






Barriers and facilitators to implementation of cognitive adaptation training in long-term inpatient facilities for people diagnosed with severe mental illness: A nursing perspective

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Accessible Summary

What is known on the subject?

- To date, the majority of the research regarding innovative psychosocial interventions in psychiatry focuses upon the development and effectiveness of the interventions. Despite the fact that these are important clinical and scientific contributions, only a small percentage of the evidence-based interventions reach clinical practice.
- Cognitive Adaptation Training (CAT) is an effective psychosocial intervention to increase daily functioning and cognitive functioning in people diagnosed with severe mental illness (SMI) in inpatient and outpatient psychiatric care.
- Despite knowledge on the intervention's effectiveness, systematic use of CAT in the daily routine of mental health nurses is insufficient.

What the paper adds to existing knowledge?

- To date, no research is available that describes the factors associated to the implementation of CAT from a nursing perspective.
- This research also adds to the literature on rehabilitation in people diagnosed with SMI in an inpatient setting.
- The results contribute to the science of implementing interventions in long-term psychiatric care and may help future interventions in their implementation process.

What are the implications for practice?

- This study highlights that multiple factors need to be considered when implementing an intervention in routine care and that it is a complicated process.
- Future implementation initiatives require ongoing training and supervision of CAT specialists, appointment of local champions to increase commitment among nursing staff and inclusion and commitment of management to overcome organizational barriers.

This study is registered at the Netherlands Trial Register (identifier: NTR3308). Date registered: 12 February 2012.

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© 2022 The Authors. *Journal of Psychiatric and Mental Health Nursing* published by John Wiley & Sons Ltd.

Funding information

Fonds NutsOhra, Grant/Award Number: M13.143271

- Without acknowledging the presence of barriers to implementation and considering strategies to overcome these barriers, sustainable implementation is likely to be unsuccessful.

Abstract

Introduction: Evidence-based interventions in psychiatry often fail to reach clinical practice. Cognitive Adaptation Training (CAT) is an evidence-based psychosocial intervention that aims to improve daily functioning of people diagnosed with a severe mental illness. Implementation of CAT remains challenging, despite demonstrated effectiveness.

Aim: Identifying facilitators and barriers of CAT on the intervention, nursing, and organizational levels, and investigating relationships between capability, opportunity, motivation, and appraisal using the COM-B model.

Method: The Measurement Instrument for Determinants of Innovations and CAT-specific questions were administered to 46 nurses. The relationship among capability, opportunity, motivation and appraisal was calculated using the Pearson's *r* correlation coefficient.

Results: Nine barriers (mostly organizational level) and 13 facilitators (mostly intervention and nursing level) were identified. Significant moderate correlations were found between capability and opportunity, capability and motivation, capability and appraisal and a strong correlation between motivation and appraisal.

Discussion: The results suggest that barriers at the organizational level should be removed and facilitators at intervention and nursing levels may be exploited to improve implementation.

Implications for practice: Future implementation initiatives require ongoing training and supervision of CAT specialists, appointment of local champions to increase commitment among nursing staff and inclusion and commitment of management to overcome organizational barriers.

KEYWORDS

evidence-based practice, recovery, rehabilitation, schizophrenia, service evaluation

1 | INTRODUCTION

Service users diagnosed with a severe mental illness (SMI) cope with severe and persistent symptoms in positive, negative and cognitive domains that substantially impact their daily functioning (Green et al., 2000; Killaspy et al., 2008). They often need long-term inpatient psychiatric care that provides essential daily support in various life domains to enhance functioning. However, the rehabilitation interventions described in the literature mainly focus on areas of functioning that are not (yet) relevant for most people receiving treatment in long-term inpatient settings, e.g. education (Leonard & Bruer, 2007) and employment (Bond et al., 2020).

Cognitive Adaptation Training (CAT) is a psychosocial intervention that addresses basic life skills, such as personal hygiene, and may be appropriate for treatment provided in inpatient settings. CAT aims to increase functional skills by compensating for cognitive impairments, rather than training cognition (Allott et al., 2020; Velligan et al., 2002). Following an assessment of functional skills, cognitive

functioning and overt behaviour, compensational strategies are developed, and environmental aids are proposed. Research has revealed consistent positive effects from CAT on daily functioning, relapse prevention and quality of life in outpatient services (Velligan et al., 2002, 2008). Furthermore, people diagnosed with severe and persistent mental illness who need long-term inpatient care show improvements in daily life skills, executive functioning and visual attention (Quee et al., 2014; Stiekema et al., 2020). Thus, it may be a valuable addition to the treatment provided in these settings.

