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Evaluation of the implementation of the Meeting Centres Support Program in Italy, Poland and the UK; exploration of the effects on people with dementia

Authors:
Dawn Brooker, Simon Evans, Shirley Evans, Jennifer Bray, Francesca Lea Saibene, Claudia Scorolli, Dorota Szcześniak, Alessia D'Arma, Katarzyna M Urbańska, Teresa Atkinson, Elisabetta Farina, Joanna Rymaszewska, Rabih Chattat, Cate Henderson, Amritpal Rehill, Iris Hendriks, Franka Meiland, Rose-Marie Dröes

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Address for correspondence: Professor Dawn Brooker, Association for Dementia Studies, St John's Campus, University of Worcester, Worcester, WR2 6AJ Tel 01905 855250

email **d.brooker@worc.ac.uk**

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ABSTRACT

Objectives MEETINGDEM investigated whether the Dutch Meeting Centres Support Programme (MCSP) could be implemented in Italy, Poland and the UK with comparable benefits. This paper reports on the impact on people living with dementia attending pilot Meeting Centres in the three countries.

Methods Nine pilot Meeting Centres (MCs) participated (Italy-5, Poland-2, UK-2). Effectiveness of MCSP was compared to usual care (UC) on outcomes measuring behavioural and psychological symptoms (NPI), depression (CSDD) and quality of life (DQoL, QOL-AD), analysed by ANCOVAs in a 6 month pre-test/post-test controlled trial.

Results Pre/post data were collected for 85 people with dementia and 93 carers (MCSP) and 74 people with dementia /carer dyads' receiving UC. MCSP showed significant positive effects for DQoL [Self-esteem ($F=4.8$, $p=0.03$); Positive Affect ($F=14.93$, $p<0.00$); Feelings of Belonging ($F=7.77$, $p=0.01$)] with medium and large effect sizes. Higher attendance levels correlated with greater neuropsychiatric symptom reduction ($rho=0.24$, $p=0.03$) and a greater increase in feelings of support ($rho=0.36$, $p=0.001$).

Conclusions MCSPs showed significant wellbeing and health benefits compared to UC, building on the evidence of effectiveness from the Netherlands. In addition to the previously reported successful implementation of MCSP in Italy, Poland and the UK, these findings suggest that further international dissemination of MCSP is recommended.

INTRODUCTION

Many national dementia strategies recommend early diagnosis of dementia. Relatively few interventions focus on supporting both the person diagnosed with dementia and their family carer, whereas evidence suggests that combined interventions are more beneficial (Olazaran et al., 2010 Smits et al., 2007; Van 't Leven, 2013). The Meeting Centres Support Programme (MCSP) is a way of providing accessible support on a local level that focuses on both the person living with dementia and their family, providing accessible early support on a local level to meet the needs of people in the post-diagnostic stage. MCSP was developed, in collaboration with people with dementia and carers, following a community needs assessment in the Netherlands 25 years ago (Dröes et al., 2004a,b). Typically MCSP serves a local community of around 5,000 older people. The Meeting Centre (MC) "club" is offered 3 days per week, supporting 10-15 people plus families per day in easily accessible community locations. Evidence-based post-diagnostic psychosocial interventions are provided in a friendly manner, tailored to the needs of members. This is facilitated by a small team of staff and volunteers trained in the ethos of person centred dementia care, informed by the Adaptation-Coping Model (Dröes et al., 2010; Brooker et al., 2017). Family carers get practical information, advice, peer support, emotional support and social contact. The local focus fosters effective collaboration between care organisations, thus counteracting the fragmentation of care.

In two Dutch multi-centre effect studies comparing people attending MCs with those attending regular day care, people utilising MCs displayed fewer behaviour problems, in particular less non-social behaviour and inactive behaviour, after seven months (Dröes et al., 2000, 2004a). Furthermore, there was a positive effect on depressive behaviour and self-esteem for people with

dementia and also benefits for family carers (Dröes et al., 2004b, 2006). Research in the Netherlands identified various factors that promoted successful implementation of MCSP (Meiland et al., 2004, 2005). An implementation guide, publications, films and a training course for staff assisted organisations to set up MCSPs supported by a national helpdesk. As a result MCSPs have spread across the country with more than 140 Meeting Centres in the Netherlands supporting 3,750 people and their carers annually.

This paper reports on the JPND project MEETINGDEM (Dröes et al., 2017a) that aimed to transfer MCSP to Italy, Poland and the UK; to investigate whether adaptations were needed to support successful implementation in these countries and to evaluate if comparable benefits could be achieved. The adaptive implementation involved translating MCSP concepts and practicalities into a new country context. After exploring pathways to care (Szcześniak et al, in press), pilot Meeting Centres were successfully implemented in all countries in 2015 following a 12-month period of collaborative community engagement and adaptation (Mangiaracina et al., 2017). Within each participating country, a national project team conducted a standardised implementation study and assessed the impacts on people living with dementia and their family carers to ascertain if the results were comparable with those found in the Netherlands. Participants reported high levels of satisfaction with the support provided (Szcześniak et al., submitted). In this paper we focus on the impact of MCSP on social, behavioural and emotional functioning of people living with dementia. A separate paper details the impact on family carer outcomes measures (Evans et al., submitted).

