INMU-EVALUATION

An evaluation of the inmu at 3 municipalities in Sweden: Norrköping, Lund, & Helsingborg

Abstract

This report includes an evaluation of the inmu, which is a pillow with calming vibrations for individuals with dementia and other similar symptoms. Thirteen participants from three municipalities in Sweden participated in the evaluation. Every fourth week, they reported how the inmu had changed their symptoms and overall condition. The results showed that a large majority (approximately 80%) experienced significant improvements in their symptoms after using the inmu. This suggests that the inmu worked well for a large group of individuals with the current symptoms.

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Introduction

Approximately 50 million people in the world currently live with some form of dementia (WHO, 2020, May). Dementia is a permanent incurable disease that eventually leads to death (Sundelöv, Tegman, & Hoffman, 2019). In order to mitigate the disease, it is important to offer individuals with dementia different forms of life-enhancing activities. For example, the Swedish National Board of Health and Welfare advised that assistive technology be used more often as an alternative treatment in order to prevent loneliness, strengthening the quality of life, and increase the independence of individuals with dementia (Socialstyrelsen, 2017).

One such activity to increase the quality of life may be the use of the inmu. The inmu is a pillow which plays calming music and vibrates, which is thought to stimulate several different senses in the user. The inmu has previously been evaluated in a Danish study with 50 individuals at several care homes, where it was found that it had very positive effects and contributed to increased social interaction between the patients and the staff. However, it might be meaningful to investigate if these positive effects also would be present in a Swedish context. Therefore, this evaluation aims to study the conditions that exists for the inmu as an alternative tool in a satisfactory palliative care (where dementia is included) and look at what effects inmu has had on people with dementia in three municipalities in Sweden: Norrköping, Lund, and Helsingborg.

Method

Participants

Ten residents in two different care homes initially participated in the evaluation. After 16 weeks, an additional three residents were included from one care home. They were all in a palliative phase of their care and were included in the evaluation because of their perceived suitability for the study (based on recommendations from the nurses). The participants received an anonymized number to be able to follow their development throughout the study. No sensitive information that could identify the participant was collected.

Materials

The survey consisted of a questionnaire which was distributed to the nurses who then filled out the questionnaire on behalf of the residents. The questions were based on NPI which is a scale that was developed in order to measure behavioral symptoms (BPSD) in different forms of dementia (Cummings et al., 1994). The basic version of NPI is NPI-10 and includes 10 symptom areas: delusions, hallucinations, dysphoria, anxiety, agitation/aggression,

euphoria, disinhibition, irritability/lability, apathy, and aberrant motor activity (Cummings et al., 1994). The questions initially related to the resident's BPSD-score before and after inmu had been introduced as a cure for the resident. This was in order to be able to investigate whether there had been a significant change in the BPSD-score after the introduction of the inmu.

The participants were also asked the question on which BPSD-symptoms inmu had been introduced to solve/mitigate and on which of the symptoms inmu had the largest positive effect. The aim of these questions was to investigate on which BPSD-symptoms inmu seemed to work well and identify symptoms where it potentially did work less well.

They were also asked to rate how large positive influence the inmu had for the resident on a scale from 1 (*very little positive influence*) to 10 (*very large positive influence*). The aim of this question was to examine whether the respondent perceived that the inmu generally had a positive or a negative influence on the resident.

The respondents were also encouraged to reflect further through open questions. These questions related to whether the resident who had used the inmu had changed, which types of BPSD-symptoms the inmu worked best for, and if they would recommend the inmu to other similar resident wards. By giving the respondents the opportunity to give open ended responses, the goal was to capture observations which had not been brought up in the closed ended questions.

Procedure

The evaluation started in October of 2019 and continued until May of 2020 (approximately 7 months). The respondents answered the questionnaire every 4 weeks which meant that there were, in total, five different evaluation time points (4, 8, 12, 16, & 20 weeks). The respondent filled out the questionnaire in relation to the resident's ordinary BPSD-assessment (in order to ensure the information would be as similar as possible to the ordinary BPSD-assessment). After filling out the questionnaire, the respondents were thanked for their participation and reminded that the next evaluation were to take place within 4 weeks (except the last week when no reminder was given).

