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ORIGINAL CONTRIBUTION

The multidisciplinary depression guideline for children and adolescents: an implementation study

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Abstract It is important that depressed patients receive adequate and safe care as described in clinical guidelines. The aim of this study was to evaluate the implementation of the Dutch depression guideline for children and adolescents, and to identify factors that were associated with the uptake of the guideline recommendations. The study took place in specialised child and adolescent mental healthcare. An implementation project was initiated to enhance the implementation of the guideline. An evaluation study was performed alongside the implementation project, using structured registration forms and interviews with healthcare professionals. Six multidisciplinary teams participated in the implementation study. The records of 655 patients were analysed. After 1 year, 72 % of all eligible patients had been screened for depression and 38 % were diagnosed with the use of a diagnostic instrument. The severity of the depression was assessed in 77 % of the patients during the diagnostic process, and 41 % of the patients received the recommended intervention based on the depression severity. Of the patients that received antidepressants, 25 % received weekly checks for suicidal thoughts in the first 6 weeks. Monitoring of the patients' response was recorded in 32 % of the patients. A wide range of factors were perceived to influence the uptake of guideline recommendations, e.g. the availability of capable professionals, available time, electronic tools and reminders, and the professionals' skills and attitudes. With the involvement of the teams, recommendations were provided for nationwide implementation of the guideline. In conclusion, a systematic implementation programme using stepped care principles for the allocation of depression interventions seems successful, but there remains room for further improvement.

Keywords Qualitative research · Depression · Implementation · Guidelines · Children · Adolescents

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Introduction

Depression is the most prevalent mood disorder in children and adolescents. A meta-analysis showed higher rates of depression in adolescents than in children; the prevalence estimates were 2.8 % for children under 13 years and 5.6 % for adolescents 13–18 years old [1]. In pre-pubertal children, there was no sex difference in prevalence, whereas in post-pubertal children the prevalence in girls was higher than that of boys; in adolescents of 13–18 years, depression was more prevalent in girls (5.9 %) than in boys (4.6 %). Epidemiological studies show that a large proportion of depressed children and adolescents in the general

Table 1 The key issues addressed in the depression guideline for children and adolescents

Screening	Depressed young people will not describe their symptoms readily or easily, even to their parents. The guideline recommends the use of screening instruments for psychopathology in children and adolescents
Diagnosis	Depressive illness should only be diagnosed when the signs and symptoms lead to significant personal suffering and are accompanied by observable social impairment. Criteria for the different severity levels of depression, mild, moderate or severe, are based on DSM-IV-R criteria [36]. The diagnosis of mild depression is made when depressed mood (or irritability), with either anhedonia or tiredness, is experienced in conjunction with 3–4 further symptoms from a list of nine symptoms commonly associated with depression (i.e. a total of 5–6 symptoms). Both the mood change and concurrent symptoms must persist for at least 2 weeks. For moderate depression, the number of symptoms is increased to at least 6–8, and for severe the number increases to eight or nine. Depression in children and young people tends to occur in conjunction with other detectable problems or comorbidity. Therefore, the diagnosis requires clinical skills and time to elicit. The depression guideline for children and adolescents recommends the use of semi-structured interviews for psychopathology in the diagnostic process
Severity assessment	To allocate stepped care adequately, it is necessary to identify depressed patients timely and assess the severity of the depression diagnosis. The guideline recommends assessing the depression severity with a clinical judgement based on a combination of rates on the following variables: number of symptoms according to DSM-IV-TR, presence of psychotic symptoms or suicidal tendencies, CDI-27 score, GAF score, and number of daily life domains in which the illness interferes
Stepped care treatment	When a depression diagnosis is established, the depression guideline for children and adolescents recommends a stepped care approach. The guideline offers a range of several effective treatments. Depending on the severity of the depression, a treatment is allocated, starting with the least intensive treatment that is still expected to generate effect. Patients with mild depression are offered interventions of low intensity (such as psychoeducation and running therapy). More intensive treatment options are appropriate for patients who do not successfully respond to low-intensity interventions, or for patients who are more severely depressed. Patients with moderate depression are therefore offered interventions of a higher intensity (psychoeducation in combination with cognitive behavioural therapy or with interpersonal therapy). Patients with severe depression are offered as a first-choice treatment a combination of cognitive behavioural therapy and antidepressants (fluoxetine)
Monitoring	The guideline recommends assessing the severity of the depression and monitoring the patients' symptoms to determine the response. If response is insufficient, it may be necessary to step up to a more intensive treatment. In patients who receive antidepressants, the risk of suicide should be assessed weekly in the beginning. In all cases, treatment should be continued until remission of the depressive symptoms occurs. Then booster sessions that focus on relapse prevention should be provided

population remain undetected [2]. Even in specialised child mental healthcare, depressive signs and symptoms may be missed due to cursory inquiry or because greater attention is paid to other concurrent problems in the child or family [3, 4].

