JCN Journal of Clinical Nursing

Journal of Clinical Nursing

ORIGINAL ARTICLE

The impact of caregivers' singing on expressions of emotion and resistance during morning care situations in persons with dementia: an intervention in dementia care

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Aims and objectives. The aim was to describe expressions of emotions and resistiveness to care among persons with dementia (PWD), during morning care situations without and with music therapeutic caregiving (MTC).

Background. Effective caregiving is dependent on the interpersonal relationship between nurse and patient. PWD suffer from major cognitive impairment, making interaction with others problematic. Such patients often react with problematic behaviours such as resistance and anger towards the care activity and the caregiver. Earlier research suggests that MTC – when caregivers sing for or together with PWD during caregiving – can reduce resistance and evoke positive emotions in PWD.

Design. This was an intervention study whereby MTC was implemented during morning care situations while PWD were being cared for.

Method. The study included ten, 66–92-year-old men and women with severe dementia living in a nursing home in Sweden. Video observations of eight weekly sessions, consisting of four recordings of usual morning care and four recordings of morning care with MTC, provided data. The resistiveness to care scale and the observed emotion rating scale were used for analysis.

Results. Pull away was the most common resistant behaviour under both conditions. The PWDs' expressions of resistant behaviour, such as pull away, grab object and adduction, were significantly reduced under the intervention situation. Positively expressed emotions, specifically pleasure and general alertness, significantly increased under the MTC intervention compared with the 'usual' morning care sessions.

Conclusions. MTC can be an effective nursing intervention to provide PWD a more pleasant experience of morning care situations as it decreases resistant behaviour and increases positive emotions.

Relevance to clinical practice. MTC offers a potential non-pharmacologic treatment that can be used in caring for PWD.

Key words: caring, dementia, intervention, observed emotion rating scale, resistiveness to care scale

Accepted for publication: 8 April 2010

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doi: 10.1111/j.1365-2702.2010.03386.x

Introduction

Caregiving is at the heart of nursing. It can only be effectively demonstrated through the interpersonal relationship between nurse and patient (Boykin & Schoenhofer 1993, Watson 2008) and should involve effective communication characterised by give and take between the two (Watson 2008). The caregiving situation should be conceptualised as a shared lived experience between the nurse and the patient and is developed when the two present themselves as wanting to offer and receive professional nursing service (Boykin & Schoenhofer 1993). Persons with dementia (PWDs) suffer from major cognitive impairments, making interaction with others problematic (Buhr & White 2007, O'Connor *et al.* 2009, Penrod *et al.* 2007).In care situations, interaction with caregivers is crucial. However, PWDs often encounter difficulties recognising others and therewith engaging with them, placing strain on the caregiving situation when these difficulties result in expressions of resistance (Simard & Volicer 2009). The concept resistiveness to care is operationally defined by Mahoney *et al.* (1999) as 'behaviors to withstand or oppose the effort of the caregiver during the provision of care'. Resistiveness to care includes several behaviours including screaming, crying, pinching and clenching of the mouth (Mahoney *et al.* 1999). These behaviours can also be extended to emotional expressions, such as anger or sadness. Although PWDs' means of expressing themselves through words are commonly impaired, they remain able to express negative and positive emotions (Lawton *et al.* 1996). Negatively expressed emotions and resistance are examples of so-called behavioural and psychological symptoms of dementia (BPSD) (Finkel 2001), which refer to a wide range of behaviours such as screaming, wandering, resisting care and verbal and physical aggression. BPSD is particularly evident during the administration of personal care and can be time-consuming and challenging to manage. In an attempt to minimise BPSD, pharmacological treatments are available. However, these medications are associated with considerable side effects and provide only temporary relief (Ballard *et al.* 2009). As such, non-pharmacological treatments should be considered first (Hogan *et al.* 2008, Kverno *et al.* 2009). Non-pharmacological treatments such as care interventions are cost effective but underused although they hold the potential to reduce BPSD without the risks associated with pharmacological treatment (Herrmann & Gauthier 2008).

