

COMPLEMENTARY ALTERNATIVE MEDICINE

Mild Asthmatics Benefit from Music Therapy

AGNIESZKA SLIWKA, PH.D.,¹ ROMAN NOWOBILSKI, PH.D.,^{1,2,*} ROMUALD POLCZYK, PH.D.,³
EWA NIZANKOWSKA-MOGILNICKA, M.D., PH.D.,⁴ AND ANDRZEJ SZCZEKLIK, M.D., PH.D.⁴

¹*Institute of Physiotherapy, Faculty of Health Sciences, Jagiellonian University School of Medicine, Cracow, Poland.*

²*Department of Allergy and Immunology, University Hospital, Cracow, Poland.*

³*Institute of Psychology, Jagiellonian University, Cracow, Poland.*

⁴*Department of Medicine, Jagiellonian University School of Medicine, Cracow, Poland.*

Objective. The aim of the study was to evaluate the effectiveness of pulmonary rehabilitation with music therapy in patients with asthma. **Methods.** Seventy-six selected inpatients (54 women and 22 men; mean age = 56.4 years; SD = 11.8) with stable asthma underwent pulmonary rehabilitation in two groups: standard versus music therapy. **Results.** After the intervention, an increase in analyzed spirometric values (forced expiratory volume at the first second (FEV₁), FEV₁ as a percentage of vital capacity (FEV₁ % FVC), forced expiratory flow at 25%, 50%, and 75% of vital capacity (FEF₂₅, FEF₅₀, and FEF₇₅, respectively), and peak expiratory flow) was observed in both the groups ($p < .05$) but without any intergroup differences ($p > .05$). A greater increase of mean FEV₁ % FVC, FEF₅₀, and FEF₇₅ values was observed only in the patients with mild asthma from the music therapy group ($p < .05$). In both the groups, a dyspnea reduction was noted ($p < .001$). However, it was influenced neither by the type of rehabilitation nor by the gender ($p > .05$), but the interaction of these variables was significant ($p = .044$). A dyspnea reduction was observed in women in both the groups ($p < .001$) and in men in the music therapy group only ($p = .001$). A change in the value of anxiety (6.43, SD = 7.73) on the 10th day compared with the first day of the study was noticed ($p < .001$). However, this change was not influenced by the type of rehabilitation, gender, or a combination of these two variables ($p > .05$). **Conclusion.** Music therapy improves the respiratory function in patients with mild asthma and reduces dyspnea mainly in men with asthma.

Keywords asthma, bronchoconstriction, gender, music therapy

INTRODUCTION

The factors that influence the risk of developing asthma include genetic predisposition (1), gender (2), and obesity (3). Among the factors reported to trigger the symptoms are strong emotions such as fear, anger, weeping, and laughter (4). The underlying mechanism is probably associated with hyperventilation, hypocapnia, and reduction of airflow (5). It is estimated that 30–60% of patients with severe asthma may have experienced anxiety and depressive disorders; their presence significantly worsens the quality of life (6, 7). The aim of asthma treatment is to achieve and maintain optimal disease control. To achieve this aim, the appropriate pharmacological treatment is often supplemented with pulmonary rehabilitation, which should also include education and psychotherapy. Data from several studies indicate the importance of psychosocial interventions in the form of various psychotherapy techniques, including relaxation (8, 9). One of the relaxation methods is passive music therapy. Its impact on the psychological state of patients hospitalized for various health conditions has been the subject of many studies of varying reliability (10–12). Several studies have described the use of passive or active music therapy in the treatment of patients with asthma (13, 14). Music therapy was also implemented as a relaxation method in patients with the

risk of an asthmatic attack preceding a scheduled surgery (15). It is well known that the costs of optimal asthma control seem to be relatively high, so it is important that asthma treatments are appropriate and effective (16).

The aim of the present study was to evaluate the effectiveness of pulmonary rehabilitation with passive music therapy in adult inpatients with asthma. We set up the hypothesis that pulmonary rehabilitation with passive music therapy influences the emotional state of patients with asthma, the symptomatology of the disease, and respiratory function more favorably than pulmonary rehabilitation without music therapy.

