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Published in:
Children and Youth Services Review

DOI:
[10.1016/j.chilyouth.2021.106288](https://doi.org/10.1016/j.chilyouth.2021.106288)

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Document Version
Publisher's PDF, also known as Version of record

Publication date:
2021

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Eijgermans, D. G. M., Fang, Y., Jansen, D. E. M. C., Bramer, W. M., Raat, H., & Jansen, W. (2021). Individual and contextual determinants of children's and adolescents' mental health care use: A systematic review. *Children and Youth Services Review*, 131, [106288].
<https://doi.org/10.1016/j.chilyouth.2021.106288>

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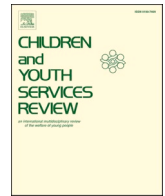
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Individual and contextual determinants of children's and adolescents' mental health care use: A systematic review

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ARTICLE INFO

Keywords:

Mental health services
Patient acceptance of health care
Social determinants of health
Disease susceptibility
Health services needs and demand

ABSTRACT

To improve the access to children's mental health care, knowledge on the determinants of care use is important. Where previous systematic reviews mainly focus on parent-related factors, we are the first to systematically review individual and contextual determinants of mental health care use in children under the age of 18 years old. Five electronic databases were searched for studies on determinants of children's and adolescents' mental health care use. Twenty-two longitudinal, population-based, quantitative studies were included based on eight inclusion criteria. The Behavioural Model of Health Service Use by Andersen was used for data synthesis. The quality of all studies was rated as high. Seven determinants were labelled with 'good evidence' of an association in this systematic review, namely screening programs for mental health problems, family composition, previous mental health care use, overall problem level, externalising behaviour, delinquent behaviour and impact/impairment. No association was found with age, urbanisation, and somatic complaints. Evidence was inconsistent for gender, socioeconomic position, ethnic background, internalising behaviour, aggressive behaviour and depression/anxiety. Little evidence was found for 27 determinants. This systematic review found 'good evidence' for seven determinants of children's mental health care use which could be used to improve the access to care. Quality of studies, direction for future research and implications for policy and practice are discussed. More insight is needed in contextual factors and factors for which limited or inconsistent evidence was found. These insights will contribute to decreasing the discrepancies in mental health care use and facilitating earlier intervention.

1. Introduction

About 10–20% of the children and adolescents in Western countries suffer from mental health problems (Belfer, 2008; Kieling et al., 2011; Ravens-Sieberer et al., 2008). These problems influence the quality of life of children and their parents (Damen et al., 2011; Dey et al., 2018; Wehmeier et al., 2010). Moreover, mental health problems in childhood are related, among other factors, to impaired development and continuance of mental health problems into adulthood (Kessler et al., 2007). In addition to the individual burden, mental health problems can also lead to social costs (Kessler et al., 2008). Children with

mental health problems are more likely to go to special education and to follow criminal careers (Knapp, 2003; Scott et al., 2001). Mental health problems are, according to the World Health Organization (2020), defined as experiencing problems in behaviour, emotions, thoughts or relationships. They can vary widely; from problems in psychosocial functioning, to impaired cognitive development, to problems in the context of the child (Daamen & Schouten, 2018).

Despite these serious consequences of mental health problems, only half of the children with these problems actually receive care (Georgiades et al., 2019; Simon et al., 2015). To improve access to mental health care, it is essential to identify the characteristics of children more

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<https://doi.org/10.1016/j.childyouth.2021.106288>

Received 6 January 2021; Received in revised form 15 October 2021; Accepted 7 November 2021

Available online 9 November 2021

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likely to receive care compared to others. This knowledge could help to create better prevention and treatment strategies, facilitating early intervention by targeting specific subgroups. Intervening early can prevent enduring and worsening of mental health problems and is more cost-effective than treatment at a later stage in life (McGorry et al., 2011; Peters-Scheffer et al., 2012; Rosen et al., 2015). Furthermore, several systematic reviews have shown that more than half of the evidence-based prevention programs aimed at mental health at school and primary care lead to better health outcomes (Cilar et al., 2020; Rojas et al., 2019; Werner-Seidler et al., 2017).

Multiple determinants do influence the mental health care use of children; individual as well as contextual characteristics (Andersen et al., 2013). Some of these determinants have been summarised in earlier systematic reviews. For example, Reardon et al. (2017) reviewed parents' perceived barriers to and facilitators of their children's mental health care use; Ryan et al. (2015) concentrated on parent and family factors associated with service use; Gulliver et al. (2010) focused on the perceived barriers to and facilitators of help-seeking in young people aged 12 to 25 years; and MacDonald et al. (2018) studied determinants of the pathways to care. Although these studies focused on determinants of mental health care use in children, insight into the role of contextual and individual child determinants is still lacking.

This systematic review aims to describe quantitative studies on the individual and contextual determinants of mental health care use in children and adolescents under the age of 18 years old. In this systematic review, mental health care is defined as inpatient and outpatient services for the treatment of mental, social and emotional problems, e.g. psychotherapy, family therapy, cognitive therapy and parent counselling (World Health Organization, 2020). Determinants include predisposing, enabling and need factors on both the individual and contextual level, see Fig. 1 (Andersen et al., 2013). Insight into which children receive care, and which contextual factors play a role in this, will enable care providers to improve access to and provision of care. Furthermore, this knowledge will contribute to the development of preventive strategies and point at future directions for research on mental health care use by children.

2. Methods

2.1. Search strategy

This systematic review was registered at PROSPERO (ID: CRD42019122581) on March 5, 2019, and the PRISMA Statement was used as a guideline, see Supplement 1 (Moher et al., 2009). An experienced information specialist (WB) created and performed the search on July 30th, 2020, combining four topics representing: mental health care, children, health care use, and study types (controlled, cohort and international studies). The full search can be found in Supplement 2. The

search was deliberately kept broad to increase the likelihood of including all studies on this topic (Lipsey & Wilson, 2001). If possible within the specific database's search functionality, the search strategy was restricted to the English language and excluded conference abstracts. No limitation was set on the date of publication or type of mental health problem. The searches were executed in Embase via Embase.com (date of inception 1971), MEDLINE ALL via Ovid (1946), Web of Science Core Collection (1975), the Cochrane Library CENTRAL register of Trials via Wiley (1992), and PsycINFO via Ovid (1806), and was tailored to each database. Additionally, reference lists of the included articles and of relevant systematic reviews identified through the search were searched manually for eligible studies.