The strongest risk factors for depression in adolescents are a family history of depression and exposure to psychosocial stress [5]. Depressive disorders in children and adolescents can lead to various negative lifelong consequences. It hinders them in effectively carrying out development tasks, and it can have a detrimental effect on their school performance, social life, and ultimately on their professional achievements [6]. Depression at a young age increases the likelihood of depression in later life. Moreover, children and young people who have had depression often have other problems, such as unruly or withdrawn behaviour and problematic substance use [7]. Depression also leads to an increased rate of smoking, substance abuse and obesity [8, 9]. Depression has a high burden of disease [10], and the most serious complication of depression in adolescents is suicide [11]. Therefore, it is important to recognise and treat this disorder.

Several countries have developed depression guidelines for children and adolescents in specialised mental healthcare, e.g. the UK, Australia, and the US [12–14]. A guideline has also been developed in the Netherlands and was released in 2009 [15]. Key aspects of clinical management addressed in the guideline are: screening, diagnosis, severity assessment of depression, treatment, and monitoring of treatment response (see Table 1). The recommendations reflect a stepped care approach: depending on the severity of the depression, a treatment is allocated, starting with the least intensive treatment that is still expected to generate effect. Patients with mild depression are offered interventions of low intensity (e.g. psychoeducation). More intensive treatment options are appropriate for patients who do not successfully respond to low-intensity interventions, or for patients who are more severely depressed. Patients with moderate depression are therefore offered interventions of a higher intensity (psychotherapy), and with severe depression they are offered a combined intervention (psychotherapy and antidepressants). To allocate stepped care adequately, depressed patients must be identified timely and the severity of the depressive symptoms needs to be

assessed. Monitoring of the patients' symptoms is needed to decide when to step up to a more intensive treatment.

The guideline recommendations were based on consensus in the guideline development group and relied on three sources: scientific evidence, experts' opinions, and patient preferences. Some recommendations have a strong evidence base, while others rely more on the consensus of clinicians and patient representatives. Consensus is influenced by the culture, values, and resources of the country where the guideline is developed. This explains why recommendations may differ throughout guidelines across the world, although the international evidence underlying these guidelines is similar. Overall, the recommendations in the Dutch guideline are comparable to the recommendations in the US, UK and Australian guidelines [12–14]; all guidelines are based on stepped care principles and recommended a comprehensive psychiatric diagnostic evaluation; no antidepressant medication is recommended in mild depression, and when antidepressants are prescribed, the guidelines recommend careful monitoring of adverse events and of the patient's clinical response. There are also some differences. The Dutch guideline is more specific than the other three guidelines in its recommendations regarding screening, diagnosis, and monitoring of the patient's response (the Dutch guideline recommends specific instruments and diagnostic interviews). Moreover, compared to the other guidelines, the Dutch guideline recommends relatively low-intensity treatments as a first-step treatment in patients with mild depression (such as running therapy, watchful waiting, and psychoeducation).

Research into the implementation of guidelines shows that disseminating guidelines is crucial, but often insufficient for the actual application in practice [16]. International studies show that there is a gap between guideline recommendations and daily clinical practice [17, 18]. One study found that some patients were receiving medication without the recommended psychological therapy [17]; another found that too many patients were prescribed an antidepressant before psychotherapy treatment was undertaken, or were not monitored for depression symptom improvement and antidepressant treatment-emergent suicide-related behaviours [18]. The American Food and Drug Administration (FDA) issued an advisory on the frequency of visits for paediatric patients treated with antidepressants, with the purpose of monitoring treatment response and adverse effects. The frequency of visits did not increase, contrary to expectations [19].

Implementation of complex treatment approaches, such as stepped care, depends on a complex interplay of factors. Barriers in different domains have to be overcome, which may be related to the innovation itself (in this case, the depression guideline for children and adolescents), to the individual professional, the patient, the organisational context, and/or the economic and political context [20]. Examples of barriers in the professional domain include not being familiar with the guideline, being unsure about one's capacities to apply the guideline recommendations, or having reservations about diagnosing young people with a major depressive disorder. Possible barriers in the innovation are the legitimacy of depression as a diagnosis in childhood and adolescence and the safety of antidepressants. In patients, treatment adherence is a possible barrier for implementation. Absence of training, and too little time to apply the recommendations in daily practice can be organisational barriers. Training and supervision in evidence-based treatments seem to be an important precondition to deliver high-quality care [21].

In the Netherlands, mental healthcare organisations specialising in the treatment of children and adolescents do not seem to implement guideline recommendations on evidence-based interventions systematically [22]. Therefore, an implementation project was carried out. We used the Grol and Wensing model for systematically planned implementation [23], which is informed by a range of theories on change of behaviour and organisations (see the "Methods" for a more extensive description of the model used in our study).

An evaluation study was executed alongside the implementation project with two main objectives. The first was to determine the degree of uptake of recommendations in the depression guideline for children and adolescents after completing an implementation project in specialised mental healthcare organisations for children and adolescents. The second was to identify factors that influenced the uptake of guideline recommendations, and to provide recommendations for nationwide implementation of the guideline, based on the experiences of the participating mental healthcare professionals.