However, despite interventions' effectiveness, it has been established that translation of research findings to clinical practice is lacking (Drake & Essock, 2009). Determining barriers to and facilitators of such interventions' implementation may provide valuable insights, both for intervention-specific aspects, as well as evidence-based practice in general. Barriers and facilitators can be identified at different levels of care delivery: intervention level (e.g. "Is the intervention clearly described?"); provider level (e.g. "Do the providers have sufficient knowledge and skills?") and organizational



level (e.g. "Is there enough time available to use the intervention?"). Knowledge of these factors is essential for implementation, as it provides important input for the design of effective strategies to translate the research findings to clinical practice. Moreover, barriers and facilitators within these levels may interact with and strengthen each other. This is outlined by the capability (C), opportunity (O), motivation (M) and behaviour (B) (COM-B) model, which considers behavioural change in individuals as the mechanism that drives implementation (Michie et al., 2011). The model assumes that relationships among capability, opportunity and motivation are related causally to behavioural change (B) and vice versa. As such, these factors and their relationships provide explanations for why a nursing staff is or is not engaging in a desired behaviour, which is the use of CAT in the present study. *Capability* is defined as the psychological and physical ability to perform CAT (e.g. knowledge), *opportunity* is defined as the social and physical circumstances that lie beyond nurses' control, but are necessary for performing CAT (e.g. social support and resources) and *motivation* is defined as the reflective (e.g. belief that CAT is effective) and automatic (e.g. CAT is part of routine care) processes that direct nurses' behaviour.

In the current study, we aim to gain a better understanding of the factors associated with implementation of CAT in facilities that provide inpatient care to people diagnosed with SMI. First, we aim to identify barriers to and facilitators of CAT at the intervention, provider, and organizational levels. Second, we aim to investigate the relationships described in the COM-B model. This study's results allow us to comprehend crucial factors that need to be considered when implementing CAT and other psychosocial interventions in clinical practices, and they may provide a groundwork for future implementation research.

2 | METHODS

2.1 | Trial design

This study is part of a large multicentre randomized controlled (RCT) trial to evaluate the effectiveness of Cognitive Adaptation Training (CAT) as a nursing intervention in long-term inpatient mental health-care (Stiekema et al., 2020). As part of this trial, a post hoc process evaluation was conducted in which all nurses in the departments allocated to the CAT condition were approached for participation. All nurses provided oral informed consent.

2.2 | Intervention

CAT is a psychosocial intervention that aims to improve everyday functioning by compensating for cognitive impairments through the use of compensational strategies and environmental aids (Velligan et al., 2000) that are based on service users' personal goals, as well as their executive functioning level and the manifestation of these executive impairments in daily life (behavioural type). Additional information on CAT is described in the CAT manual (Velligan et al.,

2010). In this randomized controlled trial, 12 nursing teams were randomized and divided equally into those working with CAT while administering treatment as usual (TAU) and those using TAU only. The nurses in the CAT group received one day of didactical training on how to set up CAT interventions in line with the CAT protocol. These nurses were responsible for setting up and adjusting CAT interventions for one to three service users, and the whole team was responsible for the support and continuation of the interventions on a daily basis. All CAT-related work activities (organization, adjustments and the use of compensational strategies and environmental aids) were performed during regular contact moments between service users and nurses; so, no extra time or personnel was used to perform these tasks. Two psychologists from the department supervised the study. The results from the RCT were not yet available at the time the process evaluation was administered. Therefore, the nurses were not aware of the results of the RCT.

