A quantitative meta-analysis of the effectiveness of psychosocial interventions in dementia

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Abstract

There is a high recognition of the fact that psychosocial interventions make an essential contribution in dementia care. However, the evidence for specific psychosocial interventions are mixed and limited yet. Therefore, we performed a meta-analysis of the relevant literature, to investigate the effectiveness of psychosocial interventions focused on improvements in cognition, behavior, mood and quality of life. To select the 10 studies included in the meta-analysis, we conducted an extensive search in the following databases: MEDLINE, PsychINFO, EBSCO, WEB OF SCIENCE. The results we obtained show that psychosocial interventions in dementia for cognitive abilities are effective, even if the effect size is low.

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1. Introduction

Dementias are the leading cause of disability among older people all over the world (Milne, 2010). Due to the increasing number of older people, the incidence of dementias will constantly increase (Choi, Lee, Cheong & Lee, 2009). For this reason, dementias will still be a topic of interest in terms of global health of older people (Mathers & Loncar, 2006). Also, dementias are the fourth most common cause of death in the age group over 75 years (Iliffe,
Moreover, dementias have a profound negative impact not only for the persons with dementia, but also for their families, caregivers, staff and for public health services, because the costs of care are huge and the life expectancy of patients is approximately 8 years (Lyketsos, Salvador, Chin, Baker, Black & Rabins, 2003). Considering all these, providing services for people with dementia has been recognized as a major public health priority in the UK and worldwide (Brookmeyer, Gray & Kawas, 1998; Banerjee, Willis, Mathews, Contell, Chan & Murray, 2007).

There is an increasingly higher recognition in the literature, related to the fact that, psychosocial interventions make an essential contribution in dementia care and they are effective also in terms of costs (Knapp et al., 2006; Vasse et al., 2012). Most of these psychosocial interventions aim to improve: cognitive abilities, behavior, mood or quality of life. In recent years, studies have shown that in terms of support for caregivers and management of neuropsychiatric symptoms, psychosocial interventions are most effective when they target individual and specific needs of patients and caregivers (Sorensen, Pinquart & Duberstein, 2002; O’Connor, Ames, Gardner & King, 2009). This type of interventions can be implemented with any type of dementia, are effective in any stage of dementia and were not reported side effects over time, compared with pharmacological treatments.

Although studies in the literature show that psychosocial interventions are effective in dementia care in general, the evidence for specific psychosocial interventions are mixed and limited yet (Livingston, Johnston, Katona, Paton & Lyketsos, 2005; Kverno, Black, Nolan & Rabins, 2009; Hulme, Wright, Crocker, Oluboyede & House, 2010). Moreover, to date, there is no integrative meta-analysis to test the effectiveness of these interventions in people with dementia. Therefore, our goal was to perform a meta-analysis of the relevant literature, to identify the indicators of size effects of psychosocial interventions focused on improvements in cognition, behavior, mood and quality of life. We wanted to offer a comprehensive examination of the effectiveness of psychosocial interventions in terms of preventing progress of cognitive impairment or in terms of changing the behaviour, mood and cognition of older adults with dementia, in order to increase their quality of life. For this purpose, we included studies that compared at least one of these interventions with a control group.

2. Method

2.1. Selection of studies

For this meta-analysis, we selected studies on psychosocial interventions in dementia which had the primary goal to improve cognitive abilities, problematic behaviors, mood and quality of life. For this purpose, we conducted an extensive search in the following databases: MEDLINE, PsychINFO, EBSCO, WEB OF SCIENCE using the search terms: dementia, psychosocial interventions, nonpharmacological treatment, efficacy, experimental interventions. We also searched the references of relevant articles (previous reviews and theoretical synthesis). The inclusion criteria for the studies were: 1) published in English; 2) published in peer review journals; 3) sufficient data to calculate effect size indicators; 4) studies that included only people with dementia, not caregivers or staff; 5) subjects with any type of dementia and severity; 6) studies having a control group and one or more experimental groups; 7) studies that have at least one of the four outcome of interest: cognitive abilities, problematic behavior, mood, quality of life. Respecting all the inclusion criteria, in the meta-analysis were included 10 studies.

2.2. Encoding the studies

For the 10 included studies, there were coded variables that were introduced later in the analysis. The following were encoded: identification data of the study (author, publication year); the number of subjects; age of participants; type of dementia; severity of dementia; institutionalized versus non-institutionalized; intervention format (individual or group intervention); outcomes of interest; instruments used to measure the outcomes. Studies included in meta-analysis were performed on a total of 565 subjects. There have been situations where in the same study, a specific outcome of interest was measured with different scales and we included all measurements in the analysis. We also included some data measured with subscales of different scales, where they measured one of the four outcomes of interest.
2.3. Statistical analysis

