centre for Health Promotion in Austrian Schools)
1.23	Wege aus der Essstörung Zurück zum Genuss [Eating disorders]	Amt der Oö. Landesregierung, Direktion Bildung und Gesellschaft, Gruppe Jugend, JugendService [Office of the Government of Upper Austria, Department of Education and Society]	2016	Indicated within the item	Database of a contacted institution (GIVE – Service Centre for Health Promotion in Austrian Schools)
1.24	Infos zum Impfen Kleiner Piks mit großer Wirkung [Influenza vaccination]	Bundeszentrale für gesundheitliche Aufklärung (BZgA) [German Federal Centre for Health Education]	2015	Indicated within the body text	Database of the German Federal Centre for Health Education (BZgA) as recommended by a contacted expert

1.25	Rauchfrei durchs Leben Rauchfrei leicht(er) gemacht [Non-Smoking]	Bundeszentrale für gesundheitliche Aufklärung (BZgA) [German Federal Centre for Health Education]	2017	Written about adults in third person within the body text & teenagers shown on the pictures	Database of the German Federal Centre for Health Education (BZgA) as recommended by a contacted expert
1.26	Schluss mit Rauchen Rauchfrei leicht(er) gemacht [Smoking cessation]	Bundeszentrale für gesundheitliche Aufklärung (BZgA) [German Federal Centre for Health Education]	2016	Indicated within the body text	Database of the German Federal Centre for Health Education (BZgA) as recommended by a contacted expert
1.27	Vorsicht Wasserpfeife [Water pipe]	Bundeszentrale für gesundheitliche Aufklärung (BZgA) [German Federal Centre for Health Education]	2017	Teenagers shown on the pictures	Database of the German Federal Centre for Health Education (BZgA) as recommended by a contacted expert
1.28	Sicher durch die Nacht Infos zum Umgang mit Alkohol und Tipps für Notfälle [Alcohol, including attitude to alcohol and emergencies]	Bundeszentrale für gesundheitliche Aufklärung (BZgA) [German Federal Centre for Health Education]	2017	According to the homepage a campaign for teenagers and young adults	Database of the German Federal Centre for Health Education (BZgA) as recommended by a contacted expert

Health information for children under the age of 12 in English					
2.1	All about stroke: information for children	Stroke Association	2017	Simple language & short sentences	Online search
2.2	My parent is in hospital Information for children aged 7-11 with a parent in a mental health hospital	South London and Maudsley NHS Foundation Trust	2018	Indicated in the title	Online search
2.3 A	Sally Bear's Daddy Is In Hospital A story for children aged 3-6 to be read with an adult	South London and Maudsley NHS Foundation Trust	2018	Indicated in the title	Online search
2.3 B	<u>Second version:</u> Sammy Bear's Mummy Is In Hospital A story for children aged 3-6 to be read with an adult	South London and Maudsley NHS Foundation Trust	2018	-	-
Health Information for children under the age of 12 in German					
2.4	Clown Zitzewitz und der Sonnenschutz [Story about sun protection]	Deutsche Krebsilfe e.v. & Arbeitsgemeinschaft Dermatologische Prävention e.V. [German Cancer Aid & working group Dermatological Prevention]	2014	Story for young children	Online search

2.5	Die Sonne und Wir - Sonnencreme Richtig eincremen mit Anna und Max [Sunscreen]	Zentrum für Molekulare Medizin Köln (ZMMK), Universität zu Köln & Klinik für Dermatologie und Venerologie, Uniklinik Köln Projekt "Die Sonne und Wir - Sonnenbus" [Center for Molecular Medicine Cologne (CMMC), University of Cologne & Clinic for Dermatology and Venerology, University Clinic Cologne]	2017	Based on number 2.6	Online search
2.6	Unterwegs mit Anna und Max Wir gehen ins Freibad [UV protection]	Zentrum für Molekulare Medizin Köln (ZMMK), Universität zu Köln & Klinik für Dermatologie und Venerologie, Uniklinik Köln Projekt "Die Sonne und Wir - Sonnenbus" [Center for Molecular Medicine Cologne (CMMC), University of Cologne & Clinic for Dermatology and Venerology, University Clinic Cologne]	2017	Indicated within the item	Online search
2.7	Gesunde Zähne [Dental health]	Styria vitalis	2015	Language and layout appropriate for young children & children on the pictures are under the age of 12	Found within the search for institutions who were contacted