METHOD

Design

As with the original Dutch study, a pre/post-test control group design was used comparing outcomes for people with dementia and family carers attending the MCSP with a Usual Care (UC) control group on several outcome measures. Measures were taken at pre-test and again after 6 months. Taking into account attrition of 15% over this period it was determined that 75 persons with dementia/family carer dyads should be recruited to each arm (Total 150; 25 per arm in each of the 3 countries). This number was based on previous effect studies into MCSP, in which moderate to large effects were found, and a power calculation: to demonstrate moderate effects (d=0.5), with a power of 0.80 and alpha 0.05. Changes over time that may have impacted on the outcomes *(*illness, physical disability, significant medication changes and the use of other types of support) were monitored along with reasons for drop-out. The research underwent successful ethical review in the separate countries.

Participants

The main target group were people with mild to moderately severe dementia, living at home and having a carer. There were no exclusions on age or type of dementia.

Meeting Centres Support Programme Intervention

Pilot MCs were successfully provided in specific geographic local communities in all three countries during 2015-16. This included five MC's in Italy (Lombardia and Emilia-Romagna regions), two in Poland (Wroclaw region) and two in the UK (Central England). It was not possible to explore the impact of all regions and jurisdictions within the countries. Materials and concepts developed in the Netherlands were translated. Compliance with the original MCSP

model was maintained to a high degree, although several country adaptations were made (Szcześniak et al., in press). The MC "club" was offered 3 days per week in the UK and Poland and 1.5 - 2 days per week in Italy. 10-15 dyads were supported per day. Participants for the MCSP group were recruited from people with dementia planning to attend the MC at least 1 day per week.

Usual Care

UC participants were recruited from a cohort group on a similar part of the dementia pathway within the same locality but outside the MC catchment area.

Measures

Background information on age, education level and gender was collected for all participants alongside information on individual factors (comorbidities, physical disability, psychotropic drug use, life events and use of services) that may have influenced outcomes. The Global Deterioration Scale [GDS] (Reisberg, 1987) was used to determine severity of dementia, the EQ-5D (mobility) as an indication for physical disability. Three of the standardised measures which were utilised in the original Dutch effects study were used in the current study to assist with comparison. The DQoL (Brod et al., 1999) is a 30-item interview used with the persons with mild to moderate dementia to assess the impact on quality of life, consisting of five subscales showing good internal consistency and test–retest reliability. All subscales are scored so that a higher score indicates a better quality of life. The Cornell Scale for Depression in Dementia [CSDD] (Alexopoulos et al., 1988) is a 19-item rating scale for assessing symptoms of depression in persons with dementia, observed in the week prior to the assessment. The

Neuropsychiatric Inventory [NPI-Q] (Cummings et al., 1994, 1997; Kaufer et al, 2000) assesses dementia-related behavioural, mood and psychiatric symptoms alongside symptom severity and caregiver distress The 13-item structured interview QOL-AD (Logsdon et al., 2002) was included as it suitable for people with more advanced dementia (Hoe et al., 2005). The Duke Social Support Inventory [DSSI] (George et al., 1989) was used to assess feelings of social support.

Polish versions of the NPI-Q (Bidzan & Bidzan, 2005) and the GDS (Barcikowska, 2011) were used. Italian versions of the NPI-Q (Binetti et al, 1998) and the QOL-AD (Bianchetti et al, 2017) were used. An Italian version of the GDS was utilized. All Italian and Polish measures for which no translation was available were translated and adapted according to WHO formal criteria for questionnaires (WHO, 2017). Back translation of the Polish versions of the DQoL, CSDD, QOL-AD and DSSI and back translations of the Italian versions of the DQoL, CSDD and DSSI were undertaken to ensure fidelity.

Procedures

A strong project management focus was employed throughout to ensure fidelity of the intervention to the original Dutch model and to maximise standardisation of research procedures across the different countries. All MCSP members were invited to participate in the research by the MC Manager within the first two weeks of attendance. Participation was entirely voluntary. For ethical and pragmatic reasons it was not possible to undertake baseline measures prior to MC attendance. The DQoL, QOL-AD and DSSI were administered by researchers during an interview with the person with dementia. The NPI-Q was completed by the family carers. The GDS and CSDD were completed by the MC Managers through interviews with the person with

dementia and the family carer. MC managers received training from the research team to do this. Participants who dropped out of the MC or UC before post-test data collection were not included in the effect evaluation. For the UC group, all measures were administered by researchers in participants' own homes and the GDS and CSDD completed by a professional who knew the person. Follow-up data were collected using the same measures six months after the baseline data collection point.

Data Analysis

The aim of the analysis was to explore whether similar effects were found for these adaptively implemented Meeting Centres as had been found within the original Dutch effect study (Dröes et al., 2004). The current trial was exploratory in nature, being conducted during the cross country implementation study. Given the exploratory nature of the trial, and consequently the relatively small sample per country, a decision was made to run the same analyses as in the Netherlands and thus to do separate ANCOVA's with a p-value of 0.05 and to not apply a Bonferroni correction on each test because of multiple testing. This enabled us to make more direct comparisons with the original Dutch research and to evaluate the feasibility of MCSP in other European countries. Following a similar process to that adopted in the Dutch study (Dröes et al., 2004) the baseline characteristics of the participants in the MCSP and UC groups were analysed descriptively with differences between the groups being tested (two-sided, alpha 0.05) by t-tests (for ordinal and interval data that were normally distributed) and Chi2 tests (for nominal data). ANCOVA's and t-tests were used on the outcome measures data that had normal distribution. t-tests and Chi2 tests were undertaken to assess whether the MCSP intervention and UC control groups differed at baseline on characteristics such as gender, age and degree of dementia.