2.3 | Outcomes

The Measurement Instrument for Determinants of Innovations (MIDI) was used in this study, which is designed to determine barriers to and facilitators of intervention implementation (Fleuren et al., 2014). Two trained assistants (MA level) administered the MIDI as a semi-structured interview. The MIDI was developed based on a literature review followed by a Delphi study among implementation experts, thereby ensuring content validity (Fleuren et al., 2004). The MIDI comprises 29 determinants measured on Likert scales that represent the degree of agreement or disagreement with items. Choice options ranged from 1–2 (no/yes) and 1–6 (none to all). The MIDI contains four subscales: intervention-specific (e.g. "The intervention is based on factually correct knowledge"; seven items); intervention-adoption (e.g. "I (i.e. the nurse) feel that it is my responsibility to use CAT"; 11 items); organization-specific (e.g. "There is sufficient staff to use the intervention"; 10 items) and socio-political context (e.g. "The activities listed in the intervention fit in well with existing legislation and regulations"; one item). The latter was not used in the current trial because CAT is in compliance with national legislation and regulations. For several items (items 8, 13, 15 and 16), subquestions were formulated. These adjustments to the MIDI were in line with the MIDI instruction guide that states determinants can be omitted or tailored to the study's aims. The overall internal consistency of MIDI was acceptable ($\alpha = 0.74$) (George & Mallery, 2003).

In addition to the MIDI, we created six items specifically related to CAT: attending CAT training; declarative and procedural CAT-related knowledge; motivation to use CAT; knowledge of service users' behavioural type and executive functioning level and ability to set up CAT interventions. Choice options ranged from 1–2 (no/yes) and 1–6 (none to all). All MIDI determinants and CAT-specific items are described in Table S1.

Both the MIDI and CAT-specific questions were administered as a semi-structured interview. To provide in-depth qualitative

data in addition to the quantitative data derived from the MIDI and CAT-specific questions, all nurses were asked to elaborate on their answers.

2.4 | Statistical methods

Considering that higher scores represent greater agreement, several items needed reverse scoring. Means and standard deviations (SDs) were calculated for each determinant. To determine whether items were barriers, facilitators or neither, two answer categories were used for the four-point Likert scale (disagreement, agreement) and three categories for the Likert scales with five to seven items (disagreement, neutral and agreement). A determinant was viewed as a barrier if $\geq 20\%$ of the respondents disagreed and a facilitator if $\geq 80\%$ of the respondents agreed with the determinant (Deenik et al., 2019; Verberne et al., 2018).

The relationships among capability, opportunity and motivation in the COM-B model were analysed as follows: All questionnaire items were allocated to capability, opportunity or motivation based on consensus ratings (authors MD, LM and MP). This process revealed five items that did not correspond with either of these categories and were categorized as a fourth construct: appraisal (A). In this study, *appraisal* is defined as the provider's evaluation of CAT and its perceived value for clinical practice. Next, a mean score for each nurse was calculated based on the constructs' capability, opportunity, motivation and appraisal by adding original data from the nurses on the MIDI and CAT-specific items, then dividing by the number of items in that category. Item categorization is presented in Table S2. Pearson's *r* correlation coefficient was used to assess the relationship among capability (C), opportunity (O), motivation (M) and appraisal (A) ($\alpha = 0.05$). The assumptions for Pearson's *r* were met. Considering that we did not include a measure to determine behavioural change (B), we were unable to include this construct in our analysis. All analyses were conducted using IBM SPSS Version 26.0 (IBM Corp., 2019).

Thematic analysis was used to categorize the qualitative data and was performed by MvD. In line with Noticing-Collecting-Thinking method described by Friese (2019), an inductive approach was used to determine the corresponding topics mentioned among nurses. The nurses' answers that included similar topics to the questions were quantified in percentages.

3 | RESULTS

3.1 | Recruitment

All nurses in the CAT condition ($n = 50$) were approached and invited to participate between March and June 2016. Altogether, 46 of the 50 eligible nurses agreed to participate in the interviews (eight males, 38 females). Four nurses could not be included because they were no longer employed on the participating teams at the time the interviews were administered. The MIDI results are presented in Table 1.

3.2 | Outcomes

3.2.1 | Barriers and facilitators

Intervention level

Regarding the intervention CAT, 80% of the nurses identified procedural clarity as a facilitator, stating that the intervention helps them work in a structured and systematic manner. No barriers relating to this level were identified.