2.2. Study selection

The title-abstract screening was performed by two researchers independently (DE and YF). Discrepancies between the researchers were discussed until consensus was reached. For the studies to be included, they had to meet the following inclusion criteria:

1. *Care use:* Mental health care use is the outcome of the study.
2. *Mental health care:* The type of care is not enforced, so the participants receive care voluntarily. Thereby, a clear description of the type of care has to be mentioned and must be some form of mental, social or emotional psychological care. This includes psychotropic medication.
3. *Determinant:* The determinants studied are directly related to the child or the child's context. Factors related to the parents or family of the child are excluded.
4. *Target population:* Children are the main target group of the study. Study populations with a mean age over 18 and/or participants over 21 years old are excluded. A study is included when the study includes older participants, but performs separate analyses on a subgroup meeting the age criteria. The children live in Western countries as defined by Statistics Netherlands (2004) and have standard access to mental health care (e.g. not in juvenile detention).
5. *Control group:* a control or reference group using no care is part of the study.
6. *Type of study:* The study uses quantitative research methods, but is not a systematic review or a meta-analysis.
7. *Population-based studies:* the study sample is based on a general population. Studies on specific study populations, e.g. only including children with autism, were excluded.
8. *Longitudinal design:* the determinants are measured at an earlier point in time than the outcome of mental health care use.

After the title-abstract screening, the full texts of the remaining studies were screened by two researchers independently (DE and YF).

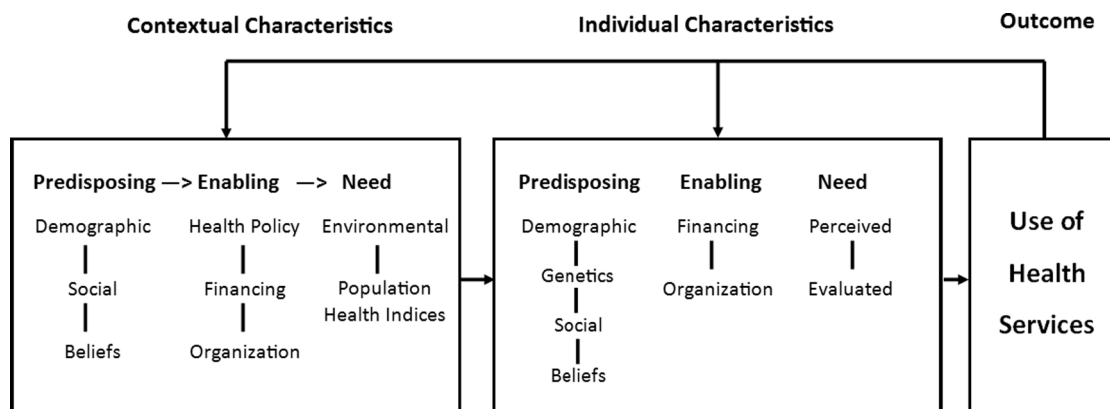


Fig. 1. Adapted version of the Behavioural Model of Health Service Use (Andersen et al., 2013).

The same inclusion criteria were applied. Discrepancies between the researchers were discussed until consensus was reached. If necessary, a third reviewer (WJ) was consulted. In case multiple studies - that met the inclusion criteria - were based on the same study sample, those studies were included in this systematic review, but counted as one in the 'level of evidence'.

2.3. Data extraction and quality assessment

From all included studies, the following data were extracted as characteristics of the studies: title, first author, year of publication, country, number of participants, database, study period, type of population, study design, age at care use, follow-up period, percentage of children using mental health care, type of mental health care, and data source of the determinant and outcome. This process was completed by two researchers independently (DE and YF). Discrepancies between the researchers were discussed until consensus was reached.

For quality assessment of the studies, the QualSyst tool of Kmet et al. (2004) was used. In this checklist, 14 items are listed, which were scored with 2 points (yes), 1 point (partial), or 0 points (no) each. All scores were added together and divided by the total possible sum to calculate the quality score per study. Based on this final score, the quality of the study was rated as high (≥ 0.75), medium (≥ 0.55 and < 0.75), or low (< 0.55) (Davis et al., 2012; Kmet et al., 2004; Landais et al., 2020). This process was performed by two researchers independently (DE and YF). Discrepancies between the researchers were discussed until consensus was reached.

The following data were extracted regarding the studied determinants: the determinant studied in association with mental health care use, whether this association was significant and if so, the direction of the association.

2.4. Data synthesis

Data were categorised according to The Behavioural Model of Health Service Use by Andersen et al. (2013), see Fig. 1. According to this model, the use of health services is determined by predisposing, enabling and need determinants on the contextual and individual level. In other words, whether someone uses care is determined by the individual's predisposition to use care, factors that facilitate or inhibit care use, and the need for care (Andersen, 1995). Examples on the contextual level are demographics of the community (predisposing), authoritative decisions on health care (enabling), and community health indices (need). Examples on the individual level are individuals' demographics (predisposing), resources to pay for care (enabling), and presence of mental health problems (need). To guide the process of data synthesis and interpretation of the results, the guidelines created by Roberts et al. (2018) were used as level of evidence for the studied determinants (see Table 1). Small adjustments were made to these guidelines to fit the aim of the current systematic review. Each studied determinant was

Table 1
Level of evidence criteria, adjusted criteria based on Roberts et al. (2018).