Characteristics that differed significantly between MCSP and UC at baseline and correlated with one or more outcome measure (potential confounding variables) were included as covariates in the analysis. The outcome measures data were analysed by covariance analyses (ANCOVAs) on the post-test measurements, while including baseline measurements as covariates. The data overall (all countries) were combined to assess differences between the MCSP and UC groups. Although the study was not sufficiently powered to fully test differences per country and between countries, we explored the differences between MCSP and UC groups at a country level (within the countries).

The ANCOVA analysis was conducted using the statistical package SPSS Version 23, where the options were selected to report the adjusted means and effect size in each case. Cohen's d effect sizes (Cohen, 1988) were calculated for each ANCOVA. By using records of medication use, illness/significant life events in the weeks before the post test, and use of other support services, it was assessed as to whether these had influenced outcomes on a group basis. Spearman's rank correlation between the outcome measures and attendance levels were calculated to further explore the effect of attendance on changes in outcomes for the MCSP group.

RESULTS

Numbers Recruited to Research: The numbers originally recruited, data collected at pre-test and post-test by country are shown in **Figure 1**. Between pre-test and post-test measures there was attrition of 27% in the MCSP group and 18% in the UC group. Those who dropped out tended to be slightly older and have more severe dementia. There were no significant characteristic differences in attrition between MCSP and UC groups. Data analysis was based on completed measures from 85 people with dementia attending the MC across Italy, Poland and the UK, and 74 people with dementia receiving UC.

Recruitment to the MCSP group was through the Meeting Centres in the respective countries. Recruitment to the UC group was through health or welfare organisations (UK 3/41; Italy 15/25; Poland 17/24) or through GP's (UK 0/41; Italy 0/25; Poland 4/24) or through non-governmental/charitable support services (UK 31/41; Italy 10/25; Poland 1/24) or other contacts (UK7/41; Italy 0/25; Poland 2/24).

----- ---**Insert FIGURE 1 about here** ----------

Participant Characteristics: There were no significant differences between the participant characteristics (**Table 1**).

---------- **Insert table 1 here** ----------

Comparison of outcome measures for MCSP and UC: ANCOVA's were performed on all outcome measures overall and per country (**Table 2).** Severity of Dementia according to the GDS was included as an additional fixed factor within the analysis.

----- ---**Insert Table 2 about here** ----------

Quality of Life: The ANCOVA results indicate that compared to the UC group, the MCSP group benefitted most on quality of life (DQoL). Significant differences were recorded on the domains self-esteem, positive affect and feelings of belonging, with medium to large effect sizes. There was a clear pattern within the DQoL scores either remaining stable or improving for the MCSP group over time whereas the pattern was much more mixed in the UC group. The ANCOVA did not show a statistically significant difference between the scores for the MCSP and UC groups on the QOL-AD.

Depression: The ANCOVA did not show a significant difference between MCSP and UC for the CSDD.

Neuropsychiatric Symptoms: The ANCOVA did not show a significant difference between MCSP and UC at post-test. There were some differences in the changes in types of symptoms reported by the two groups **(Table 3).** Whilst these cannot be taken as evidence of effect of the intervention they are of interest in that they provide a picture of the prevalence of these symptoms in both groups and the change in 6 months.

----- ---**Insert Table 3 about here** ----------

Feeling of Support: No significant difference between MC and UC groups was found for any of the sub-domains of the DSSI.

MC Attendance: How people utilised MCSP varied with some people utilising MCSP at every opportunity whereas others were infrequent users. The mean number of days' attendance over 6-months is shown in **Table 4** overall and by countries. Secondary analysis using Spearman's rank correlation between frequency of attendance and the changes in outcome measures demonstrated a significant correlation between higher attendance and more positive changes in symptom severity on the NPI (rho=0.24, p=0.03). There was also a significant correlation between higher attendance and a greater change in Duke SSI sub-domain of feelings of support (rho=0.36, p=0.001).

---------- **insert table 4 here** ----------

Country Differences: Italy had the highest attrition rate (36% between pre/post-test compared to 21% in Poland and 17% in UK). The attrition in the original Dutch study was 21%. Participants in the UK MCSP and UC groups were more than twice as likely to be male (63% and 64% respectively) than in Italy and Poland where men only accounted for around 32% of study participants. The average age was similar across all countries (around 78 years).

The severity of dementia was quantified by GDS score, with the expectation that most participants (and thus all research participants) would be GDS stage 4-5. The reality was quite different and varied across countries (**Table 5**) with a substantial proportion of participants having relatively mild cognitive problems but also some with severe dementia. The UK had the widest spread of 11% showing very mild decline and 14% in the severe stages.