Provider level

Regarding the provider level, 83% of the nurses identified motivation to use CAT in daily practice as a facilitator, and the 17% who did not provided various explanations: "CAT seems a lot like the things we already do in our daily work" and "I was not motivated because of the way it was brought to me. I was just told to do it." Altogether, 89% identified outcome expectation as a facilitator, indicating that they expected CAT to contribute to service users' independence: "CAT helps me to understand why certain tasks are difficult for service users, so I can take this into account while supporting him or her. It also helps break up larger goals into smaller steps." Altogether, 83% identified professional obligation as a facilitator: "It is my job to help the service users move forward, and CAT supports this process." Social support from co-workers (83%) and supervisors (84%) also was identified as a facilitator, indicating that the nurses expected to receive sufficient support from their co-workers and managers: "I would receive help and support from every team member if I would need it. My manager is also a strong supporter of CAT." Finally, self-efficacy to create (91%) and perform (96%) CAT interventions, and subjective awareness of CAT content (89%) were identified as facilitators.

Altogether, 26% of the nurses cited personal disadvantages as an important barrier, including: (i) administrative burdens associated with RCT outcome measures eliciting negative attitudes towards CAT by association; (ii) concerns that the intervention is too much of a burden for service users and (iii) the risk of intervention discontinuity in their absence due to non-engagement with co-workers. As a second barrier, nurses in the teams that were assigned to the CAT condition reported that almost half their colleagues have not adopted CAT (item "descriptive norm" in the MIDI) in their day-to-day work (40%): "I talk about CAT with my colleagues, but I don't really see them applying it." A lack of declarative and procedural CAT knowledge was identified as a third barrier, with 54% of the nurses unable to name more than one aspect related to CAT. The aspects that were mentioned mostly were the use of environmental aids ($n = 9$) and the goal of improving daily functioning ($n = 7$). Compensating for cognitive deficits was reported rarely ($n = 2$), as was the use of behavioural type in developing CAT interventions ($n = 2$). Furthermore, most could not indicate service users' executive functioning level (76%) and behavioural type (62%). Also, 28% of the nurses did not attend a basic CAT training session, but instead learned from a colleague or read the instruction manual.

TABLE 1 Means, standard deviations and percentages of determinants

Determinants	M	SD	N	% disagree	% neutral	% agree
Determinants associated with CAT						
1. Procedural clarity	3.8	0.7	46	6.5	13.0	80.4
2. Correctness	3.7	0.6	46	4.3	23.9	71.7
3. Completeness	3.7	0.7	46	4.3	30.4	65.2
4. Complexity	3.8	0.9	46	10.9	13.0	76.1
5. Compatibility	3.8	0.6	46	4.3	17.4	78.3
6. Observability	3.5	0.9	46	4.3	17.4	78.3
7. Relevance for service users	3.6	0.8	46	10.9	23.9	65.2
Determinants associated with the user (nurses)						
8a. Personal benefits	3.6	0.7	45	8.9	17.8	73.3
8b. Personal drawbacks	3.3	1.1	45	26.7	26.7	46.7
9. Outcome expectations	4.1	0.6	46	-	10.9	89.1
10. Professional obligation	3.9	0.7	46	4.3	13.0	82.6
11. Service users' satisfaction	3.6	0.5	46	2.2	39.1	58.7
12. Service users' cooperation	3.6	0.6	36	2.8	33.3	63.9
13a. Social support: co-workers	3.9	0.8	46	8.7	8.7	82.6
13b. Social support: supervisors	4.0	0.7	45	4.4	11.1	84.4
14. Descriptive norm (1-7)	4.6	1.7	43	39.5	18.6	41.9
15a. Subjective norm: supervisor	3.8	0.9	46	6.5	21.7	71.7
15b. Subjective norm: management	4.0	1.0	46	6.5	15.2	78.3
15c. Subjective norm: opinion supervisor	3.3	0.9	46	15.2	34.8	50.0
15d. Subjective norm: opinion management	3.5	0.9	46	10.9	26.1	63.0
16a. Self-efficacy: create CAT interventions	4.0	0.6	46	2.2	6.5	91.3
16b. Self-efficacy: perform CAT interventions	4.0	0.6	46	2.2	2.2	95.7
17. Knowledge	3.6	1.0	46	15.2	21.7	63.0
18. Awareness of content of CAT (1-4)	3.1	0.6	46	10.9	-	89.1
Determinants associated with the organization						
19. Formal ratification by management (no/yes)	1.7	0.4	42	26.2	-	73.8
20. Replacement when staff leave	3.4	1.0	46	19.6	26.1	54.3
21. Staff capacity	3.8	0.8	46	13.0	6.5	80.4
22. Financial resources	3.5	.8	46	10.9	30.4	58.7
23. Time available	3.4	0.9	46	19.6	28.3	52.2
24. Material resources and facilities	3.8	0.7	46	8.7	13.0	78.3
25. Coordinator (no/yes)	1.9	0.3	44	9.1	-	90.1
26. Unsettled organization (no/yes)	1.1	0.3	46	87.0	-	13.0
27. Information accessible about use of CAT	4.0	0.6	46	2.2	8.7	89.1
28. Performance feedback	3.1	1.0	46	37.0	21.7	41.3
CAT-specific items						
29. CAT knowledge	1.5	1.3	46	54.3	32.6	13.0
30. Attendance training (no/yes)	1.7	0.5	46	28.3	-	71.7
31. Behaviour type (no/yes)	1.4	0.5	37	62.2	-	37.8
32. Level of executive functioning (no/yes)	1.2	0.4	31	75.7	-	24.3
33. Implementation of CAT interventions (no/yes)	1.8	0.4	38	18.4	-	81.6
34. Motivation to use CAT (1-4)	3.2	0.8	46	17.4	-	82.6