METHODS

Study Population

Seventy-six consecutive and selected adult inpatients with stable asthma (54 women and 22 men; mean age = 56.41 years, SD = 11.8) were subjected to pulmonary rehabilitation between February 2005 and July 2008. An assessment of the asthma severity was carried out by an experienced allergist and pulmonologist, based on the GINA Report (GINA, 2004) and is presented in Table 1. The patients enrolled in the study were hospitalized due to exacerbation and then, once in a clinically stable condition, underwent pulmonary rehabilitation in the pulmonary department for 10 days. Exclusion criteria were current smoking, acute ischemic heart disease, severe pulmonary hypertension, significant hepatic dysfunction, metastatic cancer, severe

*Corresponding author: Roman Nowobilski, Ph.D., Institute of Physiotherapy, Faculty of Health Sciences, Jagiellonian University School of Medicine, Skawińska 8, 31-066 Kraków, Poland; Tel: +48602742933; Fax: +48124305203; E-mail: nowreh@mp.pl

TABLE 1.—Patient characteristics by gender.

	Total	Women	Men	95% CI	<i>p</i>
<i>n</i>	76	54	22		
Age (years); $\bar{x}$ (SD)	56.4 (11.8)	56.8 (11.5)	55.6 (12.80)	(−4.80 to 7.18)	.69 ^a
Asthma duration (years); $\bar{x}$ (SD)	14.5 (13.30)	14.35 (13.75)	14.86 (12.45)	(−7.26 to 6.24)	.88 ^a
Asthma severity; <i>n</i> (%)				—	.48 ^b
II	11 (14.47%)	9 (16.6%)	2 (9.09%)		
III	21 (27.63%)	16 (29.63%)	5 (22.73%)		
IV	44 (57.89%)	29 (53.7%)	15 (68.18%)		
FEV ₁	61.45 (25.52)	63.45 (24.87)	56.53 (27.02)	−5.93 to 19.77	.29 ^a
PEF	62.61 (26.95)	64.69 (26.78)	57.5 (27.32)	−6.37 to 20.77	.29 ^a
Spirometric values (first day); $\bar{x}$ (SD)					
FEV ₁ % FVC	66.99 (13.30)	67.63 (13.80)	64.33 (11.87)	−3.79 to 11.18	.33 ^a
FEF ₂₅	44.14 (30.13)	46.57 (31.30)	35.7 (25.79)	−4.16 to 25.91	.15 ^a
FEF ₅₀	32.72 (21.87)	33.79 (22.48)	28.05 (20.22)	−5.28 to 16.76	.30 ^a
FEF ₇₅	29.63 (21.62)	31.21 (22.76)	24.02 (17.63)	−4.91 to 17.01	.19 ^a
Dyspnea (first day); $\bar{x}$ (SD)	3.29 (2.04)	3.5 (2.15)	2.77 (1.66)	−0.29 to 0.1.75	.16 ^a
Anxiety—state (first day); $\bar{x}$ (SD)	45.46 (11.4)	46.35 (10.70)	43.27 (12.95)	−2.66 to 8.82	.29 ^a
Anxiety—trait (first day); $\bar{x}$ (SD)	47.63 (9.65)	49.13 (8.26)	43.95 (11.86)	0.43 to 9.92	.03 ^a

Notes: CI, confidence interval; SD, standard deviation; FEV₁, forced expiratory volume at the first second; PEF, peak expiratory flow; FVC, forced vital capacity; FEF₂₅, forced expiratory flow at 25% of FVC; FEF₅₀, forced expiratory flow at 50% of FVC; FEF₇₅, forced expiratory flow at 75% of FVC. Values of spirometric parameters are shown as percentage of predicted value.

^a*p* based on Student's *t* test.