----- ---**Insert Table 5 about here** ----------

On average, UK MCSP participants attended about half the number of days (mean = 34.7 days, SD 15.7) as their Polish counterparts (mean = 63.7 days, SD 18.7) and a third less than in Italy (mean = 48.1 days, SD 20.9) although individual variation was great in all countries. Country specific ANCOVAs (Table 2) showed a number of effects on Quality of life between the MCSP and UC groups in Italy, Poland and the UK: Italy achieved large statistically significant effects on the DQoL sub-domains of Positive Affect (d=1.01) and overall Quality of Life (d=1.0), and a medium effect on Feelings of Belonging (d=0.57). They also achieved a statistically significant medium effect on the QOL-AD (d=0.74). In Poland the MCSP group rated their overall Quality of life at post-test as lower than the UC group (d=0.83), but compared to pre-test their quality of life did not change. In the UK the MCSP group showed more Positive Affect (d=0.68) at post-test than the UC group (medium effect), and a large significant improvement on Negative Affect (d=0.99). The UK UC group rated their overall Quality of Life as better (d=1.04) than the MC group at post-test. The ANCOVAs did not show statistical significant effects on CSDD or NPI on a country level, but there were medium effect sizes for Italy regarding improvements in the CSDD and DSSI Satisfaction and Support.

A check on longitudinal changes in possible influencing factors (illness, psychotropic drugs etc) between pre and post-test within and between groups, and life events within one month before the post test, did not reveal differences between groups that would have explained the effects found.

DISCUSSION

This research shows that it is possible to adaptively implement the Dutch MCSP model in three very different European countries and that the impact on people living with dementia is broadly comparable to earlier research (Dröes et al., 2000, 2004). As well as small to medium positive effects on Self-esteem the current study also found medium to large effects in Positive Affect and a medium effect on Feelings of Belonging. The effect on depressed behaviour was not replicated. The original Dutch research reported significant decreases in non-social and inactive behaviour in the MCSP group. In comparison with these findings the NPI data in the current study did not change significantly overall although there were some reductions reported for agitated and aggressive behaviour. Apathy increased in both groups but to a greater extent in the UC group. The significant correlation between higher number of attendances and a greater decrease in neuropsychiatric symptoms and greater feelings of support is of interest. A causal link cannot be attributed to this finding. It may be that those with increased severity of symptoms attended less, perhaps because their symptoms were disruptive or led to difficulties in them attending. Further study of this relationship may be useful in understanding the impact of attendance on neuropsychiatric symptom management.

Our study was primarily focused on the adaptive implementation and validation of the MCSP model. As a consequence, no detailed screening on type of dementia or cognitive impairments

was performed or taken into account in the analyses, although we corrected for between group differences in severity of dementia. In the current study, MCSP participants had more severe levels of dementia generally than the Dutch sample (Dröes et al.,2004). Also in the Dröes et al. (2004) study those in the UC group generally had more severe dementia than those in the MCSP group, whereas the opposite was true in the current study. Within the original Dutch research the UC group consisted of participants of Psychogeriatric Day Care units within Nursing homes. This may have impacted on fewer reports of apathy, inactivity and depressive symptoms in the UC group in the current study.

Attendance patterns for MC's were different across countries. Likewise, the usual care comparison was not the same in each country. There appeared to be an overall correlation between attendance to MCSP and neuropsychiatric symptoms and feelings of being supported. The question of whether higher levels of attendance might explain some of the differences in outcomes in the different countries is a possibility. It may also have been that positive outcomes may have been seen if the MC's had just focussed on participants with more similar levels of dementia such as the GDS 4/5. The Meeting Centres were established over a relatively short period of time and it may have taken a greater amount of time for the model to bed into the new countries. All these issues may have diluted the effect. The study was not sufficiently powered to test this by within country analysis.

This was an exploratory study of a complex intervention in three countries that required significant commitment from people to participate. The attrition rate of 27% in the MC group was quite high compared to other psycho-social interventions. In the original multicentre study in the Netherlands attrition was 20% between pre and post-test. This lower attrition might also be because the Dutch sample had less severe dementia.

The study had a number of limitations in evaluating the impact of the intervention on people living with dementia. Allocation to the intervention was not random. In order to recruit enough participants to the intervention group it was necessary to compare to a geographical control group where there was not a Meeting Centre. Assessors were not blind to the intervention that participants received. Baseline measurements took place up to one month after commencing at the MC. Only participants that completed six months of attendance were included in the analyses. The analysis also undertook numerous tests of significance and multiple comparisons. However, the current study was designed primarily as an implementation study where much of the time and energy was put in realising at least two Meeting Centres in each country who provided the full MCSP (Mangiaracina et al., 2017; Szcześniak et al, in press), were piloted and evaluated. Consequently larger samples with blind assessment were not possible in this study. For a thorough effect study per country separate larger sized RCT's would be required.

Despite these challenges, a successful intervention from one country into three others was replicated and found significant benefits. This study demonstrated that cross-country and multicentre evaluations of psychosocial interventions are feasible. Specifically this study suggests that the MCSP model can be successfully implemented in countries with very different health and social care systems. This should encourage other countries to implement this model with country specific adaptation. There was variance both within but also between countries in patterns of attendance in the different countries, which may have diluted the effect of the impact of the intervention on a group level and as a consequence decreased some of the overall benefits. The results of our study are in line with the literature on interventions supporting community dwelling people to live with dementia and to improve their social participation, thus aiming to

improve their social health and quality of life (Dröes et al., 2017b). Examples are: home community occupational therapy (Gitlin et al., 2003; Graff et al., 2007); the Enriched Opportunities Programme (Brooker et al., 2011); intergenerational programmes (Park, 2014); and easy access day treatment centres for people with dementia with carer support (Van Haeften-Van Dijk et al., 2016). This current study is part of the emerging research into psychosocial interventions that report on positive outcomes rather than just reporting on the reduction of negative symptoms (Wolverson et al., 2016). It also shows the strength of combining interventions for people living with dementia and caregivers to bring about clinically relevant improvements in well-being.