Reviews of care interventions, e.g. reminiscence therapy (The Swedish Council on Technology Assessment in Health Care [SBU] 2008, Woods *et al.* 2005), cognitive rehabilitation therapy (Clare *et al.* 2003), validation therapy, behavioural therapy, reality orientation, touch and massage and light therapy (SBU 2008), conclude that both qualitative and quantitative studies vary in quality, making it difficult to determine the efficacy of different interventions (Clare *et al.* 2003, The Swedish Council on Technology Assessment in Health Care (SBU) 2008, Woods *et al.* 2005). Additionally, the majority of research and intervention programmes mainly focuses on persons with mild to moderate dementia. Kverno *et al.* (2009) review non-pharmacological strategies focusing on persons with severe dementia. They consider studies concerned with aroma therapy, music listening, multi-sensory stimulation and emotion-oriented approaches, among others. Their review shows that music reduces BPSD and live music or preferred music is beneficial. However, the authors conclude that also these studies vary in quality and that more research that focuses on persons with severe dementia is needed and particularly research in interventions that can be implemented during caregiving.

Cohen-Mansfield (2009) suggests that listening to music during bathing reduces BPSD and relaxes PWDs. There is limited research available on singing as a caregiving intervention in dementia care. As the first to use this, Götell (2003) analysed video recordings of morning care situations with PWDs and their caregivers using a qualitative methodology. First, the morning care was conducted the usual way. Second, background music was played, and third, the caregiver sang for or together with the PWD, so-called music therapeutic caregiving (MTC) (Brown *et al.* 2001). The study indicates a clear advantage with using MTC; as the PWDs' problematic behaviours, such as aggression and resistance, were abated (Götell *et al.* 2003), the PWDs verbally expressed more positive emotions and moods and demonstrated improved posture and sensory awareness (Götell *et al.* 2003). To our knowledge, no quantitative studies of MTC have been published, and in attempt to further explore the use of MTC as a caregiving intervention, we designed this study to describe PWDs' expressions of resistiveness to care and expressions of emotions, while being cared for by their caregivers during morning care situations without and with MTC.

Methods

Participants

The study was conducted in two nursing homes for PWDs in an urban area of Sweden. Twelve PWDs and their ten professional female caregivers, who were nominated by the head nurses at the nursing homes, agreed to participate in the study. Of the PWDs initially selected to participate, two died during the data collection; thus, ten PWDs participated in the

study, four men and six women. According to their medical records, five individuals were diagnosed with vascular dementia and five with Alzheimer's disease. Mini-mental state examinations (Folstein *et al.* 1975) were conducted of the PWDs by the first author resulting in scores ranging from 0–12 with a mean of 3·3, indicating that they suffered from severe dementia. The participants had been living at the nursing home for one month–5 years, and the mean age (95% CI) of the participants at the time of the observation was 81·3 years, ranging from 66–92 years.

Setting and intervention

The research situation was the 'morning care situation' with the participating PWDs and the caregivers. The 'ordinary' morning care situation was the baseline situation and the intervention situation (Polit & Beck 2008) constituted morning care situations with MTC – when the caregivers sang for or together with the PWDs while caring for them. The PWDs were video-observed four times, once a week per PWD during 'ordinary' morning care situations and four times, once a week per PWD with the intervention MTC. In all, every PWD participated over a two-month period and four video observations (VIO) of the baseline situation and four VIO with the intervention MTC were made per PWD. In all, the data collection involved 80 VIOs, capturing approximately 20 hours of 10–20 minutes sequences.

A typical morning care situation involved the caregiver helping the PWD from the bed into the bathroom and the PWD sat down on the toilet and had their nightclothes removed. The PWDs' faces and upper bodies were washed, and deodorant and lotion was applied. The upper body was dressed, and the lower body was washed (not video-observed). Socks and shoes were put on, and the PWDs were led to the sink (three of them in wheelchairs) and directed towards the mirror. While at the sink, their teeth were brushed (four of them by themselves) and their hair was combed (two of them by themselves). The morning care situation ended when the PWDs left the bathroom.

To prepare for the MTC intervention, the caregivers were offered a course in MTC at Mälardalen University (MTC I, MKM019). Two of them took the course including the final exam, while the rest were instructed on how to use MTC by the first author who was certified in MTC. The caregivers sang songs and hymns that the older ordinarily would recognise from their past, such as children's songs, sing-along songs and popular songs from the early part of the 20th century. The caregivers themselves chose songs they preferred to sing. Some spoke between the songs, but only to instruct or explain something to the PWD. They sang most of the time and for the duration of the morning care situations.

