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Using boom whackers in geriatrics: A pilot study on depression, anxiety and dementia

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Abstract

Introduction: Due to the corona pandemic starting in 2020 and the resulting rules for distancing and hygiene, boom whackers appeared as a good alternative to music therapy with singing and instruments.

Aim and method: For this purpose, a total of 47 patients (33 female and 14 male) of a geriatric day clinic, aged 61 to 91 years (M=79.4 years, SD=6.06), took part in a pilot study. Group 1 consisted of cognitively unimpaired patients with mental health problems, group 2 included patients with dementia. Each of them received a 30 to 40-minute group musical intervention with the boom whackers twice a week. During the music-playing, a standardized behavioral observation was carried out; before and after the group therapy, the well-being as well as psychological and physical symptoms (anxiety, depression, pain) were assessed.

Results: Results indicated that all participants were actively playing music with the boom whackers, whereby cognitively intact patients coped better with the new challenge. Well-being improved and complaints decreased significantly by participating in the group lessons. Implications for Practice. Considering the demonstrated results, a long-term implementation of boom whackers intervention in geriatrics and geriatric psychiatry is recommended.

Keywords: Music therapy; Mental health; Dementia; Depression; Aged.

Purpose

Music therapy in geriatrics: Music therapy is now also established in work with older adults [1] was able to demonstrate that music-making skills can be developed and maintained in later adulthood, and therefore engagement with music may be a factor contributing to healthy aging. The relationship between instrumental musical activity and cognitive aging was examined by [2]. Using various neuropsychological tests with subjects, it was found that individuals with at least 10 years of musical experience performed better cognitively than those without any musical experience. The correlation results of this study suggest that cognitive function in advanced age can be maintained primarily through high levels of musical activity throughout the lifespan.

Positive effects of active music-making on emotional, cognitive, and social well-being have also been demonstrated [3,4]. In this regard, music therapy has been shown to improve depressive symptoms in older people in particular including [5-11]. Positive effects with regard to anxiety have also been evidenced [8]. Music therapy with dementia patients is now also well researched, with positive effects demonstrated on cognitive functioning [12-14] but also neuropsychiatric symptoms and behavioral disturbances [15-21].

Several meta-analyses have also demonstrated positive effects of music therapy in patients with Parkinson's disease, insomnia, autism spectrum disorders, oncological disorders, coronary heart disease, functional gastrointestinal disorders, asthma, tinnitus, and chronic pain [22-25]. All music therapy

interventions consisted of active playing of instruments or singing; the use of boom whackers in the old age has not been studied to date, although we are aware of reports of clinicians using boom whackers on older people. Despite an intensive search in the international literature, we found only one report by [26], in which boom whackers are mentioned in the selection of instruments in geriatric residential facilities.

Boom whackers: Boom whackers are colorful plastic tubes that are used for playing music together in groups and are mainly found in educational settings with children and young people. They were invented by Craig Ramsell in Arizona/USA in the mid-1990s. By hitting the plastic tubes on the thigh or in the palm of the hand, the respective sound of the tube is heard. No previous musical knowledge is necessary for playing with the Boom whackers. Due to the easy handling, the Boom whackers are also well applicable for group leaders who have no previous musical experience. Knowledge of music notation is not mandatory, since only color vision is necessary for playing according to templates for songs or rhythm exercises. Especially for insecure and so far musically rather inexperienced people or even for those who have had negative experiences with music in their past, playing with the Boom whackers is an inviting and easy access to the world of music. Accordingly, making music with the Boom whackers is especially suitable for working with musical amateurs, even inexperienced people can immediately make music with an instrument that is completely foreign to them. For experienced musicians, on the other hand, there are complex pieces of music, so that the Boom whackers can be quite a challenge even for professionals.