CONCLUSION

This study answered two main questions: Does the successful MCSP model developed in the Netherlands work in other European countries, more specifically in Italy, Poland and the UK, and are comparable benefits achieved for people with dementia and their carers in these countries? The study showed this to be the case, the implementation proved successful in all three countries and the benefits were partially replicated. Further dissemination of MCSP is therefore recommended within the countries involved in the study, but also in other European countries and beyond. There is a great need for high quality implementation research to demonstrate how care interventions can be put into practice in a variety of settings and how evidence based practices can be effectively disseminated and transferred to other countries to share knowledge and improve dementia care on a European and world wide level. Demonstrating that outcomes of effective interventions in one country can be replicated in other countries is therefore very important.

KEY POINTS

1. The Meeting Centres Support Programme (MCSP) was developed in the Netherlands 25 years ago to provide local community support both to people living with dementia and their family carers. It has proven benefits and now supports nearly 4000 people per year across the Netherlands.
2. Meeting Centres were successfully implemented in Italy, Poland and the UK utilising the Dutch model and adapting MCSP to country specific needs and contexts
3. After 7 months attending the Meeting Centres people living with dementia reported significant improvements in self-esteem, positive affect and feelings of belonging. Higher levels of attendance were correlated with a greater reduction in distressing behaviour symptoms and greater feelings of support.
4. The MCSP is transferable across different countries and shows benefits for people living with dementia at home.

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Ethical Approval

The study received ethical approval in 3 countries

UK - Health Research Authority (specifically Wales Research Ethics Committee approved Validation of the Meeting Centres Support Programme for people with dementia and their carers in UK, REC reference: 15/WA/0232: IRAS project ID: 176743

Poland - Bioethical Committee of Wroclaw Medical University in Poland acceptance no. KB-219/2015.**Italy –** Ethical committee of the IRCCS Don Gnocchi Foundation, Lombardia Region, Italy acceptance no. 6/18022015

The number of the VU University medical center Ethics committee decision letter confirming 'MeetingDem as being 'non-medical research' is 2013/370.

FIGURE 1 Numbers of Research Participants with dementia recruited in Meeting Centres Support group and Usual Care Group by country and completing assessments at each stage