Methods

Study design

For the first study objective, a quantitative observational study design was applied. For the second study objective, a qualitative study design was applied.

We followed the STROBE statement [24] in our reporting and, in addition, RATS [25] for the qualitative study. STROBE is an acronym of strengthening the reporting of observational studies in epidemiology; RATS is an acronym of relevance, appropriateness of qualitative method, transparency of procedures and soundness of interpretive approach. The Dutch Medical Ethics Committee for Mental Healthcare (METiGG) waived approval for the study.

Table 2 Overview of implementation interventions

Professionals
A national expert team was formed to address depression in children and adolescents, and quality improvement of depression care
A national network of multidisciplinary teams was compiled for exchange of ideas between the teams and to enhance the learning process
Local team coordinators supported the team by structuring the local implementation process
A digital network environment was provided for exchange of best practices and online discussion
Teams were trained in the breakthrough method
Two national conference meetings were organised for the teams
In the first, the participating teams learned about the key recommendations in the guideline and how to implement them in clinical practice, and were stimulated to make local implementation plans
In the second, at the end of the QIC, the teams were stimulated to further improve the implementation process
Indicators on key guideline recommendations were pre-specified by the national expert team to monitor effects, and enable the use of the plan-do-study-act (PDSA) cycles, which helps to move the implementation process forward [37, 38]
All individual professionals of the teams received a depression toolkit consisting of the depression guideline for children and adolescents, information on the indicators, information on screening and diagnostic instruments, forms to enhance a systematic approach of the QIC, and patient registration forms on all the indicators
The national expert team provided
Team visits and additional supportive telephone contact
Advice on how to formulate implementation goals that were specific, measurable, attainable, realistic, and timely (SMART)
Tailored advice based on the diagnostic analyses
Feedback on implementation plans and data charts
Tailored implementation interventions as advised by the expert team were: train the professionals in the use of the recommended diagnostic instruments, in the effects and dosing of pharmacotherapy, and/or in initiating a conversation with patients on suicidal thoughts
Patients and carers
Tailored implementation interventions as advised by the expert team were: provide local leaflets and/or information on the organisation's website with regard to the depression treatment policy
Organisations
Tailored implementation interventions as advised by the expert team were
Actively involve the higher management of the organisation
Discuss the uptake of the guideline recommendations in team meetings
Install reminders in the electronic patient records to enhance the uptake of guideline recommendations
Include treatment innovations in the organisation's treatment policy
Consider reallocation of tasks
Disseminate knowledge and experiences through local conferences and leaflets

Participants

A convenience sample of treatment teams was included. Specialised child and adolescent mental healthcare teams, working in specialised mental healthcare organisations in the Netherlands were recruited through the network of the experts and researchers involved in this study. Their anonymity and confidentiality were ensured. Six multidisciplinary teams volunteered, consented to and participated in the study.

Implementation project

The model for systematically planned implementation [23] was adapted for the present study into the following six steps: (1) select five key recommendations from the Dutch depression guideline for children and adolescents [15]; (2) define indicators for the five key recommendations, and measure performance on those indicators in local specialised mental healthcare teams; (3) analyse factors influencing the implementation by interviewing the participating teams (diagnostic analysis); (4) carry out an quality improvement collaborative (QIC), supplemented with tailored advice from a national expert team as strategies for implementation; (5) design local implementation plans; (6) measure the performance on the indicators, and evaluate the process of implementation in the teams by identifying factors that influenced the uptake of the guideline recommendations.

The QIC in step (4) was designed as a 'breakthrough' QIC [26, 27]. The implementation process within a breakthrough QIC is encouraged by a series of structured interventions in a given time frame. The structured interventions offered to the participating teams during

Table 3 Ten indicators representing adherence to the depression guideline for children and adolescents

	Indicator	
1.	Screening	
	Use of a screening tool (CBCL, YSR, SDQ or SPsy)	
2.	Diagnosis	
	Use of a semi-structured interview for the diagnosis of depression (the K-SADS or ADIS-C/P), or the self-report questionnaire CDI (at least twice within 2 weeks)	
3.	Severity assessment	
	Application and registration of a structured assessment of the severity of the depression (mild, moderate, severe), based on a severity schedule (number of DSM-IV symptoms, suicidality assessment and/or psychotic features, CDI score, GAF score, and number of life domains in which the depression interfered)	
4.	Stepped care treatment	
4a.	Mild depression	In mild depression, apply a first-step intervention (psychoeducation, running therapy, bibliotherapy, watchful waiting)
4b.	Moderate depression	In moderate depression, apply psychotherapy (IPT or CBT)
4c.	Severe depression	In severe depression, add antidepressants (fluoxetine) to CBT
4d.	Evaluation suicide risk	When antidepressant medication is prescribed, check for suicidal thoughts or behaviours weekly in the first 6 weeks of treatment
5.	Monitoring treatment response and reallocation of treatment	
5a.	Monitoring response	In first-step interventions: monitor the response after 4–8 weeks (preferably with the CDI)[a]
5b.	Monitoring response	In psychotherapy and/or medication: monitor the response after 10–14 weeks (preferably with the CDI)[b]
5c.	Treatment reallocation	If the response is insufficient, switch to a more intensive treatment

