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Informal antidepressant strategies for nursing home residents: two group concept mapping studies

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ABSTRACT

Objectives: To identify and structure potential informal antidepressant strategies that can be used in daily practice for nursing home residents alongside formal treatments.

Methods: In a first Group Concept Mapping study, residents, relatives, and professional caregivers ($N = 124$) brainstormed on strategies residents could use to prevent or alleviate depression. In a second study, the same participants ($N = 110$) reported strategies for use by others. Furthermore, participants rated the expected effectiveness and feasibility of the suggested strategies. Simultaneously, all strategies were sorted by experts and clustered using multidimensional scaling and hierarchical cluster analysis.

Results: Six clusters emerged for strategies by residents themselves and five clusters for strategies by others. For residents' strategies, the clusters *Being socially connected* and *Participating in activities* were perceived as most effective, as was the cluster *Offering personal attention* for strategies by others. Participants perceived *Creating a healthy living environment* as the most feasible cluster executed by residents. Within strategies by others, the clusters *Offering personal attention*, *Using positive treatment/approach*, and *Using or adapting the physical environment* were perceived as the most feasible.

Conclusion: The results indicated the importance of social connectedness, a personalized and positive approach by significant others, and tailored activity programs. The results also suggest that adaptations to the physical environment within nursing homes may be an easy applicable strategy to prevent or alleviate depression in residents. Although more research is needed, these findings may guide daily practice and the development of interventions that include informal strategies.

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Depression; nursing home; group concept mapping; informal antidepressant strategies; mood

Introduction

Depressive disorders and depressive symptoms (further referred to as depression) are common in nursing home (NH) residents worldwide (Assariparambil et al., 2021; Nazemi et al., 2013; Seitz et al., 2010; Tiong et al., 2013) and affect nearly half of all residents with dementia and almost one quarter of those without dementia (van Asch et al., 2013). Depression in older people is associated with various negative outcomes including increased mortality (Barca et al., 2009; Kane et al., 2010), low quality of life (Henskens et al., 2019; Sivertsen et al., 2015), and increased risk of hospitalization and utilization of other health care services (Bartels et al., 2003; Luo et al., 2015; Smalbrugge et al., 2006). Research suggests that, in addition to formal treatments such as antidepressant medication and psychotherapy, informal antidepressant strategies may be helpful in NHs (Meeks & Looney, 2011). For example, caregivers may seat a resident with depression at a table near the window because they have noticed earlier that sitting near the window improved the resident's mood. Sitting near the window may have antidepressant effects due to extra daylight or pleasant views from the window (Aries et al., 2015; Beute & de Kort, 2014). To further improve depression care, it is important to learn from informal antidepressant strategies already being used successfully in

daily practice, alongside or instead of formal treatment (Leontjevas et al., 2013; Meeks & Looney, 2011).

Previous studies suggest that informal strategies that can mitigate depression may be applied by residents, their relatives, and professional caregivers in daily practice. For example, several studies reveal self-management coping strategies in residents, including taking a walk, having a positive attitude, and seeking company (Choi et al., 2008; Tsai, 2006). Other studies suggest that participating in pleasant activities—in particular, activities that include social involvement and interaction (Beerens et al., 2018; Cohen-Mansfield, 2018; Knippenberg et al., 2021; Owen et al., 2021), activities that are meaningful (Harmer & Orrell, 2008; Owen et al., 2021; van Corven et al., 2021), and activities that are informal and tailored to the individual (Mbakile-Mahlanza et al., 2020; Meeks et al., 2007; Meeks & Looney, 2011)—may reduce or have a protective effect against depression in residents. The importance of a personalized and stimulating approach of caregivers, and an interpersonal and reciprocal relationship between the resident and caregiver was recognized as well (Cheng et al., 2010; Gilmore-Bykovskiy et al., 2015; Meeks & Looney, 2011; Nakrem et al., 2011; Vernooij-Dassen et al., 2011). Moreover, another study indicated that quality of life of residents improved after depression assessment procedures were conducted by staff, even

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without subsequent formal treatment (Leontjevas et al., 2013), which may suggest that residents themselves, or others important in residents' lives, may apply informal antidepressant strategies. Although gaining insight into these strategies is important in learning how to improve depression care, to the best of our knowledge, exploration of such strategies has not been performed systematically.

The aim of this study was, hence, to systematically identify and structure potential informal antidepressant strategies for NH residents that can be used in daily practice by residents themselves or significant others, from the perspective of residents, their relatives, and professional caregivers. Furthermore, this study aimed to categorize key elements of informal antidepressant strategies and to describe their expected effectiveness and feasibility. Revealing and prioritizing these strategies by using a bottom-up approach allows innovations to be discovered and interventions to be developed in addition to using theory-driven approaches.

Material and methods

Transparency and openness

This article follows the APA Style Journal Article Reporting Standards (APA Style JARS) (Levitt et al., 2018). Research materials, anonymized data, and analysis code are available from the corresponding author upon request. Data were analyzed using the Global MAXTM software (2019) and SPSS 25 (IBM Corp., Released 2017).

Ethics statement

Ethical clearance was obtained from the Medical Ethics Review Committee of the Arnhem-Nijmegen region (CMO Radboudumc, reference number: 2019-5464). The study was conducted in accordance with the Declaration of Helsinki as well as the rules applicable in the Netherlands. Only participants who provided informed consent (by using a paper document or online form) were included.

Group Concept Mapping

Group Concept Mapping (GCM) was used to identify and structure informal antidepressant strategies for NH residents. GCM is a participatory multiphase mixed-methods approach consisting of brainstorming, idea synthesis, idea structuring (sorting and rating), and analysis and interpretation (Kane & Trochim, 2007; Rosas, 2017). A major advantage of GCM is that it is particularly useful for detailed idea generation by a diverse research population and for structuring and representing the content of complex concepts by integrating qualitative group processes with multivariate statistical analysis (Kane & Rosas, 2017). GCM applies user-friendly methods familiar to most people for data collection (e.g. expressing opinions in their own words and rating ideas according to particular dimensions, e.g. regarding expected effectiveness and feasibility). Moreover, GCM enables researchers to objectively reveal potential barriers and facilitators of the proposed strategies (Kane & Rosas, 2017). In the present research, two GCM studies were conducted simultaneously to examine strategies that can be used by 1) NH residents themselves (Study 1) and 2)

significant others, i.e. those in the residents' (social) environment (Study 2).