^b*p* based on χ^2 test.

cognitive impairment, and severe mental illness (based on the opinion of a psychiatrist) (17). All subjects gave written informed consent. The study design was approved by the local bioethics commission.

Urban residents dominated the study population, accounting for almost 70% of subjects. Nearly all patients (96%) lived with family; only three lived alone.

There were no differences in age ($p > .05$), average duration of disease ($p > .05$), or the distribution of asthma severity stages ($p = .48$) between women and men ($p > .05$). The detailed characteristics of the sample are presented in Table 1.

In all hospitalized patients, diagnostic and therapeutic procedures were performed according to the GINA Report guidelines (GINA, 2004). The natural experiment method was used, with a pre-test and a post-test of the variables measured in both groups. The demographic variables and the course of disease and therapy were obtained by means of structured history. Respiratory function tests were performed with MasterLab spirometer (Jaeger Company, Wiirzburg, Germany). The level of anxiety at the beginning of study, as well as the personality prone to anxiety reactions, was determined using the State and Trait Anxiety Inventory (18) forms X-1 and X-2. The intensity of declared dyspnea was estimated on a 10-point Borg scale (19). A table of random numbers (20) was used for the allocation of subjects to the experimental and control groups.

Statistical Analysis

The following statistical procedures were used: Student's *t*-test, χ^2 test of independence, and multivariate analysis of variance with repeated measurements.

The Design of the Study

On the first day of the program we performed a structured interview, spirometry, and the measurements of anxiety: state, trait, and dyspnea intensity. Two different pulmonary

rehabilitation programs were used: pulmonary rehabilitation with passive music therapy in the experimental group and pulmonary rehabilitation without music therapy (hereinafter referred to as standard rehabilitation) in the control group. The pulmonary rehabilitation program was carried out daily for 10 days (7 days a week) in the ward, before midday. The length of one session was, on average, 60 minutes (45 minutes of pulmonary rehabilitation and 15 minutes of music therapy) in the music therapy group and 45 minutes in the standard group. The pulmonary rehabilitation program included mechanical and manual chest physiotherapy techniques for increasing bronchial clearance (21). The sequence of pulmonary rehabilitation procedures was as follows: static postural drainage, mechanical vibration of chest wall using Senator Standard 3D made by Vibrax®, forced expiratory technique, directed cough exercises, controlled breathing exercises, diaphragmatic breathing, and low-cost breathing exercises (22–25).

Music therapy was carried out in accordance with the recommendations for individual passive music therapy after the pulmonary rehabilitation (26, 27). On the first day, after the completion of pulmonary rehabilitation treatments, patients selected the music from three proposed types: classical, jazz, and film. First they listened to the fragments of the proposed types. After making their choice, they listened again to the full program they had selected and were given the option to change their decision. The classical music compositions were as follows: “Andante, Divertimento in D major” by V. A. Mozart, “Air on the G String” by J. S. Bach, and “Adagio” by C. M. Weber. The tracks “Misty” and “On Rainy Afternoons” by Stan Getz and “Under a Painted Sky” by Chris Botti comprised the jazz repertoire. The film music included “It’s All about Love,” “Quartet in 4 Movements,” and “Mouvements du Desir” by Zbigniew Preisner. Subjects used a portable CD player (Sony, type DE206CK) with headphones.

RESULTS

Thirty-seven subjects were assigned to the experimental group and 39 to the control group. The detailed characteristics of both groups are shown in Table 2. No differences were found between the groups as regards the age ($p = .98$), asthma severity ($p = .79$), and education ($p = .23$). However, there were more women than men in the music therapy group ($p = .04$). More participants lived in city than in villages ($p = .01$). Structure of education in the study was as follows: higher—21.05%; secondary—48.68%; vocational education—17.11%; elementary—3.16%. The duration of disease was longer in the standard group ($p = .05$). There were no differences in measured values of spirometric parameters obtained on the first day of pulmonary rehabilitation in groups of men and women ($p > .001$). Women reported higher values of personality prone to anxiety than did men ($p < .05$). Differences between sexes were tested by t tests, except in the case of asthma severity, place of living, and education, which were tested by χ^2 test.