Note: All response options range from 1 to 5, except if otherwise stated between parentheses. Disagree = score < 3; neutral = score 3; agree = score > 3. Barriers ($\geq 20\%$ disagree) and facilitators ($\geq 80\%$ agree) are depicted in bold.

TABLE 2 Correlation matrix

	N	Capability	Opportunity	Motivation	Appraisal
Capability	46	-			
Opportunity	39	0.325*	-		
Motivation	45	0.469**	0.184	-	
Appraisal	46	0.430**	0.214	0.738**	-

* $p \leq .05$.** $p \leq .001$.

Organizational level

Several facilitators were identified regarding the organizational context. Altogether, 80% of the nurses indicated that they had sufficient staff on their teams to use CAT as intended. Also, 87% stated that a formal coordinator had been assigned to manage the implementation of CAT. Finally, 89% indicated that information about CAT was easily accessible within their organization.

Altogether, 26% identified lack of a formal document (e.g. work plans and policy plans) that described the use of CAT within the organization ("formal ratification" in MIDI) as a barrier. Furthermore, 87% identified an unstable organization due to organizational changes as a barrier. Most stated experiencing changes in treatment policy: "We need to support people in doing their own grocery shopping, rather than providing these for them." Others mentioned changes in organizational structure, e.g. a shift from a manager-led team to a self-managing team, as the most disturbing. Finally, 37% identified a lack of performance feedback as a barrier, with more than one-third citing insufficient feedback from the organization regarding CAT progress and implementation: "In the beginning, CAT interventions were regularly discussed in the multidisciplinary team meetings, but later on, I never heard anything about it anymore."

3.2.2 | Capability, opportunity, motivation and appraisal

As shown in Table 2, bivariate correlational analysis revealed significant moderate positive correlations between capability and opportunity, capability and motivation, capability and appraisal as well as a strong correlation between motivation and appraisal.

4 | DISCUSSION

This study aimed to identify the barriers to and facilitators of implementation of evidence-based practice, such as CAT in routine practice, as well as examine the relationships among capability, opportunity, motivation and appraisal based on the COM-B model. Most importantly, we found that most barriers were identified at the organizational level, and most facilitators were cited at the intervention and provider levels. Furthermore, our results confirm the relationship among the factors identified in the COM-B model in the CAT context.

4.1 | Interpretation

4.1.1 | Barriers and facilitators

Intervention level

We did not identify barriers at the intervention level. Procedural clarity was identified as a facilitator, indicating that the steps necessary to set up a CAT treatment plan were understandable to the nursing teams. Other studies found that an intervention perceived complexity is correlated inversely with implementation success (Damschroder et al., 2009; Greenhalgh et al., 2004; Gustafson et al., 2003). Thus, the clear and understandable CAT procedure confirms feelings of competence and, thus, will boost willingness to use CAT. However, objective measures of procedural CAT knowledge found the opposite among the interviewed nurses, as described in the section below.