Participants

For both GCM studies, NH residents, relatives, and professional caregivers were invited to participate. Participants were recruited from five NHs associated with the University Network of Care Homes Nijmegen (UKON, a Dutch infrastructure for academic long-term care) (Koopmans et al., 2013) and through professional networks of the researchers.

Eligibility criteria for residents were as follows: 1) stay in a NH unit that provides medical-somatic care, psychogeriatric care, or mental-physical multimorbidity care and 2) ability to provide informed consent. Residents with a life expectancy of less than six months or a severe mental or cognitive condition that might have a major impact on their participation in the study were excluded. Relatives could participate in the study if 1) they were aged 18 years or older and 2) the associated NH resident resided in a NH unit providing medical-somatic care, psychogeriatric care, or mental-physical multimorbidity care. All types of professional caregivers (e.g. nurses, physicians, psychologists, spiritual counselors, musical therapists) aged 18 years or older and employed at one or more of the aforementioned NH care units were eligible to participate in the study. A relationship between members of these participant groups was allowed but not required (e.g. an eligible family member could participate in the study, irrespective of whether the related resident participated in one of the studies).

Procedure and materials

A professional caregiver (registered nurse, psychologist, or elderly care physician; Koopmans et al., 2010) determined whether residents, relatives, and professional caregivers were eligible for the study. All eligible participants were approached by one of the researchers. Residents received an information letter and were subsequently visited by one of the researchers who verbally provided additional information about the study's purpose and confidentiality issues. Relatives and professional caregivers received the information letter by post or email and could contact the researcher for questions by phone or email. After eligible participants provided their informed consent and socio-demographic characteristics, they could participate.

To collect the data, one of the researchers conducted individual face-to-face structured interviews with residents. A professional caregiver provided information about residents' depression. Relatives and professional caregivers were given the opportunity to participate face-to-face or online. For the GCM's brainstorm phase, they could also choose to participate individually or in a group.

Data were collected using LimeSurvey (LimeSurvey Project Team & Schmitz, 2015) and the Concept Systems Global MAXTM software (2019), either by one of the researchers who entered the data obtained from subjects who participated face-to-face, or by participants themselves (if they participated online). Data were collected between October 2019 and February 2021.

GCM phases

Brainstorming. (October 2019 to February 2020). In a first round of both studies, participants were asked to generate

specific statements by completing an incomplete sentence (a 'focus prompt') from their own perspective as often as they wanted. The focus prompts of both GCM studies are presented in Table 1. These prompts were developed by the authors of the manuscript, who discussed them until consensus was reached. Before the research was conducted, the prompts were pretested with five participants (professional caregivers), focusing on clarity.

Idea synthesis. (March to April 2020). To obtain a representative and practicable (in terms of sorting and rating) list of unique, relevant, and unambiguously formulated statements, the process proceeded with the researchers reducing and editing the generated set of statements of both studies. Researchers aimed to limit the final set of statements to 100 or fewer as recommended (Kane & Trochim, 2007). Using the guidelines outlined by Kane and Trochim (2007), statements containing multiple ideas were split into two or more distinct statements by a researcher. The researcher then coded all statements and subsequently allocated the statements to themes and underlying categories to better identify duplicates. All statements were, then, coded and subsequently allocated to themes and underlying categories to better identify duplicates. Afterward, the emerging codes were carefully checked for duplicates (wording) and level of detail by two researchers. While codes that were too specific were aggregated to a code with a higher level of abstraction (e.g. 'looking at personal photos' and 'recording the course of life' were aggregated to 'retrieving precious memories'), duplicate codes and codes that were represented by other specific codes were removed, as well as those that were too broadly formulated (e.g. 'to activate'). To establish a consistent set of statements in accordance with the brainstorming prompt, we edited the codes if needed (e.g. we chose to use the word 'resident' in all statements instead of 'patient' or 'client'). Finally, the original statements were checked by two other researchers and subsequently discussed to reach consensus, resulting in a final set of statements for each study.

Idea structuring. (July to November 2020). In a second round for both studies, the final set of statements was rated by participants from the brainstorming phase using 5-point scales for expected effectiveness (1 = *not at all or very limited effectiveness*, 5 = *very effective*) and feasibility (1 = *[almost] never feasible*, 5 = *[almost] always feasible*). Meanwhile, 13 experts with backgrounds in psychology, nursing sciences, health sciences, or human movement sciences, and with expertise in research and clinical practice regarding older persons, NH care, depression, dementia, or health promotion, sorted the statements into groups based on content similarity.

Analysis and interpretation. (December 2020 to February 2021). Using multidimensional scaling and hierarchical cluster analysis, several cluster maps were produced based on the sorted statements using the Global MAX™ software (2019). First, we examined the stress values for both studies. A high stress level indicates considerable variability in the way experts sorted the statements, which may imply that the overarching construct (i.e. informal antidepressant strategies) is complex (Kane & Trochim, 2007). On the other hand, a low stress value indicates that participants sorted the statements in a similar way, suggesting that the construct is more simply structured and generally agreed upon (Kane & Trochim, 2007). Kane and Trochim (2007) reported that approximately 95% of the concept mapping studies yield stress values that range between 0.205 and 0.365 ($M=0.285$, $SD = .04$). A meta-analytic study of 69 GCM studies confirmed that 96% of the sample had a stress value that fell within this range (Rosas & Kane, 2012). Based on a simulation study with 100 statements scaled in two dimensions, there is a 1% chance that stress values below 0.39 reflect maps with statements that are randomly sorted or without structure (Sturrock & Rocha, 2000). Therefore, in this study, we interpreted the stress values against the upper limit of 0.39.