Patients and methods

Within the naturalistic design, the use of boom whackers was investigated at a geriatric day clinic. In this day-care facility, multimorbid geriatric patients usually from the age of 70 are treated by a multiprofessional team. The patients' diagnostic spectrum ranges from geriatric syndromes to internal, neurological, psychiatric/psychosomatic and orthopedic diseases. The most common comorbidities are gait disorders and fall syndrome, arterial hypertension, diabetes mellitus, chronic pain, depression, and dementia. In addition to acute medical diagnostics, treatment also includes intensive individual and group therapy, including motor groups to promote mobility, cognitive training both preventive and for existing cognitive deficits, biography work for dementia, or psychological groups (relaxation, conversation group, education). Until the beginning of the pandemic, a music therapy group was also an established part of the treatment offering. This was an active music therapy aimed primarily at cognitively impaired patients, who sang songs known from their biography together under the guidance and accompaniment of a guitar. Due to the pandemic-related hygiene guidelines, the music group unfortunately had to be discontinued; making music with boom whackers was to be implemented as an alternative to singing. At this point, the present pilot study was conducted. The study was designed as a pilot study and was based on the CONSORT checklist extension for pilot/feasibility research. We also refer to the music-based intervention reporting criteria [27]. The main research question was: Is a musical group intervention with the use of boom whackers in geriatrics feasible instead of the previously known music therapy services? In addition, it was investigated how music making with

Boom whackers works with dementia patients and cognitively unimpaired but psychologically impaired patients and whether music making has a direct influence on well-being and psychological symptomatology.

The intervention period was set at three months with the aim of including at least 30 patients to enable initial statistical analyses. A total of 47 patients participated in the study from July to September 2021, consecutive admission during the pre-determined period of three months, the average age was 79 years (range 61-91 years), 70% were female. Based on the admission diagnoses, patients with mental symptoms (depressiveness, anxiety, pain) were assigned by study director to group 1, patients with dementia to group 2. The majority of participants from group 1 suffered from chronic pain, followed by depressive disorders; dementia patients from group 2 also had a high percentage of depression or chronic pain in addition to cognitive deficits. For detailed sample characteristics, see Table 1. Each group received 30-40 minutes of musical group therapy with boom whackers twice a week. Exclusion criteria for group participation were severe visual or hearing impairment and the patient's wish not to participate in the group. During the 2- to 3-week stay, patients participated in an average of 3 boom whacker sessions (minimum 1 hour, maximum 6 hours). In addition to simple rhythm exercises to get started (about the first 10 minutes of the session), several songs were rehearsed and played during the remaining hour (e.g., "Viel Glück und viel Segen" by Werner Gneist or "Ode to Joy" by Ludwig van Beethoven). All exercises and songs were pre-selected by investigator and interventionist, a psychologist who already has experience in using the boom whackers with young people. The content of the individual sessions was defined in advance and documented accordingly after implementation. The sessions were held in a quiet group therapy room in the day clinic with sufficient space and without disturbing background noise. The number of participants in the group was between 4 and 8. During the lesson, a structured behavioral observation was conducted to assess feasibility. This included the five-fold graded assessment (1=not at all to 5=extremely) of the following areas: Activity (active participation in the group, physical movements, emotional involvement, attention), music making (handling of instruments, sense of rhythm, improvisation, learning process), social behavior (towards fellow patients and experimenter) as well as conspicuousness (calling in between, leaving the room, etc.). In addition, all patients were asked before and after the lesson about their well-being (1=very well to 5=not well at all), and the patients from group 1 additionally provided information about their psychological symptoms (1=not present to 5=strong). In addition to descriptive analyses, t-tests, (M) ANOVAs, correlations, and regression analyses (95% confidence interval) were performed. The study was registered at the clinical study center in June 2021 and approved by the Institutional Review Board in September 2021 (SZ_W_077.21-XI-3). According to IRB there was no obligation to seek advice from an official ethics committee.

Results

In principle, it was feasible to make music with boom whackers in both groups. However, making music in group 1 with cognitively unimpaired patients proved to be much easier and less susceptible to interference. Patients with dementia from group

Table 1: Sample characteristics.