Measures

The observed emotion rating scale (OERS) (Lawton *et al.* 1999a,b) was used. OERS measures expressed emotions of PWDs with the rationale that PWDs commonly have greatly reduced cognitive and communicative capacity but have the ability to display preferences or aversions through emotional expressions. The scale was developed in an attempt to allow caregivers to determine when PWDs experience good or poor moments while interacting with them and also to aid researchers in observing PWDs' expressed emotions. The OERS includes five observed facially expressed emotions for PWDs with two positively expressed emotions and three negatively expressed emotions. The positive emotions consist of pleasure and general alertness, while the negative include anger, anxiety/fear and sadness. All five expressions are rated for duration during a ten-minute observation period. Each variable representing the expressions is scored for duration according to not in view, never, < 16 seconds, 16–59 seconds, 1–2 minutes and more than five minutes. Reliability of the scale was tested and the scores of the variables ranged from 0·76–0·89. (Lawton *et al.* 1999a,b).

The second instrument used in this study was the resistiveness to care scale (RTCS) (Mahoney *et al.* 1999), which includes 13 observable behaviours indicating resistiveness to care that are rated for duration and intensity during a ten-minute observation period. The scale was developed for researchers observing PWDs' resistant behaviours. The 13 behaviours include turn away, pull away, push away, push/pull, grab object, grab person, adduct, hit or kick, say no, cry, threaten, scream or yell and clench mouth. For each variable representing the behaviours, scores of duration can range from none, < 16 seconds, 16–59 seconds, 1–2 minutes and more than two minutes. Mahoney *et al.* (1999) support the consistent reliability of this scale with internal consistency established in two long-time care dementia populations (Cronbach's alphas 0·82–0·87).

Data analysis

Data were obtained by scoring 80 weekly video-recorded sessions of morning care situations, eight per PWD (four baseline and four intervention). The instruments, OERS (Lawton *et al.* 1999a,b) and RTCS (Mahoney *et al.* 1999), were first scored by the first author (LM). A test/retest reliability was performed whereby the investigator watched all videotapes once again after a period of 10 days. An

agreement minus disagreement divided by the total observations was calculated. It yielded a reliability of 0·97, which was well within the acceptable range for reliability. A second investigator (GE) scored the same video recordings, and results were compared. Any discrepancies were discussed and resolved by consensus. The observed expressions in the OERS and the observable behaviours related to RTCS were scored for duration in seconds for each observation, and the resulting scoring of duration during baseline and during the intervention was presented in a bar chart.

Statistical analysis

A student *t*-test was used to compare the mean scores for baseline and intervention. The statistical analysis was performed with the SPSS (Statistical Package of Social Science), version 17.0 (SPSS Inc., Chicago, IL, USA); $p < 0{\cdot}05$ was considered significant.

Ethical considerations

The study was approved by the Regional Board of Research Ethics. Because the PWDs had severe dementia, they were unable to understand the information given about the study. Therefore, proxy consent was obtained from their next of kin, who were informed that participation in the study was voluntary; they could withdraw at any time without experiencing penalties or loss of access to services for their relative. Additionally, the researcher carefully observed the PWDs during the observations for any signs that indicated that they objected to participating in the study or that their integrity was being compromised. No such signs were observed. Although the PWDs could observe the videotaping equipment, they did not seem to be distracted by it.

Results

Resistiveness to care scale

The distribution of reported resistant behaviours defined for the RTCS, at different levels of duration during the baseline and the intervention, is shown in Table 1 and the mean seconds in Table 2. Pull away was the most common resistant behaviour observed both during baseline and during intervention. During baseline, 65% ($n = 26$) of the observations related to the PWDs pulling away compared with 47% ($n = 19$) during the intervention. Forty-five per cent (18/40) of the observations at baseline occurred for more than 16 seconds (score ≥2) compared to 7% (3/40) during the intervention, and none of the observations of pulling away prevailed for more than 59 seconds during the intervention (Table 1). During baseline, PWDs were observed with a longer duration of pulling away compared with PWDs during MTC intervention (148·8 vs. 49·3 seconds). These figures differ to a significant degree (Table 2).