Second, we explored whether a similarity cut-off value should be used that reflects the number of sorters who paired two statements together (Concept Systems Incorporated, 2017). Using a similarity cut-off value of 1 for Study 2 resulted in maps that could be interpreted more easily as compared to the default (no similarity cut-off). Therefore, a cut-off value of 1 was applied for Study 2, meaning that statements that were paired together by only one sorter were not regarded as being paired at all (i.e. values in the similarity matrix at or below the cut-off value are set to 0 (Concept Systems Incorporated, 2017)).

Third, based on hierarchical cluster analysis, different solutions for clustering the statements (ranging between four and eight clusters for each study) were discussed using two interpretation workshops. In these workshops, experts ($N=7$) and health care professionals ($N=9$) discussed these solutions by taking into account the content, and bridging values of the statements and clusters. Bridging scores can range between 0 and 1. Lower bridging scores imply stronger agreement on the clustering of the statements, while higher bridging scores indicate that statements were grouped together less often by participants in the sorting phase. Before the workshops, experts and professional caregivers were asked to select the most suitable number of clusters (i.e. the number of clusters that best represents the separate main themes within informal strategies) and to assign a descriptive label to each cluster. During the workshops, participants discussed these topics until consensus was reached.

Finally, for the two cluster maps that were deemed to best represent the main themes (one map for each study), rating data were analyzed and visualized in cluster rating maps (visual representation of cluster ratings on the cluster map) and

Table 1. Focus prompts used in the two GCM studies.

	Nursing home residents	Relatives and professional caregivers
Strategies that can be used by residents themselves (Study 1)	'My mood can improve if I...[informal action].'	'The mood of a nursing home resident can improve if he/she...[informal action].'
Strategies that can be used by significant others (Study 2)	'My mood can improve if relatives or professional caregivers...[informal action].'	'The mood of a nursing home residents can improve if relatives or professional caregivers...[informal action].'

relative pattern matches (bivariate comparison of cluster ratings) that depict average cluster ratings for effectiveness and feasibility using the Global MAX™ software (2019). Findings were discussed and validated in two interpretation workshops with experts ($N=4$ and $N=3$) and two interpretation workshops with health care professionals ($N=9$ and $N=6$).

Results

For both studies, socio-demographic factors of the participants are provided in Tables 2–4. In total, 124 participants (38 residents [Mean age years, 81.1; SD, 10.4] 25 relatives [59.7, 14.2], and 61 professional caregivers [43.0, 13.5]) participated in the brainstorm phase of the first study (Study 1). In the second study (Study 2), the total number of participants for the brainstorm phase was 110 (38 residents [Mean age years, 81.1; SD, 10.4], 22 relatives [58.7, 14.3], and 50 professional caregivers [43.2, 14.0]). For both studies, five face-to-face group brainstorm meetings were held, one with relatives ($N=6$) and four with professional caregivers (total $N=35$, range = 4–13 participants per session). The remainder of the participants participated individually.

Of the 124 participants in the brainstorm phase of Study 1, 46 participants (6 residents, 21 relatives, and 19 professional caregivers) individually rated the statements for expected effectiveness, while 42 participants (6 residents, 17 relatives, and 19 professional caregivers) rated them for expected feasibility. Eight new participants (3 relatives and 5 professional caregivers) were included in the rating tasks, resulting in a total of 54 participants for the effectiveness rating and 50 participants for the feasibility rating.

In Study 2, of the 110 participants in the brainstorm phase, 37 participants (6 residents, 17 relatives, and 14 professional caregivers) rated the expected effectiveness and 36 participants (6 residents, 16 relatives, and 14 professional caregivers) rated the expected feasibility. Fourteen new participants (3 relatives and 11 professional caregivers) were included in the rating tasks, raising the total number of participants rating effectiveness to 51 and the total number of participants rating feasibility to 50.

Study 1: Antidepressant strategies for use by residents

In total, 472 statements were generated by 124 participants. After idea synthesis, the final set of statements contained 83 unique and unambiguously formulated statements. The stress

value of Study 1 (0.33 after 15 iterations) was below the recognized upper limit.

During the interpretation workshops, it was agreed that six clusters was the optimum number for representing separate main themes within informal antidepressant care as performed by residents. These clusters were labeled as 1) *Participating in activities* (e.g. 'undertakes creative activities [e.g. flower arranging, painting, crafts, drawing, handicrafts]'), 2) *Reciprocity/having one's own role in interaction* (e.g. 'approaches others in a friendly way'), 3) *Being socially connected* (e.g. 'keeps in touch with his/her family or friends'), 4) *Creating a healthy living environment* (e.g. 'lets in daylight [e.g. opening the curtains]'), 5) *Having a positive perspective* (e.g. 'looks at what is going well'), and 6) *Expressing emotions and opinions* (e.g. 'says what he/she expects of others'). See Figure 1 for the Cluster Map. Appendix A (Supplemental Materials) lists the statements that illustrate each cluster and presents average bridging values and rating scores for each cluster and the underlying statements. The bridging values of individual clusters indicated that experts agreed relatively strongly in terms of sorting statements within the clusters *Having a positive perspective* (bridging value = 0.21) and *Expressing emotions and opinions* (bridging value = 0.29), while their level of agreement was relatively low on the clusters *Reciprocity/having one's own role in interaction* (bridging value = 0.64) and *Creating a healthy living environment* (bridging value = 0.66).

Average cluster ratings for effectiveness and feasibility are presented in Table 5. In terms of expected effectiveness, the clusters *Being socially connected* ($M=4.0$, $SD=0.6$) and *Participating in activities* (4.0, 0.6) stood out the most (the overall mean score for effectiveness = 3.9, $SD=0.3$), while *Creating a healthy living environment* stood out most in terms of expected feasibility (3.7, 0.4; overall mean score was 3.2, $SD=0.5$).