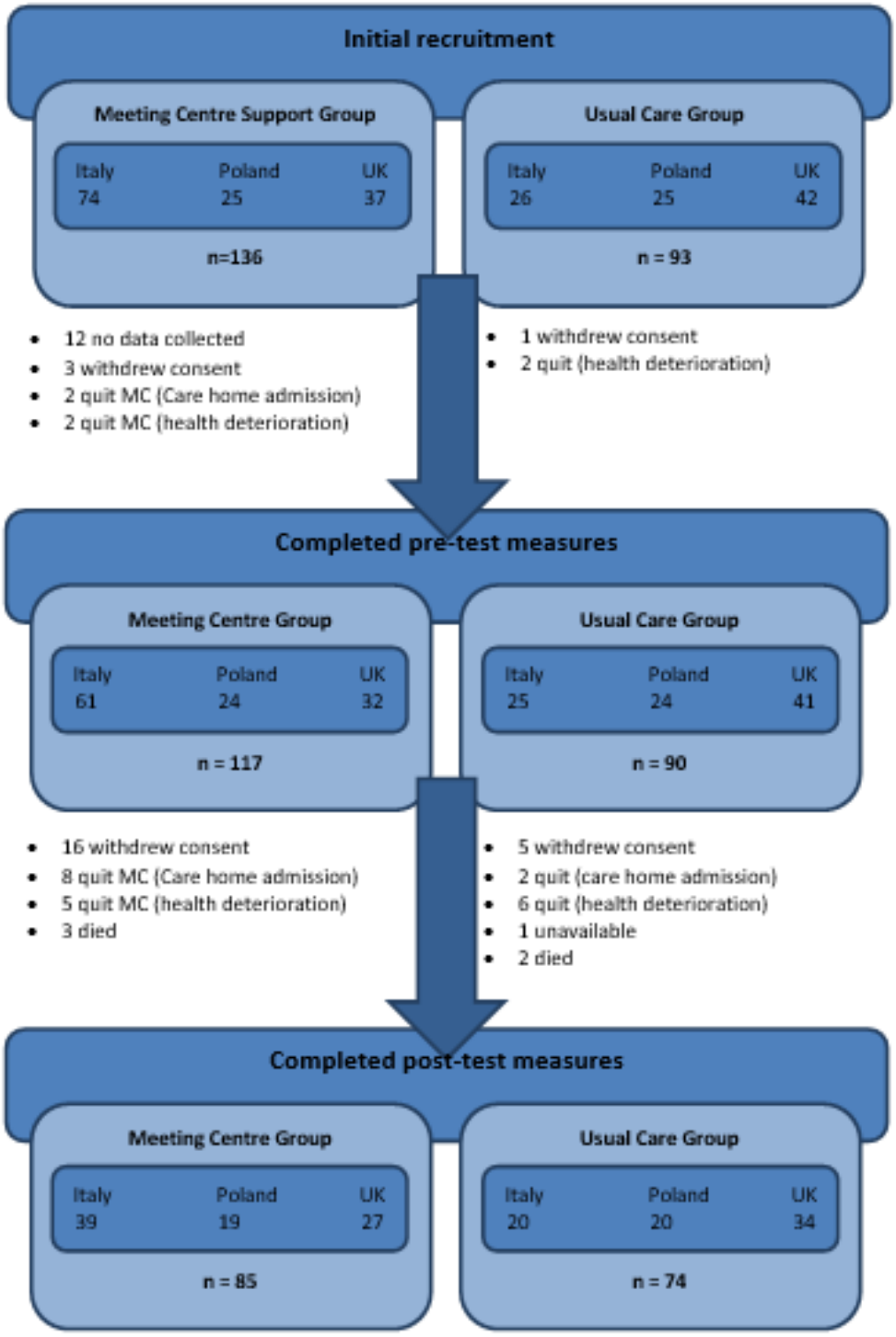

Table 1 Data on persons with dementia using the Meeting Centres Support Programme (MCSP) and receiving Usual Care (UC)

		MCSP group (n=85)	UC group (n=74)	Test statistic	p (two-sided)
Sex	Male	36 (42.4%)	34 (45.9%)	$\chi^2 = 0.21$	0.65
	Female	49 (57.6%)	40 (54.1%)		
Age	Mean age (Standard Deviation) Range	78.4 (7.8) 63-93	78.5 (7.3) 62-95	t = 1.98	0.94
	<60	-	-	$\chi^2 = 4.20$	0.12
	60-69	15 (18.1%)	7 (9.6%)		
	70-79	27 (32.5%)	34 (46.6%)		
	80+	41 (49.4%)	32 (43.8%)		
Civil status	Married/co-habiting/ civil partnership	48 (56.5%)	48 (66.7%)	$\chi^2 = 1.71$	0.19
	Widowed/divorced/ single	37 (43.5%)	24 (33.3%)		
Severity of dementia (GDS score)	Mean Score (standard deviation)	4.0 (1.1)	3.7 (1.1)	t=1.98	0.11
	Median Score (Range)	4 (2-7)	4 (1-6)		
Primary care giver	Spouse/partner	45 (52.9%)	43 (58.1%)	$\chi^2 = 3.14$	0.21
	Daughter/son	30 (35.3%)	28 (37.8%)		
	Other	10 (11.8%)	3 (4.1%)		

Table 2: Outcome measures and results of ANCOVAs using pre-test and post-test means for Meeting Centre Support Programme (MCSP) and Usual Care (UC) groups.

Measure (numbers in MCSP/UC)			Pre-test		Post-test		Post-test ANCOVA adjusted MC/UC mean	F	P	Effect size d
			MCSP mean (SD)	UC mean (SD)	MCSP mean (SD)	UC mean (SD)				
D-QOL sub domains (range of scores)	**Sense of Aesthetics (5-25)**	**Overall (n=82/69)**	18.3 (3.6)	17.7 (5.1)	19.4 (3.8)	18.6 (5.2)	18.8/18.3	0.56	0.46	0.13
		Italy (n=37/20)	18.3 (3.7)	16.4 (4.5)	19.8 (4.1)	17.1 (4.6)	20.5/18.8	2.19	0.15	0.41
		Poland (n=19/18)	18.1 (3.3)	18.3 (4.5)	19.0 (3.1)	18.6 (3.6)	19.1/18.5	0.35	0.56	0.20
		UK (n=26/31)	18.6 (4.0)	18.3 (5.8)	19.1 (4.0)	19.6 (6.3)	18.5/18.6	0.03	0.87	0.06
	Self-esteem (4-20)	**Overall (n=78/65)**	13.5 (3.4)	13.4 (2.8)	14.3 (3.1)	13.1 (3.7)	14.2/13.1	4.80	0.03*	0.38
		Italy (n=35/20)	14.5 (3.3)	13.0 (2.3)	15.4 (2.8)	13.3 (2.6)	15.4/13.8	3.76	0.06	0.55
		Poland (n=19/18)	12.5 (3.3)	13.5 (2.9)	13.6 (2.7)	14.1 (3.7)	13.9/13.7	0.07 [0.17]	0.80# [0.69]	0.09 0.14
		UK (n=24/27)	12.9 (3.3)	13.7 (3.1)	13.1 (3.3)	12.4 (4.3)	13.4/11.8	2.39	0.13	0.45
	Positive affect (6-30)	**Overall (n=80/67)**	20.5 (4.4)	22.0 (4.9)	21.9 (4.3)	20.6 (3.9)	22.0/19.9	14.93	0.00*	0.65
		Italy (n=37/20)	20.6 (4.7)	22.2 (3.8)	22.7 (4.0)	20.1 (3.9)	23.1/19.4	13.24	0.001*	1.01
		Poland (n=19/18)	18.7 (4.6)	20.2 (5.5)	19.7 (4.4)	20.5 (3.6)	20.2/20.1	0.01	0.92	0.00
		UK (n=24/29)	21.7 (3.5)	22.9 (5.1)	22.3 (4.2)	21.0 (4.2)	22.4/20.1	5.50	0.02*	0.68
	Negative affect (11-55)	**Overall (n=79/67)**	27.5 (8.0)	27.1 (8.2)	26.3 (7.6)	25.2 (8.5)	25.8/25.0	1.00	0.32	0.17
		Italy (n=37/20)	25.8 (7.9)	28.5 (7.4)	23.7 (7.5)	27.3 (8.3)	24.7/25.4	0.40	0.53	0.18
		Poland (n=19/18)	31.4 (7.4)	30.9 (7.1)	27.8 (6.9)	28.5 (6.8)	27.6/28.6	0.52	0.48	0.26
		UK (n=23/29)	27.2 (8.0)	23.8 (8.4)	29.3 (7.0)	21.8 (8.7)	27.2/21.9	11.57	0.001*	0.99
	Feelings of belonging (3-15)	**Overall (n=79/63)**	10.7 (2.5)	11.2 (2.4)	11.5 (2.5)	10.5 (3.1)	11.5/10.3	7.77	0.01*	0.48
		Italy (n=37/20)	11.3 (2.3)	10.7 (2.8)	12.2 (2.2)	10.7 (2.4)	12.8/11.5	4.16	0.05*	0.57
		Poland (n=19/18)	9.7 (2.7)	10.9 (2.1)	11.2 (2.5)	11.8 (2.2)	11.5/11.4	0.03	0.87	0.06
		UK (n=23/25)	10.4 (2.6)	11.8 (2.1)	10.4 (2.8)	9.4 (3.8)	10.4/8.6	3.77	0.06	0.59
	Overall quality of life (1-5)	**Overall (n=81/69)**	3.3 (0.8)	3.6 (1.0)	3.3 (0.8)	3.6 (1.0)	3.1/3.4	2.95 [2.33]	0.09# [0.13]	0.29 [0.26]
		Italy (n=36/20)	3.5 (0.9)	3.4 (1.1)	3.5 (0.8)	2.8 (0.6)	3.4/2.6	12.74	0.001*	1.00
		Poland (n=19/18)	3.1 (0.4)	3.8 (1.0)	3.1 (0.4)	3.6 (0.8)	3.1/3.6	5.56 [5.62]	0.02*# [0.02*]	0.82 0.83