In all, 44% (35/80) of observations were related to PWDs grabbing objects. During baseline, 52·5% of the observations occurred when a person grabbed objects. In comparison, 35% of PWDs grabbed objects during the MTC intervention (Table 1). As seen in Table 2, the mean for grabbing objects was significantly greater during baseline (81·3 seconds, SD 10·1) compared with the duration during the MTC intervention (32·7 SD 5·4).

For the behaviour adduction, the mean seconds were significantly lower, 30·8 seconds (SD 5·013), among PWDs during morning care with the intervention compared with morning care at baseline, 78·5 (SD 9·769), with no singing for or together with the patient with dementia.

A comparison of the scores for PWDs during baseline and PWDs during intervention (Table 1) showed that screaming was the only behaviour that occurred for more than two minutes. Fifty-five percentages of the observations included a PWD screaming during baseline compared to 32·5% during the intervention. The behaviour screaming decreased from 205·8 (SD 45·7) seconds during baseline to 104·5 (SD 30·5) during the MTC intervention. Furthermore, turn away, push away and threaten were the least common symptoms observed both during baseline and during intervention. None of the participants demonstrated these symptoms for more than 16 seconds during the observations of baseline or intervention.

Observed emotion rating scale

The distribution of reported expressed emotions from the OERS at different levels of severity during the baseline and the intervention is shown in Table 3 and the mean seconds in Table 4. For positively expressed emotions, pleasure and general alertness significantly increased during MTC intervention. The mean for pleasure occurred during baseline at 281·8 seconds (SD 37·002) compared to 1387·5 seconds (SD 151·948) during MTC intervention ($p > 0{\cdot}05$) (Table 4). Twenty per cent of the PWDs expressed pleasure for more than one minute during baseline compared with 50% during the MTC intervention (Table 3). General alertness occurred for 2010·2 seconds (SD 221·636) during baseline compared with 2703·3 seconds (SD 212·850) during MTC intervention ($p > 0{\cdot}05$) (Table 4). Almost half (47·5%) of the PWDs expressed general alertness for more than one minute during morning care without singing. For comparison, 72·5% of the

Table 1 Number (%) of observations per score level during morning care without and with music therapeutic caregiving

	Number (%) of observations per score level during morning care without singing					Number (%) of observations per score level during morning care with singing				
	None	< 16 seconds	16–59 seconds	1–2 minutes	> 2 minutes	No	< 16 seconds	16–59 seconds	1–2 minutes	> 2 minutes
Turn away	36 (90)	4 (10)	0	0	0	40 (100)	0	0	0	0
Pull away	14 (35)	8 (20)	17 (43)	1 (2)	0	21 (53)	16 (40)	3 (7)	0	0
Push away	37 (92·5)	3 (7·5)	0	0	0	35 (87·5)	5 (12·5)	0	0	0
Pull/push	25 (62·5)	7 (17·5)	8 (20)	0	0	27 (67·5)	11 (27·5)	2 (5)	0	0
Grab object	19 (47·5)	11 (27·5)	10 (25)	0	0	26 (65)	12 (30)	2 (5)	0	0
Grab person	21 (52·5)	7 (17·5)	9 (22·5)	3 (7·5)	0	24 (60)	8 (20)	8 (20)	0	0
Adduct	19 (47·5)	13 (32·5)	8 (20)	0	0	21 (52·5)	17 (42·5)	2 (5)	0	0
Hit/Kick	31 (77·5)	6 (15)	3 (7·5)	0	0	33 (82·5)	7 (17·5)	0	0	0
Say no	18 (45)	17 (42·5)	4 (10)	1 (2·5)	0	25 (62·5)	13 (32·5)	2 (5)	0	0
Cry	34 (85)	5 (12·5)	0	1 (2·5)	0	37 (92·5)	2 (5)	1 (2·5)	0	0
Threaten	37 (92·5)	3 (7·5)	0	0	0	38 (95)	2 (5)	0	0	0
Scream	18 (45)	12 (30)	7 (17·5)	1 (2·5)	2 (5)	26 (65)	11 (27·5)	1 (2·5)	1 (2·5)	1 (2·5)
Clench mouth	32 (80)	1 (2·5)	3 (7·5)	0	4 (10)	32 (80)	0	7 (17·5)	1 (2·5)	0