The SPsy contains the SDQ and items about eating disorders, alcohol and drug use, psychotic features and self-destructive behaviour (self-mutilation and self-destructive behaviour) [44]

ADIS-C/P anxiety disorder interview schedule, child and parent version [39], *CBCL* child behaviour checklist (4–18 years) [40], *CBT* cognitive behavioural therapy, *CDI* children's depression inventory (7–17 years) [41], *DSM-IV* diagnostic and statistical manual of mental disorders, version IV [36], *GAF* global assessment of functioning [36], *IPT* interpersonal therapy, *K-SADS* the anxiety disorders interview schedule for DSM-IV—child and parent version [42], *SDQ* strengths and difficulties questionnaire (4–16 years) [43], *SPsy* screening instrument mental disorders (12–18 years, in Dutch), *YSR* youth self-report (11–18 years) [40]

[a] The guideline recommends after 4–6 weeks

[b] The guideline recommends after 3 months

the implementation project for the present investigation are listed in Table 2. Evidence indicates that QICs may improve healthcare [28, 29].

General QIC implementation interventions were supplemented with tailored advice from the expert team, to overcome barriers identified by the teams [30]. Factors influencing the implementation were obtained from a diagnostic analysis, by interviewing a manager and an experienced professional from each team. A semi-structured interview was used, based upon the consolidated framework for implementation research (SFIR) [31]. This framework contains five domains: intervention characteristics, outer setting, inner setting, characteristics of individuals, and implementation process. Key facilitating factors and barriers were identified per team, and tailored advice was given based upon suggestions from the SFIR article and the expert opinion of the expert team. The barrier that most teams mentioned in the diagnostic analysis was: too little knowledge and skills with regard to the use of screening instruments and semi-structured diagnostic interviews, severity assessment and treatment indication based on stepped care principles and on evaluating the treatment effects. Other barriers mentioned by most teams were: problems with planning and logistics, lack of time, lack of qualified staff, and registration problems (i.e. not all relevant information could be registered in the electronic patient records). Overall, the implementation advice of the experts was quite comparable across the teams. Tailored advice on interventions to overcome the barriers, both for professionals and for the teams or organisations, is listed in Table 2. The teams took the advice of the expert team into account when they designed their local implementation plan.

Measures: process indicators

The national expert team formulated a set of process indicators, based on five key guideline recommendations (see Table 3). These process indicators represent, in general, optimal care. The indicators were used as an indication of

Table 4 Targeted behaviour for the implementation of the depression guideline for children and adolescents

1.	Screening	
	The team or organisation sends a screening tool to all patients who enter the mental health organisation	
	The professional looks at the results of the screening tool before the intake, and discusses the results with the patient	
	Results of the screening tool are registered in the electronic patient record	
2.	Diagnosis	
	When internalised problems are suspected, based on results of the screening tool, the professional uses a semi-structured interview to establish a diagnosis of depression	
3.	Severity assessment	
	The professional applies a structured assessment of the severity of the depression	
	Results of the severity assessment are registered in the electronic patient record	
	Results of the severity assessment are discussed at the multidisciplinary team meeting	
4.	Stepped care treatment	
4a–c.	Mild, moderate and severe depression	Results of the severity assessment are used as input for the treatment plan
		The results of the severity assessment are discussed with the patient, and how they relate to the choice for a specific intervention
4d.	In antidepressant treatment	When antidepressant medication is prescribed to the patient, the suicide risk is evaluated weekly by the professional
5.	Monitoring treatment response and reallocation of treatment	
5a.	Monitoring response in first-step interventions	After 4–8 weeks treatment with a first-step intervention, the clinician evaluates whether the treatment response is sufficient (score on CDI <16 and/or RCI >1.96[a])
5b.	Monitoring response in psychotherapy and/or medication	After 10–14 weeks treatment of psychotherapy and/or medication, the clinician evaluates whether the treatment response is sufficient (score on CDI <16 and/or RCI >1.96[a])
5c.	Treatment reallocation	When the treatment response is not sufficient, reallocation of treatment is considered and registered by the clinician

[a] The reliable change index score (RCI score) is calculated as follows: the CDI difference score (pre-post) is divided by the standard deviation of the test. An RCI >1.96 indicates a positive change

the degree of uptake of the guideline recommendations, and covered the following aspects of clinical management: case finding through screening, diagnosis, severity assessment, treatment and monitoring of suicide risk, and monitoring of treatment outcomes. Behaviours that were targeted in the teams to improve performance on the indicators are presented in Table 4.