Results

The results of the evaluation will be presented below. In order to emphasize the statistical analyses, the arithmetic mean of each resident for the period in which they participated in the study was used.

Quantitative (numerical) responses

In general, the BPSD-scores decreased on average with 4.72 scores after using the inmu, with some residents experiencing a decrease of up to 48 BPSD-scores (this is illustrated in Table 1). Of all the residents who used the inmu, an overwhelming majority of them (approximately 80%), experienced an improvement in their BPSD-score after using the product (this is illustrated in Figure 1). It can therefore be concluded that the inmu seemed to have worked well on most of the residents who used the product.

Table 1. *The average change in BPSD-scores during the period, the direction of the change, and descriptive statistics for the inmu users*

Anonymized user of inmu[a]	Average change in BPSD scores during the period (20 weeks)[b]	Direction of change	Descriptives
1	-22,00	Decrease	Average decrease (entire
2	-7	Decrease	group):
3	5,67	Increase	*M* = -4,72
4	-9	Decrease	
5	29,2	Increase	Average decrease (only
6	-6,8	Decrease	decrease):
7	-6,5	Decrease	*M* = -9,87
8	3	Increase	
9	-3,6	Decrease	Proportion decreased:
10	-7,4	Decrease	10/13 = 0.769=76,9%
11	-13,5	Decrease	
12	-13,67	Decrease	
13	-9,75	Decrease	

[a]Some users were added later to the evaluation. For these users, the average score was calculated for the period in which they participated in the evaluation.

[b]The reporting was conducted every fourth week.

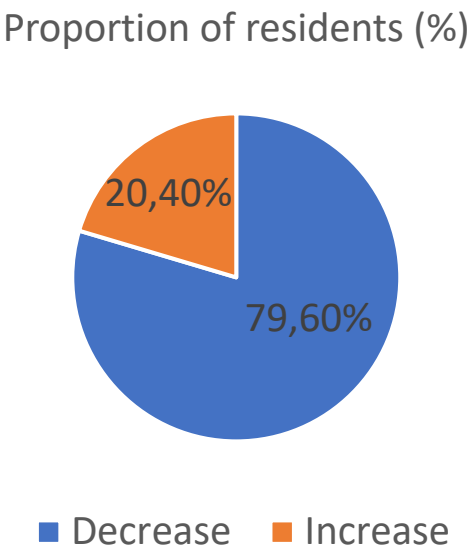

Figure 1. *Proportion of residents (%) who had experienced an increase or decrease in their BPSD-score during the period (entire group)*

If instead, one focus on the individuals where the inmu had a positive effect (approximately 80% of cases), the improvement was 9.87 BPSD-scores, which is a considerable improvement.

Regarding the question on how large positive impact the inmu had for the resident from 1 (*very small positive impact*) to 10 (*very large positive impact*), the average was 6.27, which means that, on average, the inmu had a fairly positive impact on the residents (this is illustrated in Table 2). Furthermore, approximately 70% of the users experienced a large positive impact (this is illustrated in Figure 2).

Table 2. *Average positive impact during the period, the size of the impact, and descriptive statistics for the inmu users*

Anonymized user of inmu[a]	Average positive impact during the period (20 weeks)[b]	Impact size[c]	Descriptives
1	7,8	Large	Average positive impact
2	8,6	Large	(entire group):
3	3,67	Small	*M* = 6,27
4	5,8	Large	
5	2,8	Small	Average positive impact
6	8,2	Large	(only large impact):
7	6	Large	*M* = 7,24
8	5,2	Small	
9	4,6	Small	Proportion large impact:
10	6	Large	9/13 = 0.69=69%
11	7,8	Large	
12	6,75	Large	
13	8,25	Large	

[a]Some users were added later to the evaluation. For these users, the average score was calculated for the period in which they participated in the evaluation.