		UK (n=26/31)	3.3 (0.9)	3.6 (1.1)	3.2 (0.9)	4.2 (1.0)	3.1/3.9	14.04	0.00*	1.04
QOL-AD (range 4-52)		**Overall (n=81/67)**	34.8 (5.3)	35.3 (5.1)	35.4 (5.1)	34.6 (5.6)	35.4/34.4	2.24	0.14	0.25
		Italy (n=37/19)	34.4 (5.5)	32.6 (4.2)	35.0 (5.0)	30.5 (5.8)	35.2/31.7	6.91	0.01*	0.74
		Poland (n=19/18)	34.3 (5.2)	37.6 (4.2)	36.3 (5.0)	38.1 (4.4)	37.5/37.1	0.12	0.74	0.13
		UK (n=25/30)	35.8 (5.2)	35.7 (5.5)	35.3 (5.3)	35.2 (4.3)	34.8/34.6	0.04	0.85	0.06
Cornell Scale Depression (range 0-38)		**Overall (n=80/63)**	8.3 (5.6)	6.3 (4.7)	7.8 (5.6)	6.8 (6.1)	6.9/7.3	0.30	0.58	0.09
		Italy (n=35/16)	6.3 (4.2)	3.8 (2.9)	5.3 (3.5)	5.0 (5.0)	4.3/5.8	1.99	0.17	0.41
		Poland (n=19/18)	10.2 (6.1)	7.6 (4.8)	9.4 (6.2)	9.8 (5.5)	8.5/10.5	1.71	0.20	0.45
		UK (n=26/29)	9.5 (6.3)	6.9 (5.1)	10.2 (6.3)	5.9 (6.6)	8.8/6.4	2.93	0.09	0.48
NPI	**Severity (range 0-36)**	**Overall (n=91/72)**	9.5 (5.6)	7.8 (5.7)	9.4 (5.6)	8.3 (6.1)	8.9/8.9	0.001	0.98	0.00
		Italy (n=42/21)	10.8 (6.1)	9.0 (5.5)	10.5 (5.5)	10.2 (4.6)	11.8/11.8	0.01	0.95	0.00
		Poland (n=21/19)	7.2 (3.7)	8.0 (5.5)	6.3 (4.6)	7.8 (6.1)	5.3/6.6	0.63	0.43	0.27
		UK (n=28/32)	9.4 (5.7)	6.8 (5.9)	10.1 (5.8)	7.3 (6.8)	8.7/7.9	0.40	0.53	0.17
DUKe SSI	**Satisfaction (range 1-3)**	**Overall (n=80/68)**	2.9 (0.4)	2.9 (0.4)	2.9 (0.3)	2.9 (0.4)	2.9/2.9	0.31	0.58	0.09
		Italy (n=37/20)	2.8 (0.4)	2.8 (0.4)	3.0 (0.2)	2.7 (0.6)	3.0/2.8	2.65 [2.74]	0.11# [0.10]	0.45 [0.46]
		Poland (n=19/18)	2.8 (0.4)	3.0 (0.0)	2.8 (0.5)	3.0 (0.0)	2.9/2.9	0.33	0.57	0.20
		UK (n=24/30)	2.9 (0.3)	2.8 (0.5)	3.0 (0.2)	2.9 (0.4)	2.9/2.9	0.06	0.81	0.06
	Help (range 0-24)	**Overall (n=78/66)**	14.7 (2.6)	13.8 (2.3)	13.8 (2.1)	13.6 (2.0)	13.5/13.6	0.03	0.87	0.00
		Italy (n=34/20)	15.6 (2.6)	14.1 (3.1)	14.3 (1.7)	14.0 (2.1)	13.8/13.8	0.003	0.96	0.00
		Poland (n=19/18)	15.9 (2.1)	14.9 (1.5)	14.8 (2.3)	14.9 (1.9)	14.6/15.1	0.60	0.44	0.27
		UK (n=25/28)	12.7 (1.3)	12.9 (1.6)	12.4 (1.7)	12.4 (1.0)	12.4/12.4	0.01	0.93	0.00
	Support (range 6-18)	**Overall (n=82/68)**	15.0 (2.8)	14.9 (2.7)	15.7 (2.8)	15.2 (2.6)	15.7/15.1	2.02 [1.68]	0.16# [0.20]	0.24 [0.21]
		Italy (n=37/20)	15.2 (2.7)	14.8 (2.5)	16.7 (2.0)	15.2 (2.4)	17.0/15.8	3.08	0.09	0.45
		Poland (n=19/18)	14.8 (3.3)	16.1 (2.1)	16.2 (3.4)	16.9 (1.8)	16.7/16.4	0.24	0.63	0.17
		UK (n=26/30)	14.7 (2.7)	14.3 (3.1)	14.1 (2.7)	14.1 (2.7)	13.9/14.2	0.16	0.69	0.11