Data collection

The study was conducted parallel to the implementation project to improve on the five themes of depression care, and data collection took place from June 2012 to June 2013.

Registration forms and patient records

For our first research objective on the degree of implementation, registration forms based on the set of indicators were developed for the professionals to collect data prospectively. For indicators 2–5, the teams were requested to complete registration forms for each patient who was referred to their team during the implementation project. The registration forms contained questions as to whether a diagnostic interview was used (and if so, which one; if not, which other approach was used); how the severity assessment took place and what the outcome was; when a treatment had started and what type of treatment was provided; when the monitoring of the treatment response took place, what instrument was used and what the outcome was; and when the suicide risk was monitored, what monitoring instrument was used and what the outcome was. In case of missing data, the team secretary checked the electronic patient record and filled in the appropriate registration forms to ensure that all data on all patients with depression were included in the study.

To collect data for the first indicator (the use of screening tools in patients who were not yet identified as depressed), a different method was used. The reason for this was that screening for depression did not take place within the teams, but before they were referred to the teams. Around July 2013, the team secretaries selected a random sample of all registered patients who had been referred to the mental healthcare organisation (not only to the participating

team) and who had received any diagnosis, depression or otherwise. The random sample was selected by simply rolling dice. If, for example, the dice gave number 2, every second patient was selected until the sample consisted of a minimum of 70 patients. Subsequently, the team secretaries checked all selected files and noted for each patient whether one of the recommended screening instruments was used.

Interviews

For our second research objective, the data collection consisted of face-to-face, semi-structured interviews with the teams. The interviews were conducted at the end of the implementation project to get an insight into the factors associated with the uptake of guideline recommendations during the implementation project. Interviews seemed an appropriate research method to address the experience of the teams with the implementation process. Examples of interview questions were "To what extent did the team succeed in applying the recommendations of the guideline?", "What was the biggest challenge?", What was the smallest accomplishment?", "How did you succeed in making these quality improvements?", and "What would you advise if these guideline recommendations were to be implemented nationwide?". The interviews took place in May and June 2013, nearly 1 year after the start of the implementation project. The interviews took place at each team's organisation separately, lasted for about 75 min, and were conducted by two researchers (HS and AM, who were both researchers involved in guideline development and guideline implementation research, and who were not working as clinicians).

Based on the interviews with the teams, the investigators formulated draft recommendations for nationwide implementation of the guideline. During the second national conference meeting at the end of the implementation project, the teams were invited to comment on these draft recommendations. These comments were used to formulate a final set of recommendations as a guidance for the nationwide implementation of the guideline.

Data analysis

One researcher (MO) extracted the data from the registration forms and imported the data to Microsoft Excel, of the Microsoft Office 2007 software package. The data were analysed with descriptive statistics, and the results on the process indicators are presented on a patient level. The proportion of patients who received care according to the indicators was calculated by dividing the number of patients who received care according to the indicator to the total number of patients appropriate for that indicator. Overall, we calculated the proportion (%) and the range (variation in the proportion within the teams) of patients (1) who were screened, (2) who were diagnosed according to the guideline recommendations, (3) whose depression severity was assessed, (4) who were allocated to the appropriate first-step treatment, and (5) whose treatment response was monitored as recommended in the guideline.

The interviews were digitally recorded and transcribed verbatim. To order the data, thematic coding was used with the support of MAXQDA [32], a software programme for qualitative analysis. The themes were factors that influenced the performance of the teams on the indicators. To generate questions for subsequent interviews, two experts commented on the transcript of the first two interviews, and two researchers (HS and AM) performed a content analysis. Also, text fragments were coded independently by the two researchers and compared on agreement and differences. Based on these first two interviews, a coding tree was built around the indicators, and all the text fragments were coded by one of the researchers (AM). The analysis was descriptive in nature.

Results

Six multidisciplinary teams, consisting of 64 professionals specialised in mental health problems in children and adolescents participated in this study. Their patients were children and adolescents with depression or with other mental health problems. Teams generally consisted of a manager and 5–10 healthcare professionals: a child psychiatrist, psychologist, psychotherapist, system therapist, social psychiatric nurse and/or social worker.

The records of 655 patients were analysed: 441 patients of the mental healthcare organisations to evaluate indicator one (mean number of patients per team was 74, range 71–75 patients), and 214 patients who were referred to the team during the study period to evaluate indicators 2–5 (mean number of patients per team was 36, range 23–48 patients). Of these 214 patients, 22 were 11 years or younger, 168 were between 12 and 18 years of age, and 24 patients were between 19 and 21 years. The results per indicator are presented below, and in Fig. 1, the scores on the indicators are presented graphically on the highest aggregated level.