	Total (=47)		Group 1 (n=27)		Group 2 (n=20)	
	N(%)	M(SD)	N(%)	M(SD)	N(%)	M(SD)
Age		79.4(6.1)		79.3(7.4)		79.6(3.9)
Age group						
61-70	3(6.3)					
71-80	23(49.1)					
81-90	20(42.6)					
>90	1(2.1)					
Sex						
male	14(29.8)		4(14.8)		10(50)	
female	33(70.2)		23(85.2)		10(50)	
Instrumental music experience	9(19.19)		5(18.5)		4(20)	
Choir experience	10(21.3)		8(29.6)		2(10)	
Diagnoses						
Depression	23(48.9)		12(44.4)		11(55)	
Pain	25(53.2)		17(63)		8(40)	
Anxiety	4(8.5)		3(11.1)		1(5)	
Psych. other	13(27.7)		11(40.7)		2(10)	
Dementia	20(42,6)		0		20(100)	
MMSE		24.7(4.6)		27.7(1.6)		20.6(4.1)
GDS		5.4(4.1)		5.8(4.4)		5.0(3.7)
Barthel		87.1(13.1)		90.4(11)		82.8(14.5)

Notes: Psych. Other: Adjustment disorder, prolonged grief disorder etc.

Table 2: Results of one-way MANOVA.

Variable	Group 1 (n=27)		Group 2 (n=20)		F (4,45)	p
	M	SD	M	SD		
Activity	3.71	0.51	2.81	0.47	38,99	<.001
Music making	3.88	0.57	2.98	0.57	28,84	<.001
Social behavior	4.83	0.47	3.89	0.83	24,3	<.001
Conspicuousness	1.07	0.38	1.64	1.07	6,49	.014

Notes: Group 1=Mental Symptoms, Group 2=Dementia; M=Mean, SD=Standard Deviation, P=Significance; Likert Scale 1=Not At All, 2=A Little, 3=Rather, 4=Much, 5=Very Much.

Table 3: Results of dependent samples t-tests regarding well-being.

	Well-being				df	t	p	Cohens d
	Pre		Post					
	M	SD	M	SD				
Group 1 (n=27)	2.43	0.64	2.04	0.55	26	4.45	<.001	0.86
Group 2 (n=20)	2.76	0.76	2.54	0.83	19	1.24	.115	0.28

Notes: Group 1= Mental Symptoms, Group 2= Dementia; M=Mean, SD=Standard Deviation, P=Significance; Likert Scale of Well-Being 1=Very Well, 2=Somewath Well, 3=Neutral, 4=Not So Well, 5=Not Well at All.

Table 4: Results of dependent samples t-tests regarding psychological symptoms (n=27).

	Pre		Post		df	t	p	Cohens d
	M	SD	M	SD				
Depression	1.52	0.78	1.25	0.48	26	2.94	.003	0.57
Pain	2.04	0.95	1.81	0.94	26	2.75	.005	0.53
Anxiety	1.33	0.79	1.09	0.22	26	1.64	.057	0.32
Psych. other	1.58	0.7	1.35	0.64	26	1.89	.035	0.36

Notes: Likert scale 1=not present, 2=weak, 3=medium, 4=strong, 5=very strong; Psych. other e.g. restlessness, brooding.

Table 5: Results of regression analysis (n=47).

	Activity				Music making				Social behavior			
	b	SE b	β	p	b	SE b	β	p	b	SE b	β	p
Barthel Index	.008	.005	.152	.118	.006	.006	.115	.280	/	/	/	/
Number of sessions	.167	.045	.368	<.001	.172	.054	.350	.003	/	/	/	/
Music experience	.089	.157	.055	.573	.160	.189	.092	.400	/	/	/	/
Sex	.117	.150	.082	.439	.161	.181	.103	.379	.238	.221	.140	.278
Group	.750	.136	.564	<.001	.728	.164	.503	<.001	.851	.205	.539	<.001

Notes: b=Regression weights, SE b=Standard error of regression weights, β=Standardized regression weight, p=Significance.