Table 2 Time (seconds) for resistiveness to care scale during baseline and music therapeutic caregiving intervention

	No singing			Singing				
	n	Mean	SD	*n*	Mean	SD	*p*	CI 95%
Turn away	10	4·0	0·852	10	0	0	0·172	−0·21 to 1·01
Pull away	10	148·8	15·480	10	49·3	6·929	0·013	2·70 to −17·20
Push away	10	18·0	5·692	10	10·3	2·907	0·407	−1·24 to −2·79
Push/pull	10	55·5	8·999	10	21·8	4·375	0·097	−0·75 to 7·50
Grab object	10	81·3	10·139	10	32·7	5·397	0·020	0·98 to 8·72
Grab person	10	142·5	25·612	10	64·3	10·820	0·180	−4·36 to 20·01
Adduct	10	78·5	9·769	10	30·8	5·013	0·037	0·35 to 9·20
Hit kick	10	20·0	5·397	10	9·3	2·309	0·308	−1·17 to 3·32
Say no	10	73·3	14·626	10	23·3	4·287	0·179	−2·76 to 12·76
Cry	10	32·5	7·878	10	14·8	3·606	0·221	−1·28 to 4·83
Threaten	10	2·5	0·635	10	1·5	4·743	0·168	−0·05 to 0·25
Scream	10	205·8	45·664	10	104·5	30·449	0·079	−1·44 to 21·69
Clench mouth	10	261·0	71·094	10	95·3	20·944	0·343	−20·9 to 54·07

Table 3 Number (%) of observations per score level during morning care without and with music therapeutic caregiving

	Number (%) of observations per score level during morning care without singing						Number (%) of observations per score level during morning care with singing				
	Not in view	Never	< 16 seconds	16–59 seconds	1–5 minutes	More than 5 minutes	Not in view	Never	< 16 seconds	16–59 seconds	1–5 minutes	More than 5 minutes
Pleasure	0	14 (35)	8 (20)	10 (25)	8 (20)	0	0	7 (17)	6 (15)	7 (18)	14 (35)	6 (15)
Anger	0	11 (27·5)	4 (10)	13 (32·5)	9 (22·5)	3 (7·5)	0	15 (37·5)	11 (27·5)	7 (17·5)	7 (17·5)	0
Anxiety/Fear	0	15 (37·5)	5 (12·5)	7 (17·5)	6 (15)	7 (17·5)	0	17 (42·5)	8 (20)	3 (7·5)	11 (27·5)	1 (2·5)
Sadness	0	30 (75)	4 (10)	3 (7·5)	2 (5)	1 (2·5)	0	34 (85)	1 (2·5)	3 (7·5)	2 (5)	0
Gen alert	0	1 (2·5)	10 (25)	10 (25)	4 (10)	15 (37·5)	0	0	4 (10)	7 (17·5)	11 (27·5)	18 (45)

Table 4 Time (seconds) for observed emotion rating scale during baseline and music therapeutic caregiving intervention

	No singing			Singing				
	n	Mean	SD	*n*	Mean	SD	*p*	CI 95%
Pleasure	10	281·8	37·022	10	1387·5	151·948	0·016	−194·75 to −26·40
Anger	10	776·0	108·828	10	308·3	41·363	0·078	−6·42 to 99·98
Anxiety/fear	10	1161·0	190·441	10	564·0	86·949	0·118	−18·55 to 137·95
Sadness	10	222·8	60·073	10	114·5	34·403	0·219	−7·70 to 29·35
General alertness	10	2010·2	221·636	10	2703·3	212·850	0·042	−135·67 to −2·93

PWDs were observed with general alertness during morning care when the caregivers sang with or together with the PWDs (Table 3).

Comparison of the negative emotions scores for PWDs during baseline and PWDs during intervention (Table 3) showed that anger for more than 16 seconds decreased from 25 of the 40 observations during baseline to 14 of the 40 observations during the MTC intervention; none of the PWDs expressed anger for more than five minutes during the MTC intervention. Anxiety/fear for more than 16 seconds occurred in 50% of the observations during baseline compared with 37·5% during the MTC intervention. Furthermore, sadness was the least common expression observed both during baseline and during intervention. Seventy-five per cent of the PWDs expressed no sadness during baseline compared with 85% during the MTC intervention.