Good evidence of an association: $\geq 75\%$ of studies that investigated this factor report an association in the same direction (positive or negative), of which ≥ 2 (using different datasets) are of high quality
No association: $< 25\%$ of studies that investigated this factor reported an association, of which ≥ 2 (using different datasets) are of high quality
Inconsistent evidence: 25–75% of studies that investigated this factor report an association, of which ≥ 2 (using different datasets) are of high quality or $\geq 25\%$ of studies that investigated this factor reported a positive association and $\geq 25\%$ of studies that investigated this factor reported a negative association, of which ≥ 2 (using different datasets) are of high quality
Little evidence: 1 investigated this association, or 2 studies that reported a different direction of the association, or $< 75\%$ high-quality studies
Not examined: No studies investigated the association between this factor and care use

classified as 'good evidence of an association', 'no association', 'inconsistent evidence', 'little evidence' or 'not examined', see Table 1 for more details. Occasionally, a study found a significant and a not significant association for the same determinant, for example, when separate analyses were performed in different age groups. In that case, the significant association was decisive for rating the level of evidence. This approach was also applied when different studies were performed on the same study sample.

3. Results

The flow diagram of the included studies is presented in Fig. 2. The search resulted in 5,942 studies after deduplication, which were screened on title and abstract. The full-text screening of the remaining 657 studies resulted in 22 studies that were eligible for inclusion in this systematic review. Those 22 studies were performed on 18 unique study samples.

Characteristics of the included studies are described in Table 2. Most studies were conducted in the United States of America ($n = 11$). The other included studies originate from the Netherlands ($n = 4$), Finland ($n = 2$), Norway ($n = 2$), Denmark ($n = 1$), Spain ($n = 1$), and the United Kingdom ($n = 1$). The number of participants per study ranges from 151 to 9,381,892 participants. Most studies ($n = 14$) reported mental health care use percentages between 5% and 15%. These percentages refer to a period varying from one month to two years in twelve studies and a longer or unknown period in the other ten studies. The follow-up time in almost half of the studies ($n = 10$) was four years or less, five to ten years in half of the studies ($n = 11$) and over ten years in one study. About one-third of the studies were published in or after 2015 ($n = 7$). In thirteen studies, the study participants were 12 to 18 years old when mental health care use was measured, in two studies under 12 years, and in the remaining studies ($n = 7$) both age groups were represented. The quality of all included studies was rated as high since they all scored more than 0.75 points on the quality assessment (for more details on the results of the quality assessment, see supplement 3).

The predisposing, enabling and need determinants that were identified by the included studies are presented in Table 3, classified according to the Behavioural Model of Health Service use (Andersen et al., 2013). The level of evidence per determinant is provided.

3.1. Contextual determinants

Three contextual enabling determinants were studied. Screening for mental health problems was the only determinant studied in two studies and showed 'good evidence' of an association with children's mental health care use (2/2 studies: 2 out of 2 studies found a significant association). The two other determinants studied were a policy on covering mental health and substance abuse-related care costs (0/1 study), and the implementation of mental health problem screening as well as colocation policies (1/1 study) as determinants of mental health care use, both providing little evidence. None of the included studies addressed contextual predisposing or need determinants.

3.2. Individual predisposing

Thirteen individual predisposing determinants were studied. 'Good evidence' of an association with mental health care use was found for family composition other than two biological parents (4/6 studies, 5 study samples) and previous mental health care use (2/3 studies, 2 study samples). 'No association' was found for age (1/5 studies, 4 study samples) and urbanisation (0/2 studies).

Inconsistent evidence was found regarding gender. Of the eight studies (7 study populations) on this determinant, one study found that girls use more care than boys, and two studies found that boys use more care than girls. Five studies did not find an association. Three of these eight studies found an interaction between gender and time. In all three

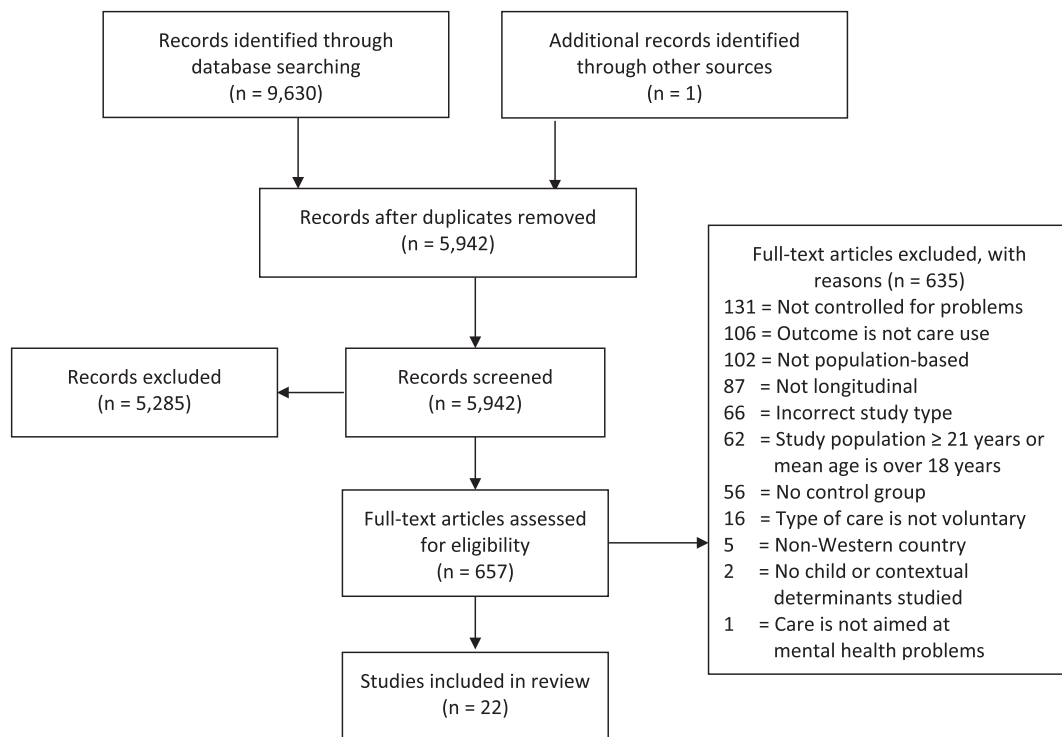


Fig. 2. PRISMA flowchart.

studies, it was suggested that boys use relatively more care earlier in childhood and girls use relatively more care during adolescence. Furthermore, inconsistent evidence was found regarding having a high socioeconomic position (8 studies, 5 study populations). Two studies found a positive association, one found a negative association and seven did not find an association. Evidence was also inconsistent regarding having a majority ethnic background (2/4 studies).