Figure 2 (Relative Pattern Match) shows that whereas the clusters *Being socially connected* and *Participating in activities* scored relatively high on effectiveness and relatively low on feasibility, it was the other way around for the cluster *Creating a healthy living environment*. The cluster *Having a positive perspective* scored relatively low on both effectiveness and feasibility.

Study 2: Antidepressant strategies for use by people in the residents' social environment

The brainstorm phase with 110 participants yielded 509 statements of strategies that may be applied by people in

Table 2. Socio-demographic factors of participating NH residents for Study 1 and 2.

	Brainstorm, $N=38$	Rating effectiveness & feasibility, $N=6$
Age, mean (SD) [range]	81.1 (10.4) [57–96]	86.5 (5.3) [80–94]
Sex, female, N (%) / male, N	26 (68.4) / 12	5 (83.3) / 1
Marital status		
Unmarried, N (%)	4 (10.5)	0 (0)
Married or partnered in a registered partnership, N (%)	9 (23.7)	0 (0)
Widowed (after marriage or registered partnership), N (%)	20 (52.6)	6 (100)
Divorced (after marriage or registered partnership), N (%)	5 (13.2)	0 (0)
Educational attainment ^a		
Low, N (%)	30 (81.1)	5 (83.3)
Medium, N (%)	5 (13.5)	0 (0)
High, N (%)	2 (5.4)	1 (16.7)
Care unit		
Medical-somatic care, N (%)	21 (55.3)	6 (100)
Psychogeriatric care, N (%)	6 (15.8)	0 (0)
Mental-physical multimorbidity care, N (%)	11 (28.9)	0 (0)
Depression		
Diagnosed with major depressive disorder or dysthymia, N (%)	10 (28.6)	2 (33.3)
Presence of depressive symptoms, no diagnosis, N (%)	11 (31.4)	1 (16.7)
No depressive symptoms, N (%)	14 (40.0)	3 (50.0)

Note. In both studies (Study 1 and Study 2), the same residents participated. Of the 38 residents that participated in the brainstorm phase, six (15.8%) rated the expected effectiveness and feasibility of the suggested strategies. Valid percentages are shown. ^aAccording to the International Standard Classification of Education (ISCED).

Table 3. Socio-demographic factors of participating relatives for Study 1 and 2.

	Study 1			Study 2		
	Brainstorm, N = 25	effectiveness, N = 24	Rating feasibility, N = 20	Brainstorm, N = 22	effectiveness, N = 20	Rating feasibility, N = 19
Age, mean (SD) [range]	59.7 (14.2) [29-83]	57.7 (13.2) [29-83]	58.7 (13.5) [29-83]	58.7 (14.3) [29-83]	58.4 (13.6) [29-83]	58.8 (13.9) [29-83]
Sex, female, N (%) / male, N	17 (68.0) / 8	17 (70.8) / 7	15 (75.0) / 5	14 (63.6) / 8	14 (70.0) / 6	14 (73.7) / 5
Educational attainment ^a						
Low, N (%)	8 (32.0)	7 (29.2)	6 (30.0)	7 (31.8)	6 (30.0)	6 (31.6)
Medium, N (%)	6 (24.0)	4 (16.7)	4 (20.0)	4 (18.2)	4 (20.0)	4 (21.1)
High, N (%)	11 (44.0)	13 (54.2)	10 (50.0)	11 (50.0)	10 (50.0)	9 (47.4)
Kinship						
Residents' partner, N (%)	8 (32.0)	5 (20.8)	5 (25.0)	7 (31.8)	5 (25.0)	5 (26.3)
Residents' son/daughter (in-law), N (%)	15 (60.0)	17 (70.8)	13 (65.0)	14 (63.6)	13 (65.0)	12 (63.2)
Other, N (%)	2 (8.0)	2 (8.3)	2 (10.0)	1 (4.5)	2 (10.0)	2 (10.5)
Residents' care unit						
Medical-somatic care, N (%)	11 (44.0)	9 (37.5)	6 (30.0)	8 (36.4)	6 (30.0)	6 (31.6)
Psychogeriatric care, N (%)	13 (52.0)	14 (58.3)	13 (65.0)	13 (59.1)	13 (65.0)	12 (63.2)
Mental-physical multimorbidity care, N (%)	1 (4.0)	1 (4.2)	1 (5.0)	1 (4.5)	1 (5.0)	1 (5.3)
Residents' depression						
Diagnosed with major depressive disorder or dysthymia, N (%)	4 (17.4)	3 (13.0)	3 (15.0)	4 (19.0)	3 (15.0)	3 (15.8)
Presence of depressive symptoms, no diagnosis, N (%)	11 (47.8)	12 (52.2)	10 (50.0)	9 (42.9)	11 (55.0)	10 (52.6)
No depressive symptoms, N (%)	8 (34.8)	8 (34.8)	7 (35.0)	8 (38.1)	6 (30.0)	6 (31.6)

Note. The majority of the relatives that participated in the brainstorm phase of Study 1 also generated statements for Study 2 (88%). In the rating tasks of both studies, three new relatives were included. The remainder of the relatives in the rating tasks also participated in the brainstorm phase. Valid percentages are shown. ^a According to the International Standard Classification of Education (ISCED).

Table 4. Socio-demographic factors of participating professional caregivers for Study 1 and 2.