Indicator 1: screen for psychopathology

After 1 year, 72 % of all registered patients ($N = 441$) were screened for depression (33–95 %) with one of the recommended screening tools (see Table 3 for the indicator on screening). Patients were requested to complete the screening instrument before the intake interview. However, not

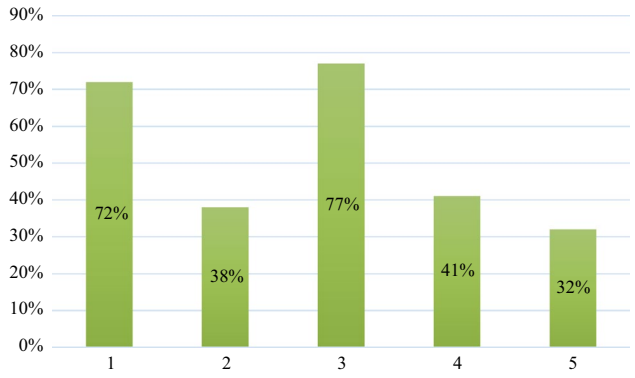

Fig. 1 Results of the indicators (in %) for each of the five key recommendations. *1* Screening (mean 72 %, $N = 441$). *2* Diagnosis (mean 38 %, $N = 214$). *3* Severity assessment (mean 77 %, $N = 165$). *4* Stepped care intervention (mean 41 %, $N = 150$). *5* Monitoring of treatment response (mean 32 %, $N = 166$)

all patients completed the screening instrument at home (a barrier in patients). The inclusion of the screening instrument in the routine outcome monitoring (ROM) procedures facilitated its use (a facilitator in the organisation).

Indicator 2: use a semi-structured interview to diagnose depression

This indicator represents the degree of adherence to the use of semi-structured interviews for depression diagnosis [the anxiety disorders interview schedule for DSM-IV, child and parent version (K-SADS), the anxiety disorder interview schedule, child and parent version (ADIS-C/P)], or the children's depression inventory (CDI), a self-report questionnaire (see Table 3 for the indicator on diagnosis). Of all patients ($N = 214$) who were seen by the professionals of the team, 38 % (0–59 %) were diagnosed with the use of a semi-structured interview or with the CDI administered twice within 2 weeks; the CDI was administered in 21 % of patients, and the ADIS-C/P was administered in 17 %. None of the teams implemented the K-SADS.

The self-report CDI was implemented more often than the semi-structured interview K-SADS or ADIS-C/P. A reason for this was that the teams found the CDI relatively easy to administer. Implementation of the K-SADS was hampered by the difficulties in organising training for its use (a barrier in the organisation). The teams experienced the ADIS-C/P as very thorough; it helps not only in diagnosing depression but also in classifying other mental disorders that are often either comorbid with depression or suggest differential diagnoses to consider. They thought that the ADIS-C/P could be helpful when there is uncertainty about the diagnosis. The teams perceived the ADIS-C/P, and also the K-SADS, as a complex instrument that required excessive time to administer (an organisational barrier). Some teams also found that the ADIS-C/P left little room for expression of the patient's emotions (barrier in the innovation), and found some of the standard questions rather intrusive (barrier in the professional domain).

Indicator 3: assess the severity of the depression

The depression severity was assessed in 77 % ($N = 165$, range 68–87 %) of patients (see Table 3 to for the indicators on severity assessment). In 150 patients (70 % of all patients, range 35–86 %), this led to the classification of mild, moderate or severe depression. Most teams indicated that assessing the severity was fairly easy to implement; the professionals were well aware of the severity criteria (a facilitator in the professional domain), and they found that using the registration form developed for the severity assessment was very stimulating (a facilitator in the organisation). Implementation of the severity assessment was also stimulated by discussing the severity of the depression and, subsequently, the treatment indication in the team meetings (a facilitator in the organisation).

Indicator 4: provide stepped care treatment

Of the 150 patients with mild, moderate or severe depression, 41 % received the recommended stepped care intervention (see Table 3 for the indicators on treatment).

Overall, patients with moderate depression received the recommended intervention more often than patients with severe depression. In patients with mild depression ($N = 31$), 33 % ($N = 10$, range 0–50 %) received a recommended first-step intervention (psychoeducation, running therapy, bibliotherapy, or watchful waiting). In patients with moderate depression ($N = 76$), 66 % ($N = 50$, range 38–88 %) received the recommended intervention of interpersonal therapy (IPT) or cognitive behavioural therapy (CBT). Although this was not recommended, 7 % of moderately depressed patients received a selective serotonin reuptake inhibitor (SSRI) ($N = 5$, range 0–33 %). In patients with severe depression ($N = 43$), 2 % (only one patient) received the recommended combination therapy of CBT and psychopharmaca. Most other patients with severe depression received a single intervention; 59 % ($N = 26$) received CBT and 22 % ($N = 9$) received SSRI medication (of whom seven received the recommended fluoxetine). Of all patients (moderately or severely depressed, or patients whose depression severity was not assessed) who received antidepressants ($N = 43$), 25 % (0–79 %) received weekly checks for suicidal thoughts in the first 6 weeks.