Little evidence was available on the determinants poor school performance (1 out of 2 studies found a significant association), high self-competence (0/1 study), involvement in activities (1/1 study), family functioning (1/2 studies), any substantial barriers to obtaining care (not further specified in study, 0/1 study), and a combination of deviant peers, school performance and school achievement (1/1 study).

3.3. Individual enabling

Two individual enabling determinants were studied. Only little evidence was available; on being insured (1/1 study) and on social support by relatives and friends (1 out of 2 studies found a significant association). The one study that found an association with social support showed that children who experience more social support use less mental health care.

3.4. Individual need

In total, 23 individual need factors were studied. ‘Good evidence’ of an association with children’s mental health care use was found for overall problem level (5 out of 6 studies found a significant association), externalising behaviour (7/9 studies, 7 study populations), delinquent behaviour (2/2 studies), and impairment/impact (3/4 studies, 3 study populations). ‘No association’ was found for somatic complaints (0/2 studies). Evidence was inconsistent for internalising behaviour. Three out of eight studies (6 study populations) found a positive association, one found a negative association. Inconsistent evidence was also found regarding depression/anxiety (4/7 studies, 6 study populations) and aggressive behaviour (1/3 studies).

Only little evidence was available on the determinants ADHD (0/1 study), attention problems (0/1 study), destructive behaviour (0/1 study), psychotic experiences (0/1 study), sleep problems (0/1 study), social competence (0/1 study), social problems (0/1 study), thought problems (0/1 study), withdrawn (1/2 studies), learning problems (1/1 study), antisocial problems (1/1 study), hyperkinetic problems (0/1 study), neurotic problems (0/1 study), irritability (1/1 study), being bullied (1/1 study), victimisation (1/2 studies), and chronic disease (0/1 study).

4. Discussion

This systematic review provides an overview of the individual and contextual determinants of mental health care use, based on population-based, longitudinal studies. ‘Good evidence’ of an association with mental health care use was found for seven determinants, namely screening for mental health problems, family composition other than two biological parents, previous mental health care use, overall problem level, externalising problems, delinquent behaviour and impairment/impact. ‘No association’ was found for three determinants, namely age, urbanisation, and somatic complaints. Evidence was inconsistent for six determinants, namely gender, socioeconomic position, ethnic background, internalising problems, aggressive behaviour and depression/anxiety. Only little evidence was available on 27 determinants. Following Andersen’s model on health service use, determinants on the individual enabling level were relatively less studied as compared to predisposing and need determinants. Population-based, longitudinal studies on determinants on the contextual predisposing and need level are lacking.

4.1. Contextual determinants

Screening for mental health problems was identified as determinant on the contextual level in this systematic review (Hacker et al., 2015, 2017; Husky et al., 2011). Mental health screening is associated with subsequently higher mental health care use. In the studies included in

Table 2
Characteristics of the included studies (N = 22).

First author (year of publication)	Country	Number of included participants	Database or sample	Study period	Type of study population	Study design	Age at care use (years)	Follow-up ¹ (years)	Mental health care use ² (%)	Type of mental health care	Data source: determinants/ outcome	Quality score (0–1)	Level of quality
Ameon-P'Olak (2010)	The Netherlands	2,149	TRAILS	2001–2004	Random sample of general population	Observational	13	2.5	6.8% in 2 years	Inpatient and outpatient psychiatric and psychological services	Parent, teacher, child/parent	1.00	High
Azrin (2007)	United States of America	177,938 + controls	FEHB plan and Medstat MarketScan	1999–2002	Children of parents enrolled in the Federal Employees Health Benefits Program	Quasi-experimental	3–18	4	5.5–13.0% in 2 years	Inpatient and outpatient mental health and substance abuse care	National data/ medical records	0.82	High
Brattfjell (2020)	Norway	995	Trondheim Early Secure Study	2007–2016	Community sample with oversampling of children with emotional and behavioural problems	Observational	7–12	8	4.4–13.4% in 2 years	Child and adolescent mental health specialised services and community services	Parent/ parent	0.91	High
Dougherty (2015)	United States of America	446	The Stony Brook Temperament Study	2005–2013	Random sample of general population	Observational	9	6	19.2% in 9 years	Psychotherapy and prescribed psychotropic medication	Parent/parent, child	1.00	High
Erath (2009)	United states of America	399	Child Development Project	1987–1998	Kindergarten pre-registration	Observational	16	12	31.1% in 16 years	Inpatient and outpatient mental health services and school-based services	Parent, teacher/ parent	0.95	High
Evans-Lacko (2017)	United Kingdom	14,647	National Child Development Study	1965–1974	Birth cohort	Observational	16	9	3.7–11.0% in 16 years	Any service to address emotional or behavioural problems	Parent, teacher, child/parent, child	1.00	High
Ezpeleta (2009)	Spain	151	–	2002–2005	Slum of Barcelona	Observational	9&13	3	25.3–38.9% time not specified	Inpatient and outpatient mental health services and school-based services	Parent, teacher, child/parent, child	0.91	High
Farmer (1999)	United States of America	1,007	Great Smoky Mountains Study	1992–1993	School based sample with oversampling of children with behaviour problems in a rural area	Observational	9,11&13	1	21.1% in 1 year	Any service to address emotional or behavioural problems	Parent, child/ parent, child	0.82	High
Goodman (2001)	United States of America	5,735	Add Health	1994–1995	School based sample of girls	Observational	16	1	10.6–13.6% in 1 year	Mental health counselling	Parent, child/ child	0.95	High

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Table 2 (continued)