		Study 1		Study 2	
		Brainstorm, N=61	Rating effectiveness & feasibility, N=24	Brainstorm, N=50	Rating effectiveness & feasibility, N=25
Age, mean (SD) [range]		43.0 (13.5) [20-66]	40.9 (11.0) [25-58]	43.2 (14.0) [20-66]	42.3 (12.6) [25-61]
Sex, female, N (%) / male, N		52 (86.7) / 8	21 (91.3) / 2	43 (86.0) / 7	22 (88.0) / 3
Educational attainment ^a	Low, N (%)	8 (13.1)	0 (0)	8 (16.0)	1 (4.0)
	Medium, N (%)	30 (49.2)	10 (41.7)	25 (50.0)	10 (40.0)
	High, N (%)	23 (37.8)	14 (58.3)	17 (34.0)	14 (56.0)
Type of healthcare provider	Nursing assistant / certified nursing assistant / registered nurse, N (%)	30 (50.0)	8 (33.3)	26 (53.1)	11 (44.0)
	Recreational therapist / activity coordinator / well-being coordinator / musical therapist / spiritual carer / living room assistant, N (%)	15 (25.0)	6 (25.0)	13 (26.5)	5 (20.0)
	Physical therapist, N (%)	3 (5.0)	1 (4.2)	1 (2.0)	1 (4.0)
	Psychologist, N (%)	5 (8.3)	4 (16.7)	5 (10.2)	4 (16.0)
	Nurse specialist / physician / elderly care physician, N (%)	4 (6.7)	3 (12.5)	2 (4.1)	3 (12.0)
	Other, N (%)	3 (5.0)	2 (8.3)	2 (4.1)	1 (4.0)
	Years of experience, mean (SD) [range]	12.2 (12.6) [0.3-43]	10.9 (10.2) [0.5-32]	12.3 (12.8) [0.3-43]	12.3 (10.6) [0.6-32]
	Unit(s) employed	Medical-somatic care, yes, N (%) / no, N	29 (48.3) / 31	15 (62.5) / 9	23 (46.9) / 26
Psychogeriatric care, yes, N (%) / no, N		30 (50.0) / 30	21 (87.5) / 3	21 (42.9) / 28	19 (76.0) / 6
Mental-physical multimorbidity care, yes, N (%) / no, N		25 (41.7) / 35	4 (16.7) / 20	23 (46.9) / 26	6 (24.0) / 19

Note. The majority of the professional caregivers that participated in the brainstorm phase of Study 1 also generated statements for Study 2 (82%). In the rating tasks of both studies, 11 new professionals were included. The remainder of the professionals in the rating tasks also participated in the brainstorm phase. Valid percentages are shown. ^a According to the International Standard Classification of Education (ISCED).

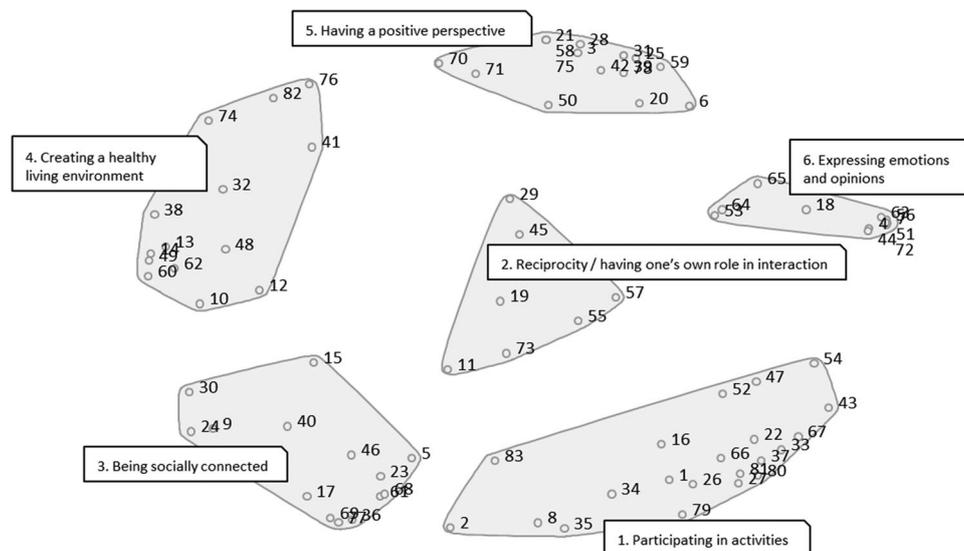


Figure 1. Cluster map for Study 1. Cluster Map with six main themes (clusters) representing informal antidepressant care as may be performed by nursing home residents themselves. Individual statements are indicated by numbers.

the residents' social environment, of which 97 were used in the final set of statements after idea synthesis. The study showed an acceptable stress value of 0.31 after eight iterations.

Based on consensus in the interpretation workshops, five clusters were determined to be optimal in representing informal antidepressant care as performed by others important in resident's lives. The clusters were named as follows: 1) *Offering personal attention* (e.g. 'give him/her extra attention when he/she is having a hard time'), 2) *Using positive treatment/approach* (e.g. 'radiate happiness [e.g. enthusiasm, laughter]'), 3) *Stimulating participation* (e.g. 'support him/her in contributing to others [e.g. tell if he/she can help other residents]'), 4) *Using or adapting the*

physical environment (e.g. 'create an open environment [e.g. few closed doors, fenced garden accessible to everyone]'), 5) *Activating/encouraging* (e.g. 'stimulate his/her senses [e.g. sniffing, using fragrances, sounds, magic table]'). See Figure 3 for the Cluster Map and Appendix B (Supplemental Materials) for the statements that belong to each cluster, including bridging and average rating scores for each cluster and statement. The bridging values per cluster implied that experts agreed relatively strongly on sorting statements within the clusters *Activating/encouraging* (bridging value = 0.23) and *Offering personal attention* (bridging value = 0.26), but the level of agreement was relatively low on the cluster *Stimulating participation* (bridging value = 0.54). The overall mean score for the statements was 4.0

Table 5. Cluster ratings for Study 1, Mean (SD).