Discussion

Methodological considerations

Videotaped observations proved to be a suitable method. Marshall and Rossman (2006) suggest that videotaping with audio offers rich information that often exceeds other kinds of data because of its ability to capture both verbal and non-verbal communication. Polit and Beck (2008) point out that when using this method for data collection, the researcher should keep in mind that the participants being recorded might change their behaviour in the knowledge that they are being observed. In this study, an attempt was made not to disturb the morning care during the video recordings. Using VIO, the researcher was able to capture close-range pictures of the PWDs to study their facial expressions, which were important for this study. Additionally, Latvala *et al.* (2000) state that the participants acclimate to the presence of the video camera and start to behave as if they are not being filmed. Because the PWDs had severe dementia, they did not have the capacity to alter their behaviour during the observations and they did not seem to notice the camera. We saw no signs that the participants were distracted by the videotaping; indeed, they seemed to forget that the camera was there. All the caregivers involved in the study had extensive experience in caring for the participating PWDs and had been working in dementia care from 2·5–30 years. The same caregiver and PWD (in all 10 pairs) participated during all baseline and intervention situations to minimise the risk that the PWDs would act differently because of different caregivers. The PWDs as well as the caregivers were native Swedish speakers, and the songs were sung in Swedish.

The study sample consisted of 10 PWDs who were video-observed 80 times in all. Only small variations were observed between the VIOs of each PWD during the usual care situation and the VIOs of each PWD during the intervention with MTC. This could be explained by the small sample, which could be a limitation in generalising the findings of this study. Further research about the effects of MTC should involve larger samples to allow generalisation. However, the results described in this study are valuable as this small sample revealed some significant results. One of the strengths of the study design was that the PWDs served as their own controls with four separate baseline and four separate intervention observations.

Discussion of the results

The aim of this study was to describe PWDs' expressions of resistiveness to care and expressions of emotions, while being cared for by their caregivers during morning care situations without and with MTC. The main findings were that PWDs' expressions of behaviours indicating resistiveness to care seemed to decrease, while their expressions of positive emotions seemed to increase during MTC in morning care situations involving PWDs and their caregivers. To our knowledge, this is the first quantitative study measuring the effects of MTC on PWDs during morning care situations.

During baseline, the observations of resistant behaviours revealed a higher mean number of seconds for all variables in

comparison with those for the intervention. However, for this small sample, a significant decrease during the intervention was observed for the three variables pull away, grab object and adduct. Resistance is a commonly expressed behaviour by PWDs during caregiving, and this along with other problematic behaviours expressed by PWDs has been a major focus of research concerning dementia care during the last decades (Buhr & White 2007, Chou *et al.* 1996, Rossby *et al.* 1992, Skovdahl *et al.* 2003). PWDs' resistant behaviours are an expression of objection, and during caregiving, this might result in an inability to perform caregiving without physical (Morgan *et al.* 2008) or pharmacological (Bains *et al.* 2007, Herrmann & Gauthier 2008) restraints. According to previous research, this is demanding for both PWDs and the caregivers trying to perform care (Lundstrom *et al.* 2007, Pulsford & Duxbury 2006).

During the MTC intervention, PWDs' scores for expressions of resistant behaviours were lower in mean number of seconds, with significant decreases observed for three variables. This indicated that MTC might be a way for PWDs to experience caring in a less problematic way because they express less resistance to it. Previous research about MTC (Götell *et al.* 2002) confirms the findings of this study as PWD's resistant behaviours seemed to decrease during morning care situations even in that study. Götell *et al.* (2000, 2002, 2003, 2009) further suggests that PWDs are more cooperative and participate more in the caregiving situation using MTC. Also studies in the field of music therapy and dementia report that resistant behaviours decrease, while engagement increases when PWDs play instruments, listen to music or sing and expressions of positive emotions increase (Berger *et al.* 2004, Clair *et al.* 2005, Gerdner 2005).