First author (year of publication)	Country	Number of included participants	Database or sample	Study period	Type of study population	Study design	Age at care use (years)	Follow-up [†] (years)	Mental health care use [‡] (%)	Type of mental health care	Data source: determinants/ outcome	Quality score (0–1)	Level of quality
Guterman (2002)	United States of America	4,590	Add Health	1994–1996	School based sample	Observational	16	1	11.0% in 1 year	Mental health counselling	Child/child	0.95	High
Hacker (2017)	United States of America	9,381,892	MAX claims data	2006–2009	Medicaid eligible children	control series	4–17	3.5	3.5% in 1 month	Inpatient and outpatient mental health care and psychotropic medication	National data/ medical records	0.91	High
Hacker (2015)	United States of America	11,223	Cambridge Health Alliance data warehouse	2003–2008	Children visiting pediatric sites	Quasi-experimental	4–18	sufficient time to capture care use	2.4% in 1 month	Inpatient and outpatient psychiatric and psychological services	National data/ medical records	0.95	High
Husky (2011)	United States of America	656	–	2004–2005	School-based sample in an urban area	Randomized trial	15	0.5	At least 6,9% in 1 school semester	School-based and community-based services	Child/medical records	0.92	High
Ialongo (2001)	United States of America	1,030	–	Not mentioned	School-based sample in an urban area	Randomized trial	12	5	8.5–10.7% in 12 years	Services to address depression	Parent, child/parent	1.00	High
Laitinen-Krispijn (1999)	The Netherlands	2,496	–	1989–1994	School-based sample in an urban area	Observational	16	5	8.4% incidence in 5 years	Inpatient and outpatient psychiatric and psychological services	Parent/medical records	0.95	High
Pihlakoski (2004)	Finland	900	FFC	1988–1997	Firstborns	Observational	12	9	7.2% in 12 years	Any service to address emotional or behavioural problems	Parent/parent	0.86	High
Raven (2018)	The Netherlands	1,478	TRAILS	2001–2007	Random sample of general population	Observational	16	5	19.8% in 12 years	Specialist care to address emotional or behavioural problems	Parent, teacher, child/medical records	0.91	High
Reijneveld (2014)	The Netherlands	2,230	TRAILS	2001–2007	Random sample of general population	Observational	16	5	4.2–5.6% in 6 months	Any service to address emotional or behavioural problems	Parent, child, national data/parent	1.00	High
Rimvall (2020)	Denmark	1,572	Copenhagen Child Cohort 2000	2011–2017	Sample of the general population without children with psychiatric disorders at baseline	Observational	17	5	5.7% in 5 years	Psychiatric disorders	Parent, child, teacher, national data/ medical records	1.00	High
Sourander (2001)	Finland	857	Epidemiological Child Psychiatry Study	1989–1997	Random sample of general population	Observational	16	8	7.4% in 8 years	Mental health services	Parent, teacher, child/parent, child	0.95	High

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Table 2 (continued)

First author (year of publication)	Country	Number of included participants	Database or sample	Study period	Type of study population	Study design	Age at care use (years)	Follow-up (years)	Mental health care use [†] (%)	Type of mental health care	Data source: determinants/outcome	Quality score (0–1)	Level of quality
Turner (2007)	United States of America	1,009	DVS	2002–2004	Random sample of general population	Observational	6–17	2	14.3–19.7% in 1 year	Mental health counselling	Parent, child/parent	0.77	High
Wichstrøm (2014)	Norway	2,475	Trondheim Early Secure Study	2007–2011	Birth cohort	Observational	6	2	4.2–8.7% in 3 months	Any service to address emotional or behavioural problems	Parent/parent	0.95	High

[†] Follow-up period is the period from the measurement of the first included determinant to the outcome. [‡] Range of the percentage of mental health care use consists of the lowest and highest number of care use as described in the study, this can be due to multiple measurement points or different types of care.

our review, screening was performed at well-child visits in children and at schools in adolescents, both via questionnaires that were evaluated by health care professionals. Screening with validated tools might enable professionals to recognise and refer children with mental health problems that otherwise go unnoticed (Kataoka et al., 2002; Levitt et al., 2007). Also screening in combination with colocation strategies (locating social workers in behavioural health clinics) seems promising, however, only little evidence was available (Hacker, Penfold, Arsenault, Zhang, Soumerai, & Wissow, 2015). Besides this enabling factor, no other contextual determinants of mental health care use in children were found.

4.2. Individual determinants

On the level of individual predisposing determinants, we found family composition of other than two biological parents and previous mental health care use as determinants of mental health care use. Regarding family composition, Laitinen-Krispijn et al. (1999) and Sourander et al. (2001) found significant associations with care use, whereas Turner et al. (2007) and within TRAILS (Raven et al., 2018; Reijneveld et al., 2014) only associations were found in specific subgroups (younger children and specialist care, respectively). Only Wichstrøm et al. (2014) did not find an association in 6-year-old children. A possible explanation is that these children did not yet develop problems related to the family composition, but that they are more vulnerable to develop problems throughout childhood.

Previous mental health care use was found to be a determinant by Guterma et al. (2002) and by a subgroup within the Trondheim Early Secure Study (Wichstrøm et al., 2014). The study by Brattfjell et al. (2020) did not find an association. Follow-up time and age did differ between the studies with different conclusions. This might suggest that previous mental health care use predicts current mental health care better when it has been more recent and not during early childhood.

Regarding individual predisposing determinants without an association, we found that children’s age is not associated with care use. However, caution is needed as none of the studies covered an age period longer than 5 years. Studying wider age ranges might show that age is a determinant of care use, e.g. as a result of changes in parental involvement and individual independence throughout childhood. Three of the five studies investigated 16-year-old adolescents over a period of one (Guterma et al., 2002) or five years (Raven et al., 2018; Reijneveld et al., 2014). One of those three did find an association and found that adolescents were more likely to use mental health care compared to young adults (Raven et al., 2018). The fourth study investigated 9–13-year-old children, with a follow-up of one year (Farmer et al., 1999). The fifth study included 6- to 17-year-old children with a follow-up of two years (Turner et al., 2007). However, they stratified the analyses for children (6–9 years) and adolescents (10–17 years). Within those strata, age was not associated with mental health care use. Interestingly, even though this systematic review does not show evidence for age as a determinant, the study by Turner et al. (2007) showed that determinants of mental health care use do differ per age category. Therefore, age was always considered as explaining factor when a determinant was labelled with inconsistent evidence.