Provider level

Personal disadvantages were identified as a barrier and mostly were related to the administrative burden caused by the research outcome measure, inducing negative appraisals and associations towards the intervention being implemented. This burden may weaken motivation to engage in research activities in general (Clark, 2008), but this barrier might not apply when implementing CAT in clinical practices, as there are no extra administrative tasks to perform related to research. This is in line with the nurses who indicated being highly motivated to work with CAT, as this process evaluation was administered post hoc, when research administrative tasks were no longer required.

Although most of the nurses cited being able to design, set up and implement CAT interventions; felt motivated to use CAT; perceived CAT as part of their job and cited support from both their manager and co-workers, they also indicated that less than half of their co-workers used CAT in their daily practice. Despite our efforts to minimize socially desirable answers by employing students unfamiliar to the nurses, this may explain the discrepancy in reporting on having sufficient knowledge and the relatively low level of actual declarative and procedural knowledge. The latter would be viewed as a barrier, as inadequate practical and theoretical knowledge of CAT's working mechanisms may affect treatment fidelity.

Organizational level

The determinant of formal ratification was identified as a barrier, indicating the absence of a formal document (e.g. work plans and



policy plans) that describes CAT use within the organization. The absence of such a document might induce the feeling that the organization, including management, is not fully committed to CAT use in practice. This is important, as leadership commitment to implementing an intervention into routine care significantly impacts implementation success (Damschroder et al., 2009). Nevertheless, the lack of formal ratification did not seem to affect nurses' feelings of management support and instead viewed it as a facilitator. This is in line with a study on the implementation of Assertive Community Treatment (ACT) in people diagnosed with SMI, demonstrating that both middle/upper management and team leadership were decisive determinants of implementation success (Mancini et al., 2009).

Furthermore, an unstable organization was identified as a second barrier. The qualitative reports indicated that instability was perceived mostly in relation to changes in treatment policy, aiming at more recovery-oriented care and a transition towards deinstitutionalization. In line with the recovery movement, the departments were required to transform from residential to treatment facilities (Medeiros et al., 2008). This instability perception did not seem to impact motivation to use CAT in daily practice. Nursing staff possibly were able to align CAT with this recovery-oriented care perspective, but this was not stated explicitly among any of the nurses.

A third barrier was the lack of regular feedback meetings to discuss CAT progress. Although providing feedback was incorporated into the study design by providing individual supervision at least once a month during the first two months and CAT group meetings during the subsequent six months (Stiekema et al., 2015), more feedback was desired. Other research also outlined supervision's importance in implementation. Weekly supervision and progress reports that present support for the intervention were among the strongest predictors of successful implementation (Fixsen et al., 2005; Greenhalgh et al., 2004; Whitley et al., 2009).

Although factors at the provider level, such as thorough training, are essential for implementation, contextual factors, such as organizational characteristics, need to be considered. As these factors generally are more easily changeable in contrast to provider-level factors, management can play an important role in this process. Engagement and active interest may empower staff, as they feel valued by their organization, which is related to better implementation outcomes. This accounts for both direct engagement, e.g. feedback meetings, as well as indirect engagement, e.g. describing use of the intervention in a formal document. Therefore, even though treatment staff mostly provide evidence-based practices to service users, management needs to be involved to increase implementation success.

4.1.2 | COM-B

Consistent with the COM-B model, we found a positive relationship between nurses' capability and motivation to use CAT in everyday practice. This study evaluated capability mostly through self-evaluation, rather than objective measurements, which would

justify interpreting capability as self-efficacy, i.e. a person's beliefs regarding their capability to perform a specific behaviour or skill (Bandura, 1977; Treasure, 2004)—in this case, capabilities tied to applying CAT. The positive relationship between capability and motivation found in this study suggests that self-efficacy may induce increased motivation to apply CAT and vice versa. This is in accordance with research demonstrating that people with strong feelings of self-efficacy are more inclined towards adopting the intervention and continuing use when encountering implementation difficulties. The positive correlation between motivation and appraisal supports this interpretation and suggests that a positive evaluation of CAT and its perceived clinical value increase motivation to use it. This triangle comprising self-efficacy, appraisal, and motivation to change behaviour is emphasized in the literature on motivational interviewing in psychiatric treatment, which states that the relative importance (appraisal) of change and self-efficacy drive an individual's readiness to change behaviour (Treasure, 2004).

