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Feature Article

The development of the MIBBO: A measure of resident preferences for physical activity in long term care settings

Melanie Kleynen, MSc [a,b,*], Susy M. Braun, PhD [a,c,d], Kim van Vijven, MSc [a], Erik van Rossum, PhD [a,c,d], Anna J. Beurskens, PhD [a,e]

[a] Research Centre for Autonomy and Participation of People with a Chronic Illness, Zuyd University of Applied Sciences, Faculty of Health, Heerlen, the Netherlands
[b] Adelante Rehabilitation Centre, Department of Brain Injury, Hoensbroek, the Netherlands
[c] Research Centre for Technology in Care, Zuyd University of Applied Sciences, Heerlen, the Netherlands
[d] Department of Health Services Research, CAPHRI, School for Public Health and Primary Care, Faculty of Health, Medicine and Life Sciences, Maastricht University, Maastricht, the Netherlands
[e] Department of Family Practice, CAPHRI, School for Public Health and Primary Care, Faculty of Health, Medicine and Life Sciences, Maastricht University, Maastricht, the Netherlands

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ABSTRACT

Offering physical activities matching with the preferences of residents in long-term care facilities could increase compliance and contribute to client-centered care. A measure to investigate meaningful activities by using a photo-interview has been developed ("MIBBO"). In two pilot studies including 133 residents living on different wards in long-term care facilities, feasibility, most chosen activities, and consistency of preferences were investigated. It was possible to conduct the MIBBO on average in 30 min with the majority (86.4%) of residents. The most frequently chosen activities were: gymnastics and orchestra (each 28%), preparing a meal (31%), walking (outside, 33%), watering plants (38%), and feeding pets (40%). In a retest one week after the initial interview 69.4% agreement of chosen activities was seen. The MIBBO seems a promising measure to help health care professionals in identifying residents' preferred activities. Future research should focus on the implementation of the tailored activity plan, incorporating it into the daily routine.

Introduction

In numerous studies, it has been established that physical activity, even with low intensity, has beneficial effects on both physical and mental functioning in older people aged 65 years and over.[1–3] Despite these benefits, it has also been shown that many people in this age group are insufficiently active to achieve these positive effects. They hardly meet the required 30 min of moderate physical activity a day, as recommended by several international guidelines.[4–6] A specific sub group within this target population is formed of residents of long-term care facilities (e.g. nursing homes). They are, on average, (even) less active than their peers living at home and, in addition, due to cognitive and communicative impairments, they are often difficult to stimulate to become more physically active.[7,8]

The American College of Sports Medicine defines physical activity as 'body movement that is produced by the contraction of skeletal muscles and that increases energy expenditure'.[2] According to this definition, all sorts of routine activities in daily life have a 'natural' activity component. For example, activities such as setting the table for a meal and watering plants involve walking, reaching, grasping, and carrying. Daily activities residents prefer to do could be integrated in their daily routines, increasing their physical activity level and contributing to person-centered care. However, according to a recent study, only a minority of residents (18%) seem to participate in these kinds of routine everyday activities.[9] In these types of activities, informal and professional caregivers can be involved to supervise residents, but at least partly the residents may perform them independently. This increases the physical activity opportunities for residents as they are not merely dependent on the caregivers' availability or a specific location (e.g. gym).

Many long-term care facilities organize exercise activities for their residents, such as gymnastics, walking programs or recreational activities (e.g. woodwork) that may have a physical component. Residents are invited to participate in these activities but

* Corresponding author. Zuyd University of Applied Sciences, Research Centre for Autonomy and Participation of people with a Chronic Illness, P.O. Box 550, 6400 AN Heerlen, the Netherlands. Tel.: +31 (0)45 4006366; fax: +31 (0)45 4006369.
E-mail address: melanie.kleynen@zuyd.nl (M. Kleynen).

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often caregivers have limited insight into which kind of activities residents prefer. The activity program is often based on what the institute has to offer, not on what the residents would like to do.

Including residents' preferences in selecting activities can improve interest and compliance.[10] According to the recommendations of the American College of Sports Medicine and the American Heart Association every older adult (aged 65+ years) should have a physical plan based on individual abilities and preferences.[6] The same is true in the Netherlands. The Dutch Inspectorate for Health Care has defined seven modules for physical activities in elderly care that must be taken into account when developing personalized activity plans. According to one of these, health care facilities need to incorporate the wishes and preferences of elderly people when planning, performing, and evaluating policy with regard to physical activity.[11] However, it remains unclear how the perspective of this communication vulnerable group of residents in long-term care facilities can be investigated.