Cluster	Rating effectiveness						Rating feasibility					
	Total, N = 54	Residents, N = 6	Residents, N = 24	Relatives, N = 24	Professional caregivers, N = 24	Total, N = 50	Residents, N = 6	Residents, N = 20	Relatives, N = 20	Professional caregivers, N = 24		
1 Participating in activities	4.0 (0.6)	4.0 (0.3)	3.9 (0.7)	4.1 (0.5)	3.2 (0.5)	3.5 (0.2)	3.1 (0.5)	3.1 (0.5)	3.1 (0.5)	3.1 (0.5)		
2 Reciprocity / having one's own role in interaction	3.8 (0.6)	4.2 (0.7)	3.6 (0.6)	3.9 (0.5)	3.0 (0.6)	3.5 (0.5)	2.9 (0.5)	2.9 (0.5)	2.9 (0.5)	2.9 (0.5)		
3 Being socially connected	4.0 (0.6)	4.2 (0.2)	4.0 (0.7)	4.1 (0.4)	3.1 (0.5)	3.2 (0.2)	3.2 (0.5)	3.2 (0.5)	3.0 (0.5)	3.0 (0.5)		
4 Creating a healthy living environment	3.8 (0.5)	3.5 (0.5)	3.6 (0.5)	4.0 (0.5)	3.7 (0.4)	3.8 (0.5)	3.7 (0.4)	3.7 (0.4)	3.7 (0.5)	3.7 (0.5)		
5 Having a positive perspective	3.7 (0.6)	3.7 (0.2)	3.5 (0.6)	3.9 (0.5)	3.0 (0.5)	3.3 (0.5)	2.9 (0.4)	2.9 (0.4)	3.0 (0.5)	3.0 (0.5)		
6 Expressing emotions and opinions	3.7 (0.5)	3.8 (0.2)	3.5 (0.5)	4.0 (0.6)	3.2 (0.6)	3.7 (0.3)	3.1 (0.6)	3.1 (0.6)	3.2 (0.7)	3.2 (0.7)		

Note: Scores range from 1 (not at all or very limited effectiveness/[almost] never feasible) to 5 (very effective/[almost] always feasible).

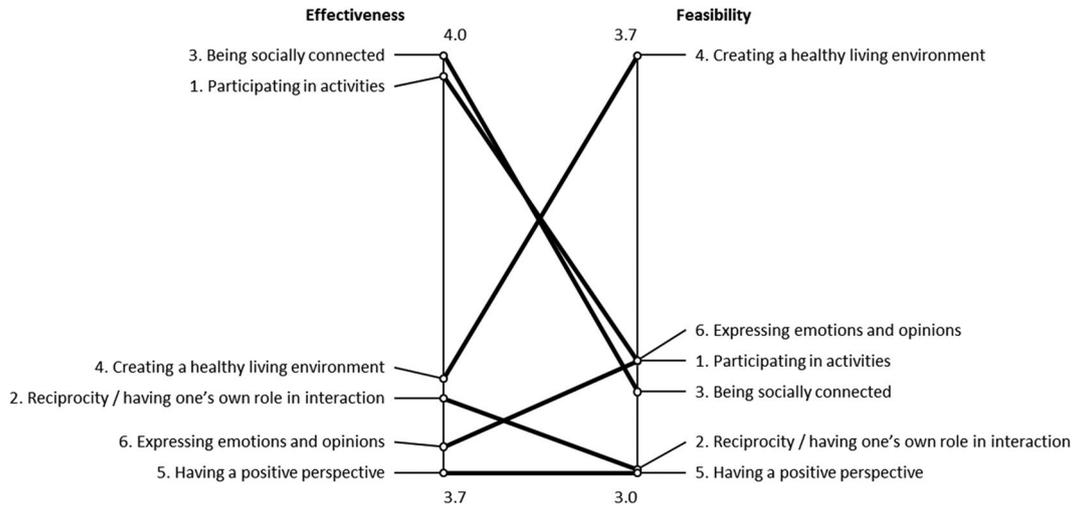


Figure 2. Relative pattern match for Study 1. Relative Pattern Match of the clusters between the dimensions effectiveness and feasibility.

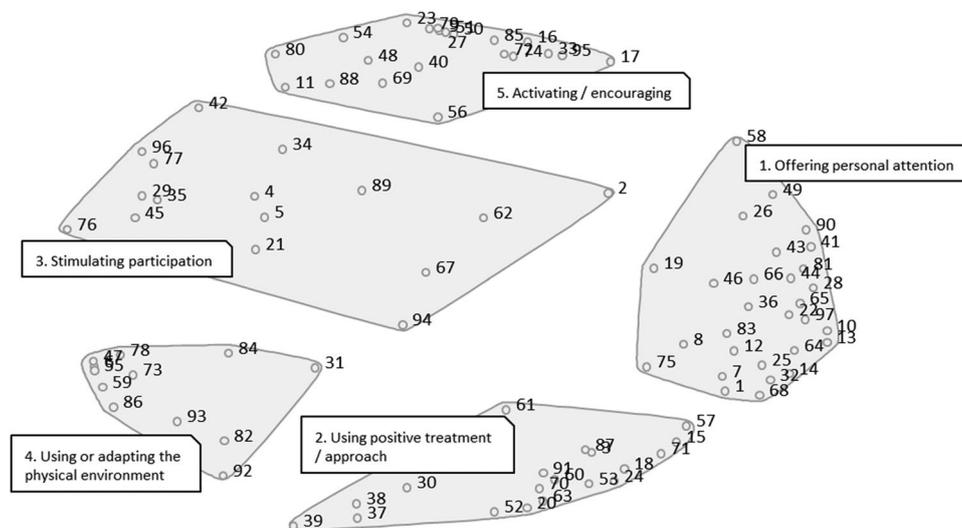


Figure 3. Cluster map for Study 2. Cluster Map with the five main themes (clusters) representing informal antidepressant care as may be performed by significant others. Individual statements are indicated by numbers.

($SD=0.3$) for effectiveness and 3.7 ($SD=0.5$) for feasibility. Table 6 presents the average cluster ratings. The cluster *Offering personal attention* stood out the most in terms of both expected effectiveness ($M=4.3$, $SD=0.3$) and feasibility (3.9, 0.4). In terms of expected feasibility, the clusters *Using positive treatment/approach* (3.9, 0.4) and *Using or adapting the physical environment* (3.8, 0.5) stood out as well. The Relative Pattern Match (Figure 4) depicts that the cluster *Offering personal attention* scored relatively high on expected effectiveness as well as expected feasibility, while *Stimulating participation* scored relatively low on both effectiveness and feasibility. The clusters *Using or adapting the physical environment* and *Using positive treatment/approach* were considered as not very effective but relatively easy to apply. On the other hand, the cluster *Activating/encouraging* was regarded as relatively effective but relatively impracticable.