When teams assessed the severity of the depression, they felt able to match the recommended treatment to the depression severity (a facilitator in the guideline). The teams were more aware that treatment allocation depends

on the depression severity (a facilitator in the professional domain). In mild depression, they did not have to provide interventions of high intensity, and in severe depression, the teams were less hesitant to provide fluoxetine. Some teams had become more aware of the importance of checking for suicidal thoughts (a facilitator in the professional domain). When teams were trained in checking suicidal thoughts (a facilitator in the organisation), they felt less inhibited in discussing this with patients. The teams were positive about IPT, and felt competent to provide this intervention (both facilitators in the professional domain), but not every team was trained in IPT (a barrier in the organisation). The lack of professionals in the teams who could provide the recommended treatments was the reason why patients did not receive the recommended intervention (a barrier in the organisation).

Indicator 5: monitor treatment response and reallocate treatment if necessary

Overall, the treatment response was monitored within the recommended time frame in 32 % ($N = 53$) of cases when a treatment was initiated ($N = 166$) (see Table 3 for the indicators on monitoring). This percentage differed between treatment groups. In patients who received a first-step treatment ($N = 28$), the treatment response was monitored in 46 % of cases ($N = 13$) after 4–8 weeks (25–51 %); when psychotherapy and/or antidepressants were initiated ($N = 133$), the treatment response was monitored in 30 % of cases ($N = 40$) within 10–14 weeks (0–60 %). The CDI was used in half of the cases where the response was monitored. Of the 53 times that the treatment response was monitored, the response of 26 patients appeared insufficient. In 18 patients (69 %), one step up to a more intensive treatment was made, as recommended.

Some teams monitored the response more often and more carefully, and found the registration forms that were developed for the implementation project stimulating and helpful. Some teams found it hard to monitor the response within the recommended time frame (see Table 3 for the different time frames). Some teams did monitor, but due to time pressure they did not register the monitoring. When monitoring took place, it often took place (much) later than recommended (organisational barriers). In general, it seemed to be a planning problem (an organisational barrier). Installing a reminder in the calendar of the professional and linking the monitoring to a team meeting where the treatment effects were discussed, were considered helpful (both facilitators in the organisation). Teams found it difficult to reallocate treatment (a barrier in the guideline). Reallocation of treatment when treatment response is insufficient depends on the monitoring of the treatment response in patients. Only if this last recommendation is implemented can the intervention be adjusted in accordance with stepped care principles.

Nationwide implementation recommendations

Based on the factors that were associated with the uptake of the guideline recommendations, nationwide recommendations were formulated regarding the individual professionals, teams, and organisations. For professionals, teams recommended that each professional should carry responsibility for the uptake of guideline recommendations. On the team level, teams asserted that a quality improvement project helps in the following ways: to systematically implement the guideline recommendations; to make an analysis of the actual and the optimal depression care, and prioritise which recommendations to implement first; to decide on the tasks and responsibilities of the team members; to make all team members responsible for the uptake of the guideline recommendations; to evaluate progress by discussing the results, and plan new actions to improve depression care; and to discuss care for individual patients in the light of the guideline recommendations. For organisations, teams recommended that the board, management and team support the quality improvement project in the following ways: to focus on quality improvement; to develop care pathways for the guideline recommendations; to provide the guideline as well as the instruments and interventions recommended in it; to provide training to the professionals in the recommended instruments and interventions; to inform patients and their parents that care is delivered according to the depression guideline; to monitor patients' progress; and to instal electronic tools and reminder records to enhance the uptake of guideline recommendations.

Discussion

Main findings

This study involved a quantitative and qualitative evaluation of the implementation of key guideline recommendations in depression care for children and adolescents. The results show that most, albeit not all, patients referred to the mental healthcare organisation were screened for depression. In more than one-third of the patients of the teams, a diagnostic instrument was used to diagnose the depression. The severity of the depression was assessed in most patients. Less than half of the patients received an intervention that was recommended for the patient's depression severity. Patients with moderate depression most often received the recommended intervention. In patients with severe depression, most received CBT or antidepressants, instead of a combination of CBT and antidepressants, while

mildly depressed patients often received interventions that were too intensive. Of the patients that received antidepressants, a quarter received weekly checks for suicidal thoughts in the first 6 weeks. Monitoring of the treatment response with questionnaires took place in one-third of the patients within the recommended time frame, and when the treatment response appeared insufficient, the treatment was adjusted in two-thirds of patients. There was much variation across teams in some outcomes (screening, diagnosis and treatment evaluation), but less in other outcomes (providing stepped care treatment). Factors associated with the uptake of the guideline recommendations were mostly related to the organisation (available professionals that could provide certain treatments, available time, electronic tools and reminders) or the professional (skills, attitude), and not so much to the guideline itself or to the patients.

Our study shows that the recommended stepped care principles for the allocation of depression interventions were not always applied. One would expect the guidelines to be followed in the majority of cases, especially after an implementation project. However, this does not mean that patients received an intervention which was not appropriate; they received a different intervention than the recommended one, which may have been appropriate for these specific patients. The recommended guidelines clearly indicate that deviation from guideline recommendations is possible in individual cases, but this should be well documented and supported with arguments.