Considering the importance of self-efficacy and appraisal of change for motivation, these findings emphasize the need for adequate training and active learning to increase adoption of evidence-based practice. However, current data suggest that formal CAT knowledge on procedures and related CAT concepts seems limited. Thus, more thorough in-depth training and possibly other training approaches need to be considered in addition to ongoing supervision and feedback. Other research has found that training through workshops and manuals was insufficient to create adequate treatment fidelity, skills and competence (Beidas & Kendall, 2010; Sanders & Turner, 2005). Active learning processes—including coaching, on the spot learning, and feedback to evaluate progress—were found to be the most effective in increasing implementation and should be incorporated in future studies to increase formal knowledge of an intervention, thereby enhancing feelings of self-efficacy.

Although not specified in the COM-B model, a positive relationship also was found between the capability and opportunity to use CAT in everyday practice, indicating that the more the nurses feel supported, the more capable they feel in using CAT. The capability approach emphasizes this relationship (Sen, 1974) and states that people's abilities generally are determined by external factors, such as interactions with others, education and access to resources. Similarly, the implementation literature demonstrates that managers' commitment and involvement are important to implementation success, considering that they can allocate resources (e.g. training budgets, space, and time) and help prioritize work tasks necessary for effective implementation (Rycroft-Malone et al., 2004). Finally, sufficient capabilities to apply CAT may result in better intervention effectiveness and consequently strengthen contextual factors in implementing CAT. If the intervention beneficial outcomes are more visible to managers and co-workers, they are likely to be more willing to invest in terms of social support and allocation of resources necessary to implement the intervention.

Contrary to findings described in the literature (Michie et al., 2011), we did not find a relationship between motivation and opportunity. Although we cannot explain this in relation to other research findings,

the motivation to use CAT possibly is associated with other contextual and organizational factors that we did not measure in this study.

4.2 | Implications for nurses

To advance the use of evidence-based practices in clinical care provided by nurses, several steps are advised. Based on our study, the major priority for future use of CAT in clinical care should be on training the whole nursing team that will utilize CAT to ensure they have adequate knowledge of the intervention. Based on the data that measured formal knowledge of CAT, this study indicates that the one-day training and clinical supervision on performing CAT were insufficient for the nurses to be able to understand all concepts and underlying neuropsychological processes that are the basis of the intervention. As a consequence, treatment fidelity might be affected, which may have influenced the intervention's effectiveness. Our study also demonstrates that the degree to which someone feels capable enough to use the intervention affects their motivation to use it, as does the degree to which they feel that the intervention is useful in their day-to-day care. Therefore, more emphasis should be placed on initial and ongoing training of the nursing team as a whole, as well as local champions—i.e. people who initiate, carry out and support the intervention within their team (e.g. by demonstrating the evidence-based practice's benefits, helping co-workers gain knowledge and attending discussions with co-workers), thereby providing an exemplary role and imbuing the intervention with a sense of ownership—particularly in terms of supervision or booster sessions. A second gateway to better implementation is to focus on highly motivated people. Appointing local champions could foster implementation and contribute to other nurses' decisions to adopt the evidence-based practice (Aarons et al., 2012; Fishbein et al., 2003), and as a result, may convince others to use it. Despite these local champions' beneficial role, when they leave, implementation of the intervention may stagnate. To minimize this risk, either multiple local champions should be appointed or a new local champion should be sought. The final implication for clinical practice is to involve management in the implementation process to determine collaboratively the barriers that hinder its successful use in daily care. This includes issues such as how to engage the nursing staff; create commitment to and ownership of the intervention; determine which additional training or supervision is needed and allocate resources such as time and associated costs. If these improvements can be achieved, it will create a more collective approach to implementing evidence-based practice within the nursing teams, thereby creating a better fundament for sustainable implementation.