Discussion

Two Group Concept Mapping studies revealed a broad variety of potential informal antidepressant strategies in NH residents. These strategies were sorted into six clusters that may be undertaken by NH residents themselves (*Participating in activities*, *Reciprocity/having one's own role in interaction*, *Being socially*

connected, *Creating a healthy living environment*, *Having a positive perspective*, and *Expressing emotions and opinions*) and five clusters of strategies that may be executed by others involved in residents' lives; i.e. relatives and professional caregivers (*Offering personal attention*, *Using positive treatment/approach*, *Stimulating participation*, *Using or adapting the physical environment*, *Activating/encouraging*). The results showed that, for strategies for use by residents themselves, the clusters *Being socially connected* and *Participating in activities* were perceived as most effective as was the cluster *Offering personal attention* for strategies by others. Participants perceived *Creating a healthy living environment* as the most feasible cluster with strategies executed by residents. Within strategies by others, the clusters *Offering personal attention*, *Using positive treatment/approach*, and *Using or adapting the physical environment* were perceived as the most feasible.

The clusters revealed in our GCM studies are consistent with results of previous studies that indicate that, for example, (stimulating) participation, (encouraging) social interaction, and having a positive attitude may promote positive mood in residents (Beerens et al., 2018; Choi et al., 2008; Cohen-Mansfield, 2018; Knippenberg et al., 2021; Meeks et al., 2007; Meeks & Looney, 2011; Owen et al., 2021; Tsai, 2006). Although a previous study showed no longitudinal association between the overall physical

Table 6. Cluster ratings for Study 2, Mean (SD).

Cluster	Rating effectiveness					Rating feasibility						
	Total, N = 51	Residents, N = 6	Relatives, N = 20	Professional caregivers, N = 25	Total, N = 50	Residents, N = 6	Relatives, N = 19	Professional caregivers, N = 25	Total, N = 50	Residents, N = 6	Relatives, N = 19	Professional caregivers, N = 25
1 Offering personal attention	4.3 (0.3)	4.1 (0.2)	4.3 (0.2)	4.2 (0.5)	3.9 (0.4)	3.8 (0.2)	4.0 (0.4)	3.8 (0.5)	3.9 (0.4)	3.8 (0.2)	4.0 (0.4)	3.8 (0.5)
2 Using positive treatment / approach	3.9 (0.4)	4.0 (0.2)	3.9 (0.3)	4.0 (0.5)	3.9 (0.4)	3.8 (0.3)	3.9 (0.4)	3.9 (0.5)	3.9 (0.4)	3.8 (0.3)	3.9 (0.4)	3.9 (0.5)
3 Stimulating participation	3.9 (0.6)	4.2 (0.5)	3.9 (0.3)	3.6 (0.7)	3.3 (0.6)	3.6 (0.2)	3.3 (0.6)	3.6 (0.2)	3.3 (0.6)	3.6 (0.2)	3.3 (0.6)	3.1 (0.6)
4 Using or adapting the physical environment	4.0 (0.4)	3.9 (0.1)	3.9 (0.4)	4.0 (0.5)	3.8 (0.5)	4.1 (0.4)	3.7 (0.5)	4.0 (0.5)	3.8 (0.5)	4.1 (0.4)	3.7 (0.5)	3.7 (0.6)
5 Activating / encouraging	4.0 (0.4)	4.0 (0.1)	4.1 (0.3)	3.9 (0.5)	3.3 (0.6)	3.3 (0.4)	3.3 (0.6)	3.9 (0.5)	3.3 (0.6)	3.3 (0.4)	3.3 (0.6)	3.1 (0.6)

Note: Scores range from 1 (not at all or very limited effectiveness/[almost] never feasible) to 5 (very effective/[almost] always feasible).

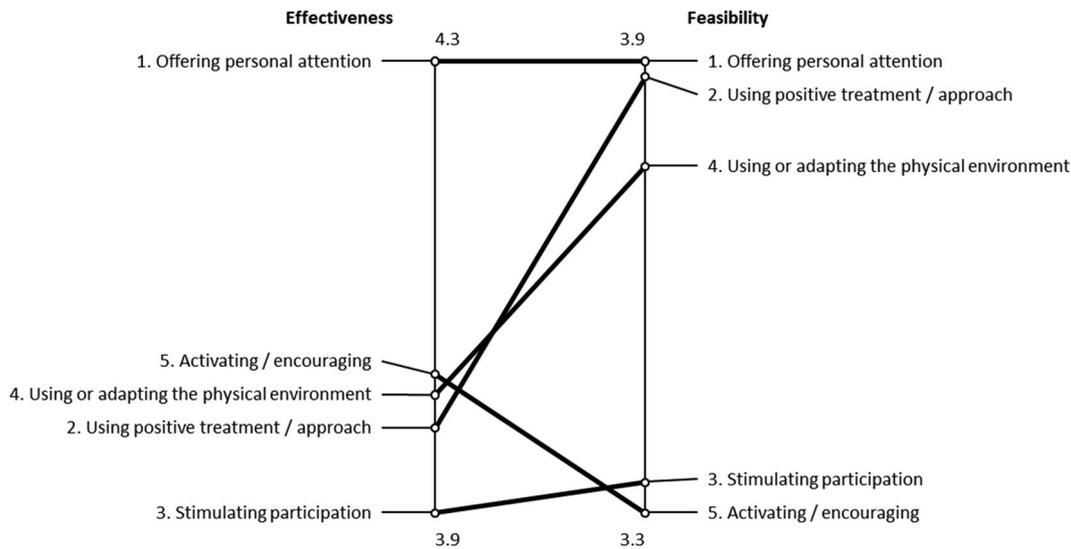


Figure 4. Relative pattern match for Study 2. Relative Pattern Match of the clusters between the dimensions effectiveness and feasibility.

environment and depressive symptoms of residents living in care homes (Potter et al., 2018), our results suggest an important role for the physical environment in improving mood in residents, for example, creating a green environment inside the NH by, for example, using plants, smells or photos. Even though the expected effectiveness is relatively moderate, using or adapting elements within the physical environment may be a relatively easy way to influence the mood of residents. It should, however, be noted that in our study, we focused on the beliefs of participants and did not test actual effects of clusters of strategies on residents' depression, nor did we assess whether these strategies are actually put into practice.