A variety of generic and standardized assessments and tools to investigate abilities of older adults on different levels (e.g. cognition or mobility) are available for care professionals. With the increase in client-centered care, more individualized tools and measures to explore a person's needs, preferences, and aims have been developed. The existing tools are, however, related to goal setting within rehabilitation or to a certain medical treatment.[12,13]

A measure to identify preferences with regard to physical activities tailored to the situation of residential long-term care facilities has therefore been developed. The measure is named "MIBBO" which is a Dutch acronym for "Measure to Identify Meaningful Physical Activities in the Elderly". The aim of this study was to investigate:

1) The feasibility of the MIBBO in residents of long-term care facilities
2) Which activities residents of long-term care facilities prefer
3) How consistent preferences of residents are over a short period of time (1 week).

Material and methods

Design

This study was a descriptive study in two phases testing preliminary use of the MIBBO. First, feasibility was assessed in a small sample. Subsequently, the MIBBO was used with a larger sample to identify the activities that residents chose most often. In this second phase, a test-retest procedure was embedded using a subsample to research how consistent the preferences of residents were.

Sample

The population of residents in long-term care facilities is heterogeneous in terms of physical, communication, and cognitive impairments. Therefore, two long-term care facilities covering the entire scope of different subpopulations participated: a nursing home and a long-term facility for residents with psychiatric disorders.

For phase one of the study, ten residents of both a somatic and a psychogeriatric ward of the nursing home ($n = 10$) were selected by physiotherapists and occupational therapists working on the ward (selected sample). In the second phase of the study several subpopulations of residents of both long-term care facilities ($n = 123$) participated: 46 residents of geriatric rehabilitation wards, ranging from orthopedic rehabilitation and lung rehabilitation to rehabilitation after acquired brain injury; 52 participants lived in a psychogeriatric nursing home and 25 participants lived on wards for residents with psychiatric disorders. Nurses working on the wards selected these residents (convenience sample).

Eligibility consisted of two criteria. First, only residents who were at least able to actively initiate one- or two-sided reaching and grabbing from a seated position were eligible to participate. Second, residents should be able to answer closed questions (i.e. yes-no questions), either by speech or by nodding. Eligible residents were invited to participate unless they were specifically excluded by their medical doctor or responsible nurse (e.g. if they experienced delirium). In Table 1 an overview of the numbers of residents living on the participating wards at the time of the study is provided, together with the number of residents invited to participate and those who actually participated.

The participating long-term care facilities already used the MIBBO as part of usual care or institutional policy. No individual data on patient characteristics were necessary for this purpose and, therefore, were not collected. As no identifying information was collected and no procedures additional to usual care were applied, exemption was considered and no written informed consent was obtained. Residents were informed about the aim and duration of the interview and were free to refuse participation. The use of the MIBBO was approved by the local ethics board (METC Atrium, Orbis, Zuyd; 12-N-20; 13-N-152; 13-N-173) and the management of the participating centers. The participating population is comparable to the general population of Dutch long-term care residents as described in other studies. In these studies the average age of residents included was, for instance, 83.4 years (SD 6.0) and in general more women than men live in Dutch long-term care facilities.[14,15]

Procedure

In phase one of the study, physiotherapists, occupational therapists, and students, who were familiar with the procedure, conducted the MIBBO. During the ten interviews an interviewer and an observer were present. They were instructed to observe the handling of the steps and material of the MIBBO and the specific reaction of the resident. Afterwards, both the interviewer and observer were asked to report their experiences using a questionnaire, which focused on the feasibility of the MIBBO. Three main topics were discussed: 1) Did the residents understand and like the use of the MIBBO based on the observation made during the interviews?; 2) How long did it take to conduct the MIBBO?; 3) Were the instructions and the material clear (i.e. manual and material, photo-cards)?

Table 1
Overview of participants per ward in phase two of the study.

	Number of residents who lived on wards	Number of residents asked for participation	Number of residents who agreed	Number of residents who completed the MIBBO
Geriatric rehabilitation wards of nursing home				
- Orthopedic care	23	23	22	20
- Collum care	16	16	15	15
- Lung care	24	6	5	4
- Brain injury	15	5	4	3
Psychogeriatric ward of nursing home	160	52	52	42
Ward for elderly people with psychiatric disorders	38	28	25	21
Total	276	130	123	105

Table 2
Procedure of the MIBBO in seven steps. For each step the aim and how to perform the step is described.