* significant difference at 95%, $p<0.05$.

Levene's test showed that the group variances were not equal, so an assumption of covariance analysis was violated[transformed using square root and ANCOVA repeated]

Table 3: Percentage of Meeting Centres Support Programme (MCSP) and Usual Care (UC) group participants having symptoms on the NPI at pre-test and post-test

	MCSP (n=93)		UC (n=74)	
NPI Item	**Pre-test**	**Post-test**	**Pre-test**	**Post-test**
Apathy	68%	70%	57%	66%
Depression/dysphoria	62%	63%	50%	46%
Anxiety	63%	63%	62%	62%
Eating problems	56%	47%	26%	23%
Agitation/aggression	47%	40%	36%	51%
Irritability/liability	53%	53%	45%	45%
Delusions	37%	32%	28%	24%
Aberrant motor behaviour	38%	34%	28%	32%
Sleeping disturbances	43%	50%	40%	34%
Hallucinations	20%	28%	20%	27%
Euphoria	13%	12%	11%	11%
Disinhibition	25%	31%	27%	30%

Table 4. Attendances for research participants over 6 months from pre-test to post-test by country and overall.

	N	Mean	SD	Min	Max
Italy					
Person with dementia - days attended MC	39	48.1	20.9	5	79
Carer hours of attendance	39	18.2 hours	19.8	1	74
Poland					
Person with dementia - days attended MC	20	63.7	18.7	3	83
Carer hours of attendance	20	19.4 hours	47.3	0.5	218.3
UK					
Person with dementia - days attended MC	28	34.7	15.7	11	63
Carer hours of attendance	22	65 hours	52.3	2	211.7
ALL COUNTRIES					
Person with dementia - days attended MC	87	47.4	21.5	3	83
Carer hours of attendance	81	31.2 hours	43.2	0.5	218.3

TABLE 5: Stage of dementia for Meeting Centres Support Programme and Usual Care participants by country at pre-test

GDS Stage (Reisberg)	All Countries		Italy		Poland		UK	
	MCSP (n=84)	UC (n=69)	MCSP (n=38)	UC (n=20)	MCSP (n=19)	UC (n=18)	MCSP (n=27)	UC (n=31)
Stage 1-2: No or Very Mild Cognitive Decline	7 (8.3%)	13 (18.8%)	2 (5.3%)	-	2 (10.5%)	4 (22.2%)	3 (11.1%)	9 (29.0%)
Stage 3: Mild Cognitive Decline	21 (25.0%)	9 (13.0%)	13 (34.2%)	1 (5.0%)	6 (31.6%)	4 (22.2%)	2 (7.4%)	4 (12.9%)
Stage 4: Moderate Cognitive Decline	27 (32.1%)	33 (47.8%)	16 (42.1%)	12 (60.0%)	6 (31.6%)	7 (38.9%)	5 (18.5%)	14 (45.2%)
Stage 5: Moderately Severe Cognitive Decline	24 (28.6%)	11 (15.9%)	6 (15.8%)	6 (30.0%)	5 (26.3%)	3 (16.7%)	13 (48.1%)	2 (6.45%)
Stage 6: Severe Cognitive Decline (Middle Dementia)	4 (4.8%)	3 (4.4%)	1 (2.6%)	1 (5.0%)	-	-	3 (11.1%)	2 (6.45%)
Stage 7: Very Severe Cognitive Decline (Late Dementia)	1 (1.2%)	-	-	-	-	-	1 (3.7%)	-