We found inconsistent evidence on the association between gender and mental health care use. Interestingly, almost half of the studies on gender identified an interaction between gender and time (Laitinen-Krispijn et al., 1999; Raven et al., 2018; Reijneveld et al., 2014), all suggesting that boys use more mental health care during early childhood and girls use more mental health care during adolescence. Therefore, this inconsistent evidence might be explained by the age of the children at care use. An explanation given by one of these studies is that boys are more likely to start early receiving care since parents of young boys report higher externalising behaviour compared to parents of young girls (Erath et al., 2009).

Also socioeconomic position was labelled with inconsistent evidence

Table 3

Predisposing, enabling and need determinants associated with psychosocial care use in children.

Fit in the model	Determinant	Studies with a significant positive association	Studies without an association	Studies with a Significant negative association	Total positive	Total neutral	Total negative	Total studies/samples	Level of evidence [†]
Contextual predisposing	–				0	0	0	0/0	Not examined
Contextual enabling	Mental health and substance abuse parity		Azrin, 2007		0	1	0	1/1	Little evidence
	Mental health problem screening and colocation policies	Hacker, 2015			1	0	0	1/1	Little evidence
	Screening for mental health problems	Hacker, 2017 (outpatient); Husky, 2011	Hacker, 2017 (emergency department, inpatient, psychotropic medication)		2	1	0	2/2	Good evidence of an association [†]
Contextual need	–				0	0	0	0/0	Not examined
Individual predisposing	Gender (female)	Erath, 2009	Farmer, 1999; Guterman, 2002; Laitinen-Krispijn, 1999 (b); Turner, 2007; Wichstrøm, 2014	Raven, 2018 (b); Reijneveld, 2014 (b)	1	5	2	8/7	Inconsistent evidence [†]
	Age (higher)		Farmer, 1999; Guterman, 2002; Reijneveld, 2014; Turner, 2007	Raven, 2018	0	4	1	5/4	No association [†]
	Rural (vs urban)		Reijneveld, 2014 [‡] ; Turner, 2007		0	2	0	2/2	No association
	High socioeconomic position (SEP)	Amone-P'Olak, 2010 (maternal education, aggregated SEP); Goodman, 2001 (income)	Amone-P'Olak, 2010 (income, occupation and paternal education); Erath, 2009; Farmer, 1999; Goodman, 2001 (education); Guterman, 2002; Reijneveld, 2014 [‡] ; Turner, 2007	Raven, 2018	2	7	1	8/5	Inconsistent evidence [†]
	Poor school performance	Reijneveld, 2014 (childhood)	Guterman, 2002; Reijneveld, 2014 [‡] (adolescence)		1	2	0	2/2	Little evidence [†]
	Combination of deviant peers, and school performance and achievement	Ezpeleta, 2009;			1	0	0	1/1	Little evidence
	Ethnic background (majority group)	Erath, 2009 (a); Guterman, 2002	Reijneveld, 2014 [‡] ; Turner, 2007		2	2	0	4/4	Inconsistent evidence
	High self-competence		Reijneveld, 2014 [‡]		0	1	0	1/1	Little evidence
	Involvement in activities	Laitinen-Krispijn, 1999			1	0	0	1/1	Little evidence
	Family composition (other than two biological parents)	Laitinen-Krispijn, 1999; Raven, 2018; Sourander, 2001; Turner, 2007 (6-9y)	Reijneveld, 2014 [‡] ; Turner, 2007 (10-17y); Wichstrøm, 2014		4	3	0	6/5	Good evidence of an association [†]
	Family functioning	Turner, 2007 (10-17y)	Brattfjell, 2020; Turner, 2007 (6-9y)		1	2	0	2/2	Little evidence [†]
	Any substantial barriers to obtaining care (not further specified)		Farmer, 1999		0	1	0	1/1	Little evidence
	Previous mental health care use	Guterman, 2002; Wichstrøm, 2014	Brattfjell, 2020		2	1	0	3/2	Good evidence of an association [†]
Individual enabling	Being insured	Farmer, 1999			1	0	0	1/1	Little evidence
	Social support by relatives and friends		Reijneveld, 2014 [‡]	Guterman, 2002	0	1	1	2/2	Little evidence
Individual need	Overall problem level	Ezpeleta, 2009; Farmer, 1999; Laitinen-Krispijn, 1999; Rimvall, 2020; Sourander, 2001	Pihlakoski, 2004 [‡]		5	1	0	6/6	Good evidence of an association

(continued on next page)

Table 3 (continued)