2.8	Mia, Mats und Moritz… …und ihre Mama, wenn sie wieder trinkt [Story for children with an alcoholic mother]	DHS - Deutsche Hauptstelle für Suchtfragen e.V. [German Centre for the Control of Drug Abuse]	2017	Story for young children	Database of the German Federal Centre for Health Education (BZgA) as recommended by a contacted expert
Health information with overlapping age target groups (special cases)					
3.1	English: Cystic FibrosIs here for schools	Cystic Fibrosis Trust	2016	Age target group: 10 years and above Simple language, child-appropriate layout & according to footnote also for teachers	Online search
3.2	German: Regelschmerzen - Infos für Mädchen [Information for girls on dysmenorrhea]	IQWIG - Institute for Quality and Efficiency in Health Care	2016	Age target group: 10-14 years Girls shortly before or in puberty	Search within institutions (IQWIG)

Appendix 4: Detailed results of the evaluation of the found items

Nr.	Title [English description]	Final Score[5]	Mean: Content[6]	Mean: Identification[6]	Mean: Structure[6]
Health information for teenagers 12 years old and older in English					
1.1	A guide for teenagers with eczema Live your life	0.74	0.66	0.67	0.89
1.2	Ask A Scientist How Do People Become Infected With Germs?	0.57	0.48	0.50	0.72
1.3	Ask A Scientist How Does My Body Fight Disease	0.57	0.40	0.50	0.81
1.4	Coping with thoughts of suicide Information for youth	0.72	0.59	0.71	0.86
1.5	Depression Information for youth	0.77	0.67	0.88	0.78
1.6	Eating Disorders Information for youth	0.70	0.64	0.71	0.75
1.7	OCD: Obsessive Compulsive Disorder Information for youth	0.72	0.59	0.79	0.76
1.8	Psychosis Information for youth	0.67	0.59	0.71	0.72
1.9	Self-Harm Information for youth	0.64	0.50	0.71	0.73
1.10	Social Anxiety Information for youth	0.67	0.55	0.71	0.75
1.11	Mental Health and Mental Illness Information for youth	0.66	0.52	0.71	0.76
1.12	Questions about mental health?	0.69	0.52	0.83	0.71

Nr.	Title [English description]	Final Score[5]	Mean: Content[6]	Mean: Identification[6]	Mean: Structure[6]
1.13	My parent is in hospital Information for older children and teenagers	0.70	0.47	0.83	0.81
1.14	Life's simple 7 for Kids 7 Simple Ways to Live Better!	0.74	0.70	0.67	0.86
Health information for teenagers 12 years old and older in German					
1.15	Schlafstörungen [Sleeping disorders]	0.69	0.47	0.83	0.78
1.16 A	Luzie möchte einmal Mutter werden Eine Informationsbroschüre für jugendliche Patientinnen mit einer Krebserkrankung [Information on fertility for teenage girls suffering from cancer]	0.76	0.66	0.83	0.80
1.16 B	Short version of 1.16 A: Fruchtbarkeit nach Chemo- und Strahlentherapie bei Mädchen	-	-	-	-
1.17 A	Mischa möchte einmal Vater werden Eine Informationsbroschüre für jugendliche Partienten mit einer Krebserkrankung [Information on fertility for teenage boys suffering from cancer]	0.74	0.59	0.83	0.80
1.17 B	Short version of 1.17 A: Fruchtbarkeit nach Chemo- und Strahlentherapie bei Jungen	-	-	-	-
1.18	Mama geht's heut' nicht so gut Wenn Eltern psychisch krank sind [Information for teenagers with mentally ill parents]	0.70	0.67	0.67	0.75
1.19	pocket-info: Alkohol Informationsbroschüre für junge Menschen [Alcohol]	0.76	0.80	0.67	0.81