Step	Aim	Description
0	Selection of picture cards	Selection of pictures: • E.g. sort out gender specific activities and activities that cannot be performed at the location
1	Personal details and contra-indication	Reporting: • Personal details of the resident • Individual factors that may influence physical activity execution (e.g. safety while walking)
2	Explanation of process and open-ended questions about physical activity	General questions concerning physical activities at present and in the past are asked to get a general idea of the resident's preferences, interests, ideas and motivation with regard to physical activity, previously and at present. • Information can be used as input for the next steps • Communication skills and cognitive functioning can roughly be assessed
3	Photo-interview: Sorting picture cards	Thirty-two picture cards of activities are shown to the resident, which he/she can sort into two categories: 'I would like to do this activity' or 'I do not want to do this activity'. • To indicate the two categories one green colored card ('yes') and one red colored card ('no') are used • A 'wish card' can be used to stimulate the resident to name (an) additional activity/activities he or she would like to do, which is/are not included in the picture cards
4	Selection of 'favorite five' activities	The resident chooses his or her 'favorite five' activities from the green pile of cards.
5	Preferences: How and when?	The resident can decide how he/she would like to perform the chosen activities. Choices can be made between: • Indoor or outdoor • Individual or group • Time of the day (i.e. morning, afternoon or evening) Pictograms can be used to assist these choices.
6	Creation of individual physical activity plan	An individual physical activity plan is made, which can be embedded in the resident's care plan. The multidisciplinary care team of the resident should discuss: • When will the activity take place, how many times a week? • What kind of supervision is needed and who provides this supervision?

In the second phase, a trained senior nursing student conducted the MIBBO with 123 residents. She documented whether it was possible to conduct the measure and, if it was impossible, the reasons why. Data on activities that were chosen most often by the residents were collected. A test-retest was performed in a subsample approximately a week after the initial interview to assess the consistency of the preferred activities. The retest was set after one week in accordance with a study investigating the consistency of self-reported preferences for everyday living in different populations, including residents of a nursing home.[16] A subsample of 17 participants was chosen for this purpose based on availability ($n = 17$). The participants were not informed about the aim of the retest.

Measure

The MIBBO was developed using an iterative process by an expert panel (physiotherapists, occupational therapists, nurses, and researchers) in close collaboration with caregivers at two long-term care facilities in the Netherlands. The aim of the MIBBO is to identify the preferences of residents in long-term care facilities with regard to the type and setting of physical activities they would like to undertake. During the development of the MIBBO, a very broad definition of 'physical activity' was used and the intensity of activities was not taken into account. Since the level of physical activity among nursing home residents is often (very) low, any additional physical activity is desirable, irrespective of the intensity level.[1]

The conditions the measure should meet were defined as: 1) it can be used by different care disciplines; 2) it is easy to apply; 3) it is applicable for the majority of nursing home residents including a wide range of characteristics (e.g. with or without cognitive and communicative impairments); and 4) it covers a wide range of activity options which match the possibilities in various care facilities. An exploratory literature review was performed to search existing tools and measures for identifying preferred activities. Within the context of rehabilitation and therapy several instruments and tools were identified that can assist caregivers to determine patient needs and related therapy aims. Examples are the Photograph series of Daily Activities (PHODA),[17,18] Activity Card Sort (ACS),[19] Canadian Occupational Performance Measure (COPM),[20] Goal Attainment Scale (GAS),[21] the Patient Specific Functional Scale (PSFS),[22] and the Talking Mats.[23] However, these existing tools are often not suitable for use with long-term residents as they focus on the client's functioning in his/her own environment after discharge or are too difficult for this vulnerable group in which communication problems are highly prevalent. However, useful elements and principles of the identified measurement tools were extracted.

Based on the results of a literature search and the experiences and opinions of the expert panel, it was decided that the measure should contain a photo-interview.[24,25]

A concept version of the MIBBO met the aim and conditions as described above and was tested in preliminary pilots. Through an iterative process, the measure was improved, resulting in a final version presented in Table 2. The MIBBO consists of seven steps. Its basis is a photo-interview with picture cards divided into activities of daily living (ADL, e.g. dressing), household activities (e.g. watering plants), creative activities (e.g. orchestral), and activities within fitness and sports (e.g. dancing) (Fig. 1). In each category, picture cards have the same colored background. The MIBBO further contains a manual including background and purpose of the measure, an interview guide, and a scoring form. Based on the results of the MIBBO, an individual physical activity plan can be made, that can be embedded in the resident's care plan.