This study also revealed that PWDs' expressions of positive emotions increased significantly, while negatively expressed emotions decreased in mean number of seconds, but not to a significant degree during MTC. Lawton *et al.* (1996) state that because PWDs are unable to report their internal states, their expressions of emotions are important for understanding their likes and dislikes. The variable Pleasure included singing, whistling, smiling and laughing, and this increased significantly during MTC. This supports previous findings for MTC (Götell *et al.* 2009) that suggest that PWDs express positive emotions and moods during morning care situations with MTC as they sang along, smiled and laughed with the caregiver. Bigand *et al.* (2005) suggest that basic emotions, such as happiness, anger, fear and sadness, can be recognised in and induced by musical stimuli and further state that there is no doubt that emotion is at the core of musical experiences. Molnar-Szakacs and Overy (2006) state that music has the unique ability to trigger memories and that emotions are awakened through these memories. Music that we recognise spontaneously transports the mind back in time to memories and that is why different emotions might be evoked by it. Götell *et al.* (2009) along with music therapists such as Cuddy and Duffin (2005) and Ridder and Aldridge (2005) state that PWDs are able to remember song texts and sing songs and emotions are expressed through these.

The results of this study also revealed that PWDs' expressions of general alertness, which included participating in task, eye contact, looking around the room and responding, increased significantly during MTC. This finding could be discussed in the light of Götell *et al.* (2003, 2009) who suggest that MTC makes PWDs more engaged and interested in what is going on in the caring activity and evokes enhanced sensory awareness. Additionally, the results revealed that the mean seconds of negatively expressed emotions were lower for all variables during MTC compared with the baseline, though not to a significant degree. This could once again be discussed with Götell *et al.* (2002, 2003, 2009) who suggest that PWDs' expressions of aggression and resistant and screaming behaviours are abated during MTC.

More research is needed to evaluate the feasibility of MTC as a care intervention in the family of non-pharmacological treatments, including whether it is a useful intervention in dementia care. The results of this study along with other research about MTC (Götell *et al.* 2000, 2002, 2003, 2009) consistently indicate that MTC could provide a means to abate resistance and negative expressed emotions while evoking an increase in positive emotions. PWDs suffer from cognitive impairment, making caregiving tasks problematic to accomplish, and according to Boykin and Schoenhofer (1993) and Watson (2008), caring can only be effectively demonstrated through the interpersonal relationship between nurse and patient. Watson (2008) further states that this relationship should involve effective communication characterised by give and take. We suggest that MTC could be a way to facilitate this caring relationship because it offers a greater chance for PWDs to express themselves through emotions and actions and, as previous research reveals, through enhanced verbal communication, a potentially important component when one aims to facilitate a caring encounter and cooperation between PWDs and their caregivers.

Conclusion

MTC might be an effective nursing intervention for PWD, as the subjects of this study seemed to experience morning care situations as less uncomfortable and perhaps more joyful as evidenced by a decrease in resistant behaviour and an

increase in positive emotions. More research is needed to explore the possible effects of MTC.

Relevance to clinical practice

MTC is unique because it is implemented during care situations in which PWDs and their caregivers interact. Moreover, it is easy to implement in the context of nursing care directed to personal needs, as in morning care situations. We suggest that education should include training on how to use singing as a tool for caregivers to interact with PWDs during caregiving. MTC demonstrates an advantage over other kinds of music intervention because it requires no special equipment other than the singing voice. MTC can be individualised to accommodate an individual resident's preferences, which might encourage the PWD to join the singing, hum along or whistle, becoming an active participant instead of a passive listener. Singing is also widely enjoyed as a means of expression across all cultures and geographical regions, which makes MTC a method that can be implemented globally.

Acknowledgements

We thank the caregivers and the PWDs that participated in this study. Thanks also to Ms. Caroline Sutton for the linguistic revision.

The study was financed by a grant from Sparbanksstiftelsen Nya, Johanniterorden in Sweden, the City of Västerås, Demensförbundet, and Mälardalen University and was supported by the College of Nursing at Seattle University, USA, and Department of Neurobiology, Care Science, and Society, Division of Nursing, Karolinska Institute, Sweden.

Contributions

Study design: LMH, AE, GE, EG; data collection: LMH; data analysis: LMH, AE, GE, EG and manuscript preparation: LMH, AE, GE, EG.

Conflict of interest

None.

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