Nr.	Title [English description]	Final Score[5]	Mean: Content[6]	Mean: Identification[6]	Mean: Structure[6]
1.20	pocket-info: Cannabis Informationsbroschüre für junge Menschen [Cannabis]	0.71	0.70	0.67	0.75
1.21	pocket-info: Tabak Informationsbroschüre für junge Menschen [Tobacoo]	0.69	0.66	0.67	0.75
1.22	Selbstverletzendes Verhalten Die schnelle Info für junge Leute [Self-harming behaviours]	0.66	0.53	0.67	0.78
1.23	Wege aus der Essstörung Zurück zum Genuss [Eating disorders]	0.65	0.50	0.67	0.78
1.24	Infos zum Impfen Kleiner Piks mit großer Wirkung [Influenza vaccination]	0.51	0.38	0.67	0.50
1.25	Rauchfrei durchs Leben Rauchfrei leicht(er) gemacht [Non-Smoking]	0.63	0.58	0.50	0.81
1.26	Schluss mit Rauchen Rauchfrei leicht(er) gemacht [Smoking cessation]	0.63	0.53	0.50	0.86
1.27	Vorsicht Wasserpfeife [Water pipe]	0.54	0.33	0.50	0.78
1.28	Sicher durch die Nacht Infos zum Umgang mit Alkohol und Tipps für Notfälle [Alcohol, including attitude to alcohol and emergencies]	0.65	0.60	0.50	0.84

Nr.	Title [English description]	Final Score[5]	Mean: Content[6]	Mean: Identification[6]	Mean: Structure[6]
Health information for children under the age of 12 in English					
2.1	All about stroke: information for children	0.78	0.69	0.83	0.80
2.2	My parent is in hospital Information for children aged 7-11 with a parent in a mental health hospital	0.75	0.52	0.83	0.89
2.3 A	Sally Bear's Daddy Is In Hospital A story for children aged 3-6 to be read with an adult	0.69	0.38	0.79	0.91
2.3 B	Zweite Version: Sammy Bear's Mummy Is In Hospital A story for children aged 3-6 to be read with an adult	-	-	-	-
Health information for children under the age of 12 in German					
2.4	Clown Zitzewitz und der Sonnenschutz [Story about sun protection]	0.62	0.44	0.50	0.92
2.5	Die Sonne und Wir - Sonnencreme Richtig eincremen mit Anna und Max [Sunscreen]	0.68	0.67	0.50	0.86
2.6	Unterwegs mit Anna und Max - Wir gehen ins Freibad [UV protection]	0.82	0.64	0.83	1.00
2.7	Gesunde Zähne [Dental health]	0.62	0.39	0.67	0.81
2.8	Mia, Mats und Moritz… …und ihre Mama, wenn sie wieder trinkt [Story for children with an alcoholic mother]	0.71	0.47	0.67	1.00

Nr.	Title [English description]	Final Score[5]	Mean: Content[6]	Mean: Identification[6]	Mean: Structure[6]
Health information with overlapping age target groups (special cases)					
3.1	English: Cystic FibrosIs here for schools	0.64	0.62	0.54	0.78
3.2	German: Regelschmerzen - Infos für Mädchen [Information for girls on dysmenorrhea]	0.76	0.61	0.83	0.85

[5] The final score is the mean of both evaluators' total scores. For details on the calculation see subsection 2.3.1. The interpretation of the final scores of the evaluation of the found health information for children is difficult and therefore only partially representative, as especially the applicability of the category "content" of EQIP 36 is limited. For details see section 4.1.

[6] The mean score of the corresponding chapter is the mean of both evaluators results of the chapter. The category "content" is difficult to apply to the health information for children, for details see section 4.1.