Fit in the model	Determinant	Studies with a significant positive association	Studies without an association	Studies with a Significant negative association	Total positive	Total neutral	Total negative	Total studies/samples	Level of evidence [†]
	Externalising behaviour	Brattfjell, 2020 (specialised services); Erath, 2009; Guterma, 2002; Laitinen-Krispijn, 1999; Pihlakoski, 2004; Reijneveld, 2014 (parent-report); Turner, 2007 (10-17y)	Brattfjell, 2020 (community services); Raven, 2018; Reijneveld, 2014 (child-report); Turner, 2007 (6-9y); Wichstrøm, 2014		7	5	0	9/7	Good evidence of an association [†]
	Internalising behaviour	Laitinen-Krispijn, 1999; Raven, 2018 (c); Reijneveld, 2014	Brattfjell, 2020; Pihlakoski, 2004 [‡] ; Raven, 2018 (c); Turner, 2007; Wichstrøm, 2014	Erath, 2009 (a)	3	5	1	8/6	Inconsistent evidence [†]
	ADHD		Brattfjell, 2020		0	1	0	1/1	Little evidence
	Aggressive behaviour	Pihlakoski, 2004	Laitinen-Krispijn, 1999; Turner, 2007		1	2	0	3/3	Inconsistent evidence
	Attention problems		Laitinen-Krispijn, 1999		0	1	0	1/1	Little evidence
	Delinquent behaviour	Laitinen-Krispijn, 1999; Turner, 2007 (10-17y)	Turner, 2007 (6-9y)		2	1	0	2/2	Good evidence of an association [†]
	Depression/anxiety	Goodman, 2001; Guterma, 2002; Ialongo, 2001 (males); Turner, 2007 (depression 6-9y)	Ialongo, 2001 (females); Laitinen-Krispijn, 1999; Pihlakoski, 2004 [‡] ; Sourander, 2001 [‡] ; Turner, 2007 (anxiety and depression 10-17y)		4	5	0	7/6	Inconsistent evidence [†]
	Destructive behaviour		Pihlakoski, 2004 [‡]		0	1	0	1/1	Little evidence
	Psychotic experiences	Rimvall, 2020 (diagnosis of mental disorder)	Rimvall, 2020 (psychotropic medication)		1	1	0	1/1	Little evidence [†]
	Sleep problems		Pihlakoski, 2004 [‡]		0	1	0	1/1	Little evidence
	Social competence		Laitinen-Krispijn, 1999		0	1	0	1/1	Little evidence
	Social problems		Laitinen-Krispijn, 1999		0	1	0	1/1	Little evidence
	Somatic complaints		Laitinen-Krispijn, 1999; Pihlakoski, 2004 [‡]		0	2	0	2/2	No association
	Thought problems		Laitinen-Krispijn, 1999		0	1	0	1/1	Little evidence
	Withdrawn	Laitinen-Krispijn, 1999	Pihlakoski, 2004 [‡]		1	1	0	2/2	Little evidence
	Learning problems	Turner, 2007 (10-17y)	Turner, 2007 (6-9y)		1	1	0	1/1	Little evidence [†]
	Antisocial problems	Sourander, 2001 (parent)	Sourander, 2001 (teacher)		1	1	0	1/1	Little evidence [†]
	Hyperkinetic problems		Sourander, 2001		0	1	0	1/1	Little evidence
	Neurotic problems		Sourander, 2001		0	1	0	1/1	Little evidence
	Impairment/impact	Brattfjell, 2020 (community services); Farmer, 1999 (impact); Guterma, 2002	Brattfjell, 2020 (specialised services); Farmer, 1999 (impairment); Wichstrøm, 2014		3	3	0	4/3	Good evidence of an association [†]
	Irritability	Dougherty, 2015 (outpatient)	Dougherty, 2015 (psychotropic medication)		1	1	0	1/1	Little evidence [†]
	Being bullied	Evans-Lacko, 2017			1	0	0	1/1	Little evidence
	Victimisation		Turner, 2007	Guterma, 2002	0	1	1	2/2	Little evidence
	Chronic disease		Sourander, 2001 [‡]		0	1	0	1/1	Little evidence

[†] See Table 1. When within one study or one study sample (TRAILS, Add Health and Trondheim Early Secure Study) a significant association was found, this was leading in the level of evidence, also when this association was not found in all sub samples. [‡]Not in final model. (a)Interaction between ethnic background and internalising behaviour; at high levels of internalising behaviours, children with a European American background were more likely to use care than were children with African American backgrounds. At low levels of internalising behaviour, children with an African American background were more likely to use care than were children with a European American background. (b)Interaction with time; boys used more care in early adolescence and girls in later adolescence. (c)Significant association for child report at 16 years, parent report at 13 years, and teacher report at 11 and 13 years. Not significant for child report at 11 and 13 years, parent report at 11 and 16 years, and teacher report at 16 years.

based on five study populations (3 out of 8 studies found an association). Socioeconomic position was by most studies measured using a combination of parents' educational level, occupation and income (Amone-P'Olak et al., 2010; Erath et al., 2009; Raven et al., 2018; Reijneveld et al., 2014; Turner et al., 2007). The other studies focused on education and/or income separately (Farmer et al., 1999; Goodman & Huang, 2001; Guterma n et al., 2002). No pattern was found in studies that did and did not find an association. Goodman and Huang (2001) found income to be associated with mental health care use, but not educational level of the highest educated parent. Whereas Amone-P'Olak et al. (2010) found that educational level of the mother and aggregated socioeconomic position were associated, but not educational level of the father and occupation. Moreover, findings were inconsistent regarding ethnic background. We did not find an explanation for this inconsistency based on the age of the population, type of mental health care or country of study.

On the level of individual enabling determinants, only little evidence was available. Two studies were found in which the association of social support that a child experiences was examined and with mixed results (negative association and no association) (Guterma n et al., 2002; Reijneveld et al., 2014). Furthermore, only little evidence was available on being insured (Farmer et al., 1999). A possible explanation for the limited evidence might be that in some countries, e.g. the Netherlands, Norway and Sweden, all children are insured for mental health care. Therefore, studying insurance in those countries is less relevant.

On the level of individual need determinants, overall problem level, externalising behaviour, delinquent behaviour and impairment/impact were identified as determinants of mental health care use. Regarding externalising behaviour, an association was in some studies only identified for specific reporters or subgroups. For example, parent-reported externalising behaviour was associated with care use, according to Reijneveld et al. (2014), but child-reported externalising behaviour was not associated. Similarly, in the study by Turner et al. (2007), externalising problems were associated with mental health care use in 10–17-year-old children, but not in 6–9-year-old children. Brattfjell et al. (2020) found an association only with specialised services and not with community services. Furthermore, aggressive behaviour – a subtype of externalising behaviour – showed inconsistent evidence for an association with care use (Laitinen-Krispijn et al., 1999; Pihlakoski et al., 2004; Turner et al., 2007). Interestingly, the study that reported an association did not adjust for other types of problems (Pihlakoski et al., 2004), whereas the studies that did not find an association did adjust for other types of problems (Laitinen-Krispijn et al., 1999; Turner et al., 2007). Therefore, we might conclude with caution that externalising behaviour is associated with mental health care use, but that aggressive behaviour is interrelated with other types of problems and is not independently related to care use.