Our findings suggest that, although some clusters of strategies could be quite effective, they also appear to be relatively difficult to apply. In contrast, other clusters that seem less effective may be easier to apply. With regard to social connectedness (a cluster for strategies employed by residents themselves that is regarded as relatively effective), it can be argued that physical or cognitive limitations of many NH residents may explain the relatively low expected feasibility. However, Mabire et al. (2016) found that residents with dementia spontaneously interact with other residents and care staff. Our result might be attributed to the fact that we asked participants about expected feasibility, and did not test whether this is actually done.

On the other hand, adapting the physical living environment (a somewhat similar cluster for strategies for use by both residents themselves and by others important in their lives, and considered as quite feasible) and using a positive approach by others important in residents' lives, seem promising in terms of ease of implementation. Future research may shed a light on the compound effect of several feasible strategies with relatively low effectiveness as compared to the effect of strategies that are promising in terms of their effectiveness but difficult to apply in practice.

It should be noted that all clusters were rated 3.0 or above on a scale from 1 to 5 on both effectiveness and feasibility. Moreover, almost all individual statements were scored at least 3.0 on both effectiveness and feasibility. This indicates that the statements revealed in the brainstorm stage were considered at least both moderately effective and moderately feasible. It makes sense that participants mainly mentioned those strategies that seem realistic in depression care and have some effect

on residents' mood. However, the small range of scores makes it difficult to compare specific (clusters of) strategies with each other regarding expected effectiveness and feasibility. Nevertheless, we believe our findings may inform NH practice by prioritizing these strategies.

In general, our findings suggest an important role for social connectedness of residents and a personalized and positive approach by health care professionals and relatives in depression care, which is in accordance with previous research (Cheng et al., 2010; Gilmore-Bykovskiy et al., 2015; Hsu & Wright, 2019; Mackenzie & Abdulrazaq, 2021; Mbakile-Mahlanza et al., 2020; Meeks & Looney, 2011; Nakrem et al., 2011; Sjögren et al., 2013). The results also confirm the results of previous research on the importance of tailored activity programs (e.g. activities that are meaningful for the resident or activities that support autonomy or social engagement) (Harmer & Orrell, 2008; Owen et al., 2021; van Corven et al., 2021) and suggest that adaptations to the physical environment within NHs (e.g. using daylight or creating hominess [cheerful colors, cozy tables]) may be an easy applicable and moderately effective strategy to prevent or alleviate depression in residents.

Strengths and limitations

Using a systematic participatory mixed-methods approach, this research provides a wide range of potential informal antidepressant strategies and their expected effectiveness and feasibility. A diverse group of stakeholders commonly involved in residents' well-being was able to provide their input enabling us to capture a broad view on informal antidepressant strategies in NHs. A major strength of this study is that, in addition to perspectives of relatives and professional caregivers, we included the views of residents themselves regarding strategies that they perform or may perform as well as strategies used or may be used by others. Furthermore, since the cluster structure emerged from the data through multivariate statistics after the statements were sorted by multiple experts, the maps provide a more objective reflection of separate clusters than a solely qualitative approach with fewer participants would have provided.

We observed that more—and more detailed—strategies were mentioned by participants in the group sessions than in

individual sessions of the brainstorm phase. This suggests that using group sessions next to individual sessions has added value in collecting a large variety of statements in the brainstorm phase (data triangulation). Therefore, we suggest future research to include group sessions alongside individual sessions when using Group Concept Mapping.

In terms of the results, we noticed commonalities between strategies that can be used by residents (Study 1) and strategies for use by others (Study 2), and similarities in the way they were sorted and rated. However, the data from our two Group Concept Mapping studies cannot be compared using quantitative analysis. Although (mainly) the same participants were involved in both studies, the idea structuring (rating and sorting of the statements) and analysis were performed on a separate set of statements for each study. To gain a comprehensive map of themes of (overarching) informal antidepressant strategies, in-depth qualitative analysis and further research is suggested.

This study has several limitations that should be considered. First, although some strategies could be more effective (or feasible) in particular resident groups, the limited number of participants did not allow us to compare subgroups (e.g. residents with and without dementia or residents with or without depression). Second, the sorting task was done by experts, not by the target group, because of the difficulty of the task and the inability to assist participants face-to-face during the COVID-19 pandemic. Nevertheless, we believe that having experts perform the sorting task was suitable for this study. Third, input of participants in the brainstorm and rating task is essential, and this information was collected accordingly. Unfortunately, due to COVID-19 pandemic restrictions, we were able to collect rating scores from only six residents, which may be problematic for generalizing the results of this study. Finally, this study only assessed potential strategies and their hypothetical effectiveness and feasibility and not whether these strategies were actually used or what their associations with or effects on depression were. Therefore, future research is needed on actual performance of the antidepressant strategies and their subsequent effects.

Conclusion

To the best of our knowledge, our studies are the first to use a systematic bottom-up method to identify and prioritize clusters of informal antidepressant strategies in NHs. Our findings suggest an important role for social connectedness of residents and a personalized and positive approach by those in the residents' (social) environment (e.g. professional caregivers, relatives, and other residents) in depression care in NHs. The importance of tailored activity programs (e.g. activities that are meaningful for the resident or activities that support autonomy or social engagement) and paying attention to the physical environment (e.g. using daylight or creating hominess [cheerful colors, cozy tables]) within NHs was advocated as well. These findings may guide adjustments of existing procedures or may be employed in interventions. More research is needed to test the effectiveness of these strategies and to better understand barriers and facilitators to implementing them in specific resident groups.

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Data availability statement

Research materials, anonymized data, and analysis code are available from the corresponding author (IK) upon request.

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