Data-analysis

To assess the feasibility, information regarding the time to conduct the MIBBO and the usability of the material, were extracted from answers to the questionnaires filled in by the interviewer and observer in phase one of the study. In addition, the number of residents who were able to complete the MIBBO within one session was described (phase two).

Based on the results of the second phase of the study, percentages of the five most often chosen activities were calculated.

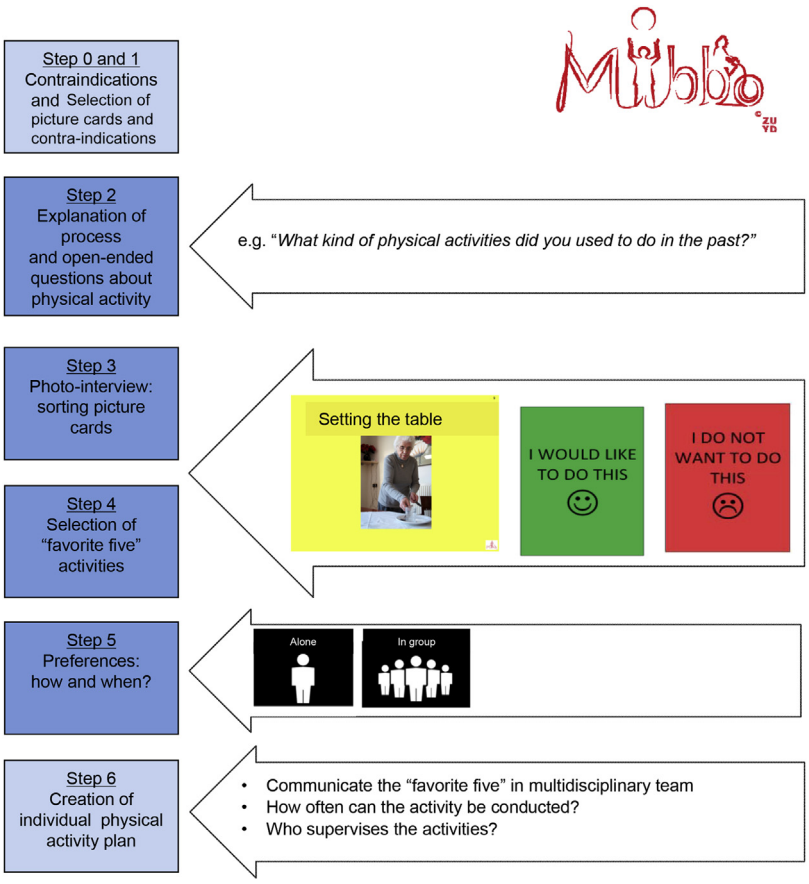

Fig. 1. Steps of the MIBBO with examples.

Percentages of agreement with the selected 'favorite five' activities were calculated in the subsample. In accordance with comparable studies where preferences related to everyday activities were investigated, an agreement of about 70% was considered acceptable agreement.[16,26]

Results

The results of the study are presented according to the three research questions.

Feasibility

Within the first pilot study, interviewers and observers reported that all participating residents in general understood the procedure of the MIBBO and wished to participate in the interview. Remarkably, most residents did not perceive activities of daily living, such as grocery shopping or getting dressed, as physical activities. The 'wish card' was found to be too abstract and needed more explanation. The MIBBO could, on average, be conducted in 30 min. The pictures proved to be clear and recognizable for the participants. The interviewers stated that processing the results of the scoring manual was easy to perform. The interviewer reported that the results from the MIBBO did not only provide important information about the preferences of the residents regarding physical activities, but a variety of other information related to residents' functioning on the ward was often revealed (e.g. cognitive functioning, relationship to informal caregivers, and general meaningful moments during daily life on the ward).

In 105 of the 123 (85.4%) participants in phase two of the study the MIBBO could be conducted within one session, including residents with impairments on a cognitive and/or communicative level (Table 1). Two cases illustrate the wide range of potentially eligible participants. The first case was a German resident who did not speak Dutch, whereas the MIBBO has been created in Dutch. However, the picture cards enhanced understanding of which activities were meant, allowing this resident to communicate his activity preferences. The second case was a resident who had become aphasic after stroke. For this resident, visualizing the choices through the picture cards also proved a good way to enable communication about preferred physical activities.