4.3 | Strengths and limitations

An important strength of this study is that it has been conducted in a setting in which treatment options were scarce and received little attention in research over the past few decades. Furthermore,

our results provide important suggestions for future effectiveness and implementation research in this population. Mapping these barriers to and facilitators of implementation will help establish more tailored implementation strategies to overcome implementation barriers. Therefore, this study's results have been incorporated into follow-up research on the implementation of CAT in routine care (van Dam et al., 2020).

This study also has some limitations. First, we could not relate current findings to implementation success, such as treatment fidelity, due to a lack of data. Similarly, we had no measure with which to gauge behavioural change, thereby preventing us from analysing all components of the COM-B model. Second, the MIDI was administered as a semi-structured interview (instead of a questionnaire), on the advice of the developers, which may have yielded socially desirable responses. Nevertheless, we gathered more in-depth data from 46 of the 50 nurses (92%)—a very high response rate compared with usual response rates of 20%–47% for online or paper surveys (Nulty, 2008). Furthermore, despite the thorough development process, which suggests solid content validity, the MIDI has not been validated fully yet. Also, considering that the MIDI was designed for preventive child healthcare and is presented as applicable for other settings as well, the determinants may not overlap completely with those in mental healthcare. Third, we set cut-offs for barriers ($\geq 20\%$) and facilitators ($\geq 80\%$) in line with other studies that have used the MIDI (Deenik et al., 2019; Dugstad et al., 2020). Although several items did not qualify as barriers or facilitators under these standards, they still can impact implementation significantly (Greenhalgh et al., 2004). For example, 19.6% indicated that they lacked time to use CAT and that no trained replacements were available when nurses leave. If this is not addressed and no educated replacement is available when staff changes occur, implementation most likely will fail. Fourth, considering that service users were the primary focus of the original research (the RCT), we did not gather any additional descriptive data on the nursing staff, other than gender. Also, the fact that this research was administered post hoc might have biased the results. Although the nursing teams were not aware of the results from the RCT (considering that these were not analysed yet), they might have observed an increase in daily functioning among service users who used CAT. This could have resulted in more positive results than if it was administered during the study period. Finally, this study provides several recommendations to improve overall implementation of CAT in routine practice. The paper introduces these recommendations, but they are described in more detail in the study protocol for a follow-up study on a new implementation programme for CAT and similar psychosocial interventions (van Dam et al., 2020).

4.4 | Relevance statement

This research describes the mental health nursing staff's perspective on the barriers and facilitators to implementation of an effective



intervention for people diagnosed with a SMI. The manuscript is relevant for this journal as it may help innovators to improve implementation of interventions by taking into account the barriers and facilitators. Based on this study, future implementation should focus on ongoing training and supervision of CAT specialists, appointment of local champions to increase commitment and inclusion and commitment of management to overcome organizational barriers. Thereby, this research helps service users to benefit more from the effective interventions.

ACKNOWLEDGEMENTS

The authors thank all mental health nurses for their time and effort in participation of this research. This study received funding from NutsOhra (grant number: 103-041).

AUTHOR CONTRIBUTIONS

All authors contributed to the design of the study. Michelle van Dam collected the data, performed the analysis and wrote the first draft of the manuscript. All authors discussed the results, provided feedback and contributed to the final version of the manuscript.

ETHICS APPROVAL

The protocol was approved by The Medical Ethical Committee of the University Medical Center Groningen in The Netherlands (M13.143271). The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and the Helsinki Declaration of 1975.

DATA AVAILABILITY STATEMENT

The data supporting the findings of this study are saved at Lentis Psychiatric Institute and is accessible to members of the research team. For any questions regarding the data, please contact the corresponding author.

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How to cite this article: van Dam, M., van Weeghel, J., Stiekema, A., Castelein, S., Pijnenborg, M., & van der Meer, L. (2022). Barriers and facilitators to implementation of cognitive adaptation training in long-term inpatient facilities for people diagnosed with severe mental illness: A nursing perspective. *Journal of Psychiatric and Mental Health Nursing*, 29, 568–577. <https://doi.org/10.1111/jpm.12821>