Strengths and limitations

There is a lack of knowledge with regard to the implementation of depression guidelines in children and adolescents. This study is one of the few in this field that investigates the uptake of guideline recommendations after an implementation project. A strength of this study was the use of different research methods to evaluate the implementation. A quantitative approach was applied to determine the uptake of guideline recommendations. To identify factors that influenced the uptake of guideline recommendations, a qualitative approach was applied, which provided a deeper understanding of the factors affecting the implementation. To optimise the implementation process, QIC interventions were supplemented with tailored interventions to overcome the barriers identified by the teams. Another strength was that the study included a relatively large number of patients. There were also limitations. First, since the participating teams were motivated to implement guideline recommendations, the results may be less generalisable to other specialised mental healthcare teams. It is unlikely that poorly motivated teams had volunteered to participate. Second, we focused on a limited number of barriers, which may not have covered all barriers that influence the uptake of guideline recommendations. For example, financial structures can be a hindering factor, but have limited opportunities for modification in a clinical study. Third, the study did not include a comparison group of teams that did not participate in the implementation project, and no data on the degree of implementation were collected before the start of the implementation project. Therefore, it is unclear whether the implementation project was responsible for the degree of implementation, and whether the teams improved over time. However, in the interviews, the teams said that the implementation project did enhance the implementation of the guideline, so it is likely that improvement did occur. Fourth and finally, the effect of the implementation project on patient outcomes was not monitored. This can be an issue for guideline recommendations with weak or conflicting research evidence. However, the study focused on professional performance, which is a first and essential prerequisite for achieving improved patient outcomes.

Comparison with existing literature

To our knowledge, this is one of the few studies that investigated the implementation of a depression guideline in children and adolescents. Comparable to the findings of our study, a study in the US found that quality improvement projects and the monitoring of the effects of these projects were helpful in the implementation process [33]. Training and supervision in evidence-based treatments seem to be an important precondition to delivering high-quality care [21]. The same study found that the recommendations on prescribing antidepressants in adolescents with severe depression were hampered by professional barriers. The recommendation on antidepressants was perceived as controversial by professionals, as the scientific evidence underlying these recommendations was weak. Our study suggests that the guideline recommendations in combination with the implementation project reassured professionals that antidepressants have a place in stepped care treatment allocation. The main barrier in providing interventions was the lack of available, trained professionals in the teams who could provide the recommended treatments. Other studies in the Netherlands reported the same finding. One study found that the provision of the recommended first-step treatment in borderline personality disorder in adults was hampered by a lack of available, specialised psychotherapists [34]. Moreover, a review of the results of breakthrough projects in the Netherlands, concerning the guidelines for schizophrenia, anxiety disorders, and depression in adults, reports that the main barrier for teams to provide psychotherapy appeared to be the insufficient capacity of psychotherapists [35]. Other organisational barriers were also mentioned in this review (lack of cooperation, too little time available, lack of support), as were barriers at the professional level (insufficient

knowledge and skills). However, breakthrough projects had a positive impact on the implementation of guidelines [35]. Care processes improved unmistakably, and evidence-based interventions are used more and to better effect after such projects, compared to their use before. Nevertheless, a significant proportion of patients did not receive the recommended treatment, received it too late, or did not receive it in an optimal manner.

Implications for research and clinical practice

According to the participating teams, the implementation project helped to implement the key recommendations of the multidisciplinary depression guideline for children and adolescents. However, it is unclear which interventions of the implementation project in our study actually affected the implementation process. Examining the effectiveness of specific implementation interventions should be a focus of future research.

To enhance implementation, the experiences of implementing guideline recommendations in clinical practice should be taken into account when guidelines are updated. Recommendations that are difficult to implement should be afforded specialised attention, e.g. by making transparent how strong or weak these recommendations are (in the latter case, there is more room to deviate from the recommendation), and by giving advice on how to overcome barriers.

Conclusion

The teams were positive about the targeted and systematic effort to implement guideline recommendations for children and adolescents with depression. They felt that the implementation programme helped to improve the care they delivered. Our results show that the guideline recommendations found their way into practice. However, not all recommendations were implemented equally well. The use of a diagnostic instrument or interview, the monitoring of adverse effects of antidepressants and the monitoring of the treatment response seemed comparatively poorly implemented. Also, patients with severe depression rarely received the recommended combination of CBT and antidepressant medication, whereas many mildly depressed patients received interventions that were too intensive. Implementation efforts should focus on removing the main barriers for the uptake of these guideline recommendations. On the other hand, screening patients with a screening instrument and the assessment of depression severity during the diagnostic process seemed well implemented. Moreover, patients with moderate depression (the majority of patients) received the recommended interventions of IPT or CBT. Thus, although there remains room for further improvement, our study indicates that the implementation programme has helped to improve the uptake of some of the guideline recommendations.

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Conflict of interest The authors declare that they have no conflict of interest.

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