2 required much more assistance, as they sometimes had difficulties following the procedure. There were also significant differences between the two groups in terms of activity, music-making, social behavior and conspicuousness (Table 2). Psychologically affected but cognitively unimpaired patients participated significantly more actively, showed better music-making skills, a higher degree of social interaction, and fewer behavioral problems during the lesson. If additionally considered how often patients participated in the music group during their stay, the significant difference between groups remained in the one-way MANOVA in the overall model ($F(4,41)=6.11, p<.001$, Pillai trace $V=.373$, Wilk's $\lambda=.627$), but frequency of participation had a positive effect on activity and music making.

Regarding the general well-being before and after the music session, both groups showed an improvement in the pre-post comparison, which only becomes significant in group 1, but this with a large effect, cf. (Table 3). In group 1, patients reported significantly less general psychological discomfort, less depressiveness, and less pain after the music lesson than before the music lesson; less anxiety was also reported, but this change does not become significant; (Table 4).

Since correlation analyses revealed relationships between sociodemographic variables and music making, activity, and social behavior, regression analyses were also performed, cf. (Table 5). Group membership (cognitively impaired vs. cognitively unimpaired and psychologically affected) had a significant influence on activity, music making, and social behavior: Patients without a dementia disorder had better scores. The number of music sessions also had an impact on activity and music playing; the more often patients participated, the better their scores. In contrast, gender, previous musical experience and the Barthel index as a measure of the need for care had no influence.

Discussion

The pilot study shows that playing music with boom whackers is also feasible in geriatric psychiatric patients. Initial reservations of the patients could be quickly reduced, both patients

with psychological impairment and patients with dementia enjoyed and actively participated in the music therapy intervention. However, it became clear during the study that cognitively impaired patients need more support, repetition and simple exercises in handling and rhythm; playing songs together also proved difficult in the group with dementia patients. However, by slightly adapting the group lessons (greater proportion of warm-up exercises, more repetitions, lower level of difficulty of the exercises, shorter duration of the group session), dementia patients were also able to participate in the program. The positive feedback from the patients clearly shows that even at an advanced age, new challenges are accepted with pleasure. In particular, the modern character of the boom whackers (“even my grandchildren don’t know that”) generated enthusiasm among the patients. Regular participation, if possible several times a week, also led to progress in handling and playing music, as well as higher activity among the participants, who were obviously happy about the increase in learning. Depressiveness and pain were significantly reduced after playing music, and anxiety symptoms were also diminished. This result is in line with previous findings on the influence of music therapy [8,5,7,25] but boom whackers have never been used in studies so far. Corresponding to the results of Creech et al. (2013), the general well-being improved significantly, which also reflects the impression during music playing and is supported by positive statements of the patients (“I can let myself go and forget all my worries”, “my soul rejoices”). The patients’ joy was clearly visible and noticeable. Because this was a pilot study in a naturalistic setting, the following limitations were unavoidable: With a relatively small sample size, unequal gender distribution (although typical for geriatrics), lack of randomization and control group, and simple pre-post design without recording long-term effects or effects on overall treatment success, the results can only be generalized to a limited extent. Nevertheless, our initial findings encourage the establishment of music therapy in geriatric psychiatric contexts, using boom whackers as innovative and easy-to-use instruments. In addition to the joy experienced, music making has direct effects on the patients’ well-

being and psychological state - a finding that should definitely be investigated in further studies (also in different contexts such as nursing homes and other institutions for old people). The boom whackers appear to be very well suited to expanding the range of instruments used in music therapy and to using them with older adults in addition to children and young people. They could help to establish music therapy services in psychiatry and geriatrics, particularly due to their ease of use without the need for prior knowledge. The authors hope and wish that geriatric psychiatric institutions will discover the boom whackers for themselves - and perhaps the manufacturer will also take the target group of the aged into consideration.

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