[b]The reporting was conducted every fourth week.

[c]The size of the impact was considered large if the average during the period was higher than the mid-point of the scale (5.5).

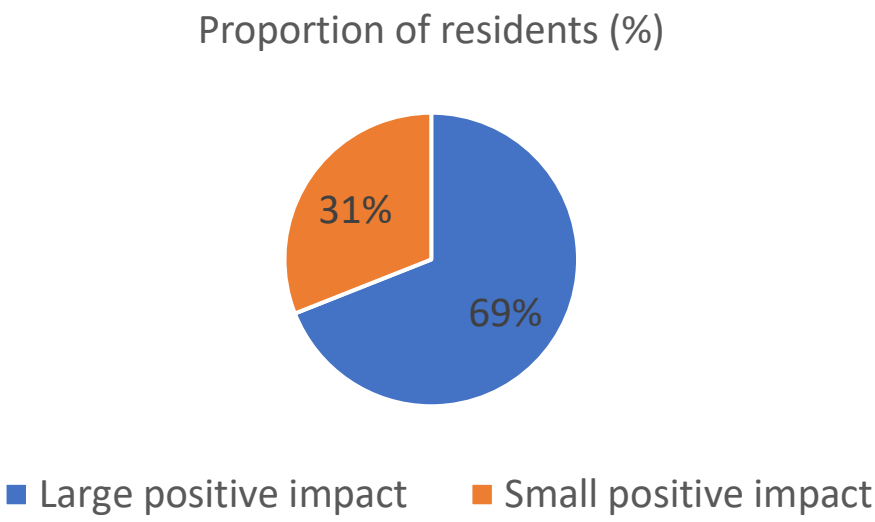

Figure 2. *Proportion of residents (%) who experienced a large or small positive impact from the inmu during the period (entire group)*

However, if only focusing on the participants where the inmu had a positive effect (approximately 70% of the ratings had the value 5.5 or higher), the average value was 7.24, which suggests that the majority of the respondents saw a fairly positive effect on the participants.

Thus, it is possible to see a tendency of there being two groups of residents, one where the inmu worked very well, and another group (considerably fewer residents), where the inmu did not work as well. The best way to investigate to which group a specific resident belong, would possibly be to test the pillow during a shorter period and see if it seems to have a positive effect. Most residents (approximately 70-80%) will likely see significant benefits from the inmu, but a smaller group (approximately 20-30%) may not experience as large positive effects.

Qualitative responses

The qualitative responses suggested that the inmu had worked best for the symptoms of agitation/aggression, aberrant motor activity, and irritability/lability. This indicates that the inmu may work very well for residents with these types of symptoms. One could theorize that the vibrations and the music from the pillow calms the resident and that this calming effect could be particularly effective for the above-mentioned symptoms. This is also something which emerged in the qualitative responses which suggest that the calming effect in particular might be an important characteristic of the product. Several respondents also perceived the product to be easy to use which means that no comprehensive training is needed in order to use the product.

However, there were some comments about the inmu not functioning as well in certain situations and for residents with larger caring needs. This suggests that there might be a spectrum of symptoms where the inmu might work very well, while other actions may have to be put in place if the symptoms are more extensive and challenging. Yet, it is important to remember that the current evaluation did not specifically focus on the smaller group of residents who had more extensive and challenging symptoms (and hence where the inmu did not work as well). Instead, this would be an interesting research question for a future evaluation of the product.

Finally, some respondents argued that the inmu did not work for all residents and that it is important to have a trial and error approach when finding the type of individual who benefits most from the inmu. At the same time, several respondents indicated that they would recommend the inmu to other simiar care wards. The willingness to recommend a product has been shown in previous research to be a reliable indicator of how satisfied a customer is with a certain product, which indicates that a large majority of the respondents were satisfied and pleased with the product after all.

References

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