Impairment and impact is another determinant in this systematic review labelled with 'good evidence'. Even though impact and impairment are two different concepts, in this systematic review, they were combined because both represent the influence of mental health problems on the child. Impairment can be defined as deterioration in functioning and impact as how this impairment affects the child and its environment (Brattfjell et al., 2020; Farmer et al., 1999; Guterma n et al., 2002; Wichstrøm et al., 2014). Also, delinquent behaviour was labelled with 'good evidence'. In two studies, a positive association was found in adolescents (Laitinen-Krispijn et al., 1999; Turner et al., 2007). In the same study by Turner et al. (Turner et al., 2007), stratified analyses show that delinquent behaviour was not associated with care use in children under the age of 10 years. A possible explanation is that delinquent behaviour often starts in adolescence (Sullivan, 2006). So this could imply that in early childhood delinquent behaviour is less severe and, therefore, no help is needed or that the age of onset in early childhood is not reached yet.

Regarding internalising behaviour, we find inconsistent evidence. The studies that found a positive association between internalising

problems and mental health care use studied adolescents only (Laitinen-Krispijn et al., 1999; Raven et al., 2018; Reijneveld et al., 2014). The other studies included children as well or focused on children only; They did not find an association (Brattfjell et al., 2020; Pihlakoski et al., 2004; Turner et al., 2007; Wichstrøm et al., 2014) or even a negative association (Erath et al., 2009). Therefore, the association between internalising behaviour and mental health care use might also be age-dependent.

In total, we found six determinants with inconsistent evidence. Based on study population, age, type of mental health care or country of the studies, we were not able to fully explain these inconsistencies. This implies that other factors probably play a role. The inconsistencies might also be explained by the fact that we only included population-based studies. In more detail, associations might exist within specific subgroups but are masked in the general population. This suggestion is in line with some of the included studies as they show that certain associations are only present in specific subgroups (Ialongo et al., 2001; Raven et al., 2018; Turner et al., 2007). Furthermore, we compared many results which implies that some findings are based on chance (Block, 1960). On seventeen other individual need determinants, mostly different types of problems, only little evidence was available due to the low number of studies investigating each type.

5. Strengths and limitations

To our knowledge, this is the first systematic review on the individual and contextual determinants of mental health care use in children. In this review, only longitudinal studies are included to increase the likelihood of the studied factor to be a determinant of mental health care use and to ensure the quality of the included studies. This approach has led to inclusion of high-quality studies only, according to the criteria by Kmet et al. (2004). Another strength is that only population-based studies are included, which increases the generalisability and enables broader implications for policies to improve access to care on the population level.

However, some limitations should be considered as well. To start with, the type of mental health care use differs per study as well as the period wherein the care use took place. This might have enlarged the number of determinants with inconsistent findings. For example, a determinant could be associated with community services but not with specialised services. Furthermore, our findings might be influenced by publication bias. Statistically significant findings and positive findings are more likely to get published compared to non-significant findings (Dwan et al., 2013). Lastly, it is important to realise that applying different criteria as a level of evidence or counting studies instead of study samples might lead to different conclusions.

6. Practical implications and future research

Several implications can be drawn from this systematic review. First of all, we found that overall problems and externalising behaviour, but not internalising behaviour, were associated with care use. We, therefore, recommend health professionals to pay extra attention to those children and adolescents who might suffer from internalising problems. Secondly, screening for mental health problems at schools and well-child visits is associated with increased mental health care use. Professionals and teachers could use validated tools to screen all children regularly, which helps to identify and refer those in need for care. We encourage health professionals and teachers to use their crucial position in improving access to care for children in need.

Future research is highly recommended since our review shows that the evidence for determinants of mental health care use is often limited or inconsistent and mainly focuses on adolescents. We recommend future research to focus on specific types of problems. Insight is needed in the lack of a clear association of certain types of problems with mental health care use in order to improve access to and provision of care. Furthermore, more standardised research is needed in this field to

increase the generalisability and comparability of the findings. Our suggestions are to use clear descriptions of the care that is investigated, to use determinants that are assessed before the outcome measure, correct for the severity of the overall problem level and to include non-significant findings in the final model. Via the latter, we can increase the body of evidence of factors that are not related to mental health care use. Furthermore, more insight is needed in factors like gender, socioeconomic position and ethnic background since the evidence was inconsistent. When studying these determinants, we recommend to include children under the age of twelve in the study sample since most studies focus on adolescents.

Furthermore, based on the Behavioural Model by Andersen et al. (2013), some determinants are underrepresented in the literature. Contextual predisposing determinants and contextual need factors, e.g. the socio-demographic composition of a neighbourhood and population health indices, are not studied in population-based, longitudinal studies. These studies could help to target the neighbourhoods that need it most. Also enabling determinants on the contextual and individual level are relatively less studied compared to the individual predisposing determinants and the individual need determinants. These determinants enable to improve care use on a broader level than the individual level, for example, via governmental or national actions.

7. Conclusions

In summary, screening for mental health problems, not living with two biological parents and previous mental health care use were identified as determinants of children's mental health care. Whereas overall problems and externalising behaviour were associated with care use as well, the association with internalising problems was unclear. Furthermore, delinquent behaviour and impact/impairment were labelled as determinants of mental health care use. More insight is needed in factors for which inconsistent evidence was found, including gender, socioeconomic position and ethnic background. Thereby, population-based, longitudinal research on the contextual level was scarce. Further research is needed to better understand the determinants of children's and adolescents' mental health care use in order to decrease the discrepancies in mental health care use and facilitate earlier intervention.

CRedit authorship contribution statement

D.G.M. Eijgermans: Conceptualization, Methodology, Writing – original draft. **Y. Fang:** Writing – review & editing. **D.E.M.C. Jansen:** Conceptualization, Writing – review & editing. **W.M. Bramer:** Methodology, Writing – review & editing. **H. Raat:** Conceptualization, Supervision, Writing – review & editing. **W. Jansen:** Conceptualization, Supervision, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Funding

This study is made possible by funding of the Department of Social Development of the city of Rotterdam. The funding department of the city was not involved in any part of the process of this systematic review.

Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.childev.2021.106288>.

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