Based on the basic standard literature (Hunter & Schmidt, 2004), we computed the effect sizes (Cohen’s d). The results were evaluated on the same basis, following the effect size measures described by Cohen (0.2-0.5 = small effect, 0.5-0.8 = medium effect, 0.8< = large effect size) (Cohen, 1988). Data analysis was performed by the Meta-Analysis Calculator (http://www.lyonsmorris.com), complemented with custom written formulas. We calculated several types of effect sizes, based on the 10 studies included in the meta-analysis. The first computations resulted in 65 effect sizes for the four outcomes of interest taken together. Because we included in the meta-analysis studies using several measures for the same outcome, after closing up these, 27 effect sizes remained to work with. To compensate for the possible errors due to different sample sizes, we computed a corrected effect size measure (D and VarD) from the original effect size measure (d) to avoid the possible bias. We also computed the 95% confidence interval for the corrected effect size (D). We calculated all the effect sizes for the outcomes of interest based on post-intervention data and follow-up, if there were sufficient data available.

3. Results

We provide below the results we have obtained for the four outcomes of interest. (Table 1)

Table 1. Corrected effect sizes (D) for the outcomes of interest

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Outcomes</th>
<th>Study number</th>
<th>Total number of subjects</th>
<th>Corrected effect size (D)</th>
<th>VarD</th>
<th>95% confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Post-intervention</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Cognitive abilities</td>
<td>7</td>
<td>423</td>
<td>0.38</td>
<td>0.06</td>
<td>[0.19, 0.56]</td>
</tr>
<tr>
<td>2</td>
<td>Behavior</td>
<td>7</td>
<td>409</td>
<td>-0.18</td>
<td>0.06</td>
<td>[-0.38, 0.01]</td>
</tr>
<tr>
<td>3</td>
<td>Mood</td>
<td>5</td>
<td>357</td>
<td>-0.22</td>
<td>0.02</td>
<td>[-0.35, -0.09]</td>
</tr>
<tr>
<td>4</td>
<td>Quality of life</td>
<td>2</td>
<td>71</td>
<td>0.04</td>
<td>0.01</td>
<td>[-0.12, 0.20]</td>
</tr>
<tr>
<td></td>
<td>Follow-up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Behavior</td>
<td>3</td>
<td>193</td>
<td>-0.22</td>
<td>0.02</td>
<td>[-0.39, -0.06]</td>
</tr>
</tbody>
</table>

Regarding the outcomes of interest, the results show that for the outcome ‘cognitive abilities’ measured in post-intervention, the effect size (corrected depending on the number of subjects in each study) of psychosocial interventions is significant, but small (D = 0.38, VarD = 0.06, 95% CI = [0.19, 0.56]). It is noted that, when comparing the experimental group that received cognitive stimulation with the control group, those who received the intervention had a better performance. We also obtained in post-intervention a significant but negative size effect for the outcome ‘mood’ (D = -0.22, VarD = 0.02, 95% CI = [-0.35, -0.09]). For the other two outcomes measured post-intervention, the effect sizes obtained were not statistically significant. In follow-up, we only had sufficient data to calculate the effect size for the outcome ‘behavior’ and these data were reported in three studies. For the other three outcomes of interest, we only had one study for each type that reported follow-up data. Interesting was that this time, we also obtained for ‘behavior’ in follow-up a significant, but negative effect size (D = -0.22, VarD = 0.02, 95% CI = [-0.39, -0.06]).

4. Discussion

Studies show that psychosocial interventions are effective in dementia care in general, but more evidence is needed for specific psychosocial interventions. Here the results are mixed and limited, some studies showing improvements in cognition, behavior, mood or quality of life, while others reveal no differences between the control group and the experimental one. For this reason, we conducted a meta-analysis, where we included all studies on these four outcomes of interest that met the inclusion criteria.
The data we obtained for 'cognitive abilities', support the results of previous studies in the literature and show that psychosocial interventions in dementia for cognitive abilities are effective, even if the effect size is low. We also obtained some results that were not statistically significant or that were significant, but negative. There are several possible explanations for these results. Studies included in the meta-analysis are quite heterogeneous in terms of several variables that appear to influence the effectiveness of interventions. The severity of dementia and physical condition appear to play an important role. If people are in a relatively good condition, then it is likely that they will respond more positively to sessions during the intervention. For example, they are more attentive to their environment; they hold eye contact more appropriately, relate better to others, are less restless/aggressive, more cooperative. The persons making the intervention have an important role. If they are familiar with people with dementia, then they will respond better. The intervention format (individual or in group) and if the person is cooperative. The persons making the intervention have an important role. If they are familiar with people with dementia, then they will respond better. The intervention format (individual or in group) and if the person is cooperative.

Moreover, the studies included were only those who had a control group and one or more experimental groups. To see to what extend one can get different results about the effectivenes of such type of interventions for these outcomes and about the maintenance of the effects in follow-up, future studies should include in the analysis different types of experimental designs (e.g. same group pretest-posttest, 2 or more experimental groups).

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References