In 18 of the 123 residents (14.5%) of the larger sample the MIBBO could not be used ($n = 4$, geriatric rehabilitation, $n = 10$, psychogeriatric nursing home; $n = 4$ residents with psychiatric disorders). The cognitive impairments of these residents were too severe for them to understand and/or follow the instructions or questions.

Most frequently chosen activities

Within the 105 residents with whom the MIBBO (second phase) could be performed, the most chosen activities varied. They differed by resident and ward; the overall top five most frequently chosen activities, however, were: gymnastics and orchestra (each 28%), preparing a meal (31%), walking (outside, 33%), watering plants (38%), and feeding pets (40%).

Consistency of preferences over time

The 17 residents who participated in the test-retest procedure selected a total of 85 activities as their 'favorite five'. During the retest, they again selected 85 activities, of which 59 were the same

as during the first test (69.4%). Two participants chose the same five activities as during the initial interview. Seven participants chose four of the five initially chosen activities and five residents chose three of the five initially chosen activities. Three participants chose two of the five initially chosen activities.

Discussion

In this study, a measure to identify preferred physical activities of residents in long-term care facilities, the MIBBO, was developed and evaluated. The MIBBO was considered to be feasible for use with most of the participating residents based on the following results. First, in general, the residents understood the procedure of the MIBBO and wished to participate in the interview. Second, care professionals needed 30 min on average to conduct the MIBBO. Although this is a relatively long time period, the participating professionals reported that the procedure was worth the time invested. Third, professionals found the manual and materials – picture cards and pictograms – feasible for use with residents with a wide variety of impairments. Fourth, with the majority of participants, the MIBBO could be performed in one session ($n = 115$, 86.4%).

The most frequently chosen activities were: gymnastics and orchestra (each 28%), preparing a meal (31%), walking (outside, 33%), watering plants (38%), and feeding pets (40%). Of these, preparing a meal and watering plants are activities that could be integrated in ward daily routines without formal supervision (at least for some residents). Supervision might also be provided by informal caregivers or other staff (e.g. cleaning and cooking staff). The most frequently chosen activities are comparable to those of a recent study in which community-dwelling elderly people were interviewed and 'walking, housework, and gardening' were identified as preferred physical activities.[27] The results of the test-retest indicated that choices within the MIBBO of residents seem to remain relatively consistent over a one week time period (69.4% agreement of the top five preferred activities). Some variation in choices for activities was expected between the initial interview and the retest because it is plausible that residents reconsidered their choices because of increased awareness of possible activities. The test-retest study was performed in a small sample and should be interpreted with care.

In our experience, residents seldom mentioned unrealistic preferences in activities. If so, these should be taken seriously. It would be important to try to understand what makes the chosen activity important or meaningful to the residents. Knowing the features that make the activity attractive may help the multidisciplinary team find an adaptation of the activity or a possible alternative together with the residents.

Results showed that the MIBBO could help caregivers to gain insight into the activity preferences of their residents. In addition, a variety of other information related to the residents' functioning on the ward and preferences in other areas was often revealed, which supports person-centered care. It is therefore debatable if 30 min is considered too lengthy. A good assessment and insight into individual preferences might save time in the future and enables involvement of residents in choices and decisions about their care.[28] The time to conduct the MIBBO might also be decreased through training (making it a routine skill).

Limitations of the study

The current study did not collect any demographic information on the participating residents (e.g. age, gender, diagnoses). Therefore, no conclusions can be drawn with regard to the specific characteristics of the population in which the MIBBO is feasible.

Within this study, the feasibility of the MIBBO and identification of preferred activities were the central points of interest. Future research should, therefore, also investigate the possibilities of including the selected activities in a tailored activity plan and the implementation of this plan in daily routines. From this study it remains unclear if and how the preferred activities should be organized within the care facilities without increasing the burden for professional caregivers. The organization (e.g. involving housekeeping staff) as well as the physical environment of the ward (e.g. interior of the dining room), simple technology (e.g. use of smart watches to remind residents of the activities), and informal caregivers (e.g. proxies and volunteers) should be involved in order to enable the residents to perform the preferred activities as autonomously as possible.

Conclusion

The MIBBO seems a promising measure to help health care professionals identify residents' preferred activities and tailor physical activity plans. These activities can be embedded in daily routines. Future research investigating the relation between the residents' abilities and characteristics, and the support needed to perform the preferred activities is warranted, as well as research assessing the benefits of performing the preferred activities for the residents' functioning.

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