After the intervention, an increase was observed in forced expiratory volume at the first second (FEV₁), peak expiratory flow (PEF), forced expiratory flow at 25%, 50%, and 75% of vital capacity (FEF₂₅, FEF₅₀, and FEF₇₅, respectively), and FEV₁ as a percentage of forced vital capacity (FEV₁ % FVC; $p < .05$) but without intergroup differences ($p > .05$). For women undergoing passive music therapy, the mean value of PEF measured on the 10th day of the study was higher than that for

women in the standard group ($p = .03$). In order to expand our analysis, we performed ANOVA with repeated measures, testing the interaction of the change of spirometric parameters, the type of pulmonary rehabilitation, and asthma severity. In view of the significant changes in spirometric variables, such as FEV₁ % FVC, FEF₅₀, and FEF₇₅, detailed analysis was performed. Analysis of the variance showed a significant increase in the average values of FEV₁ % FVC, FEF₅₀, and FEF₇₅ on the 10th day of study in patients with mild asthma included within the music therapy group (Table 3, Figures 1–3). In other groups of asthma severity (III and IV), increases in spirometric values were present but were not significant ($p > .05$).

A significant change in the intensity of dyspnea between the 1st and the 10th day ($p < .01$) was observed. The rate of this change was not affected by the type of rehabilitation or gender of subjects ($p > .05$), but it was influenced by the combination of these two variables ($p = .04$). The simple effects tests were used to check the difference in dyspnea severity in the music therapy group and the standard rehabilitation group of women and men, on the 1st and 10th days of the study. The effectiveness of therapy manifested by a decrease in dyspnea was observed among women in both groups ($p < .01$), but for men, it was observed only in the music therapy group ($p = .001$). Then, simple effects tests were used to check the differences in the intensity of dyspnea in both groups of women and men on the 1st and 10th days of the study. There were no differences ($p > .05$) in this variable.

TABLE 2.—Clinical characteristic of subjects enrolled to the music therapy and standard rehabilitation groups.

		Total	Music therapy	Standard	95% CI	p
n (%)		76	37 (48.68%)	39 (51.32%)		
Gender: women/men		54/22	28/9	26/13		.04 ^a
Age (years); $\bar{x}$ (SD)		56.4 (11.80)	56.4 (12.00)	56.5 (11.80)	−5.50 to 5.39	.98 ^a
Asthma duration (years); $\bar{x}$ (SD)		14.5 (13.30)	11.4 (11.40)	17.4 (14.40)	−11.99 to −0.07	.05 ^a
Asthma severity; n (%)	II	11 (14.47%)	6 (16.22%)	5 (12.82%)	—	.79 ^b
	III	21 (27.63%)	9 (24.32%)	12 (30.77%)		
	IV	44 (57.89%)	22 (59.46%)	22 (56.41%)		
Spirometric values (first day); $\bar{x}$ (SD)	FEV ₁	61.45 (25.52)	61.62 (25.09)	61.29 (26.25)	11.41 to 12.09	.96 ^a
	PEF	62.61 (26.95)	62.72 (11.29)	62.51 (24.80)	−12.19 to 12.62	.97 ^a
	FEV ₁ % FVC	66.99 (13.30)	66.44 (9.99)	66.89 (15.91)	−6.57 to 5.66	.88 ^a
	FEF ₂₅	44.14 (30.13)	44.34 (31.08)	42.55 (29.42)	−12.05 to 15.61	.79 ^a
	FEF ₅₀	32.72 (21.87)	32.96 (22.33)	31.34 (21.70)	−8.45 to 11.68	.75 ^a
	FEF ₇₅	29.63 (21.62)	28.40 (16.94)	30.60 (25.21)	−12.11 to 7.72	.66 ^a
Dyspnea (first day); $\bar{x}$ (SD)		3.29 (2.04)	3.54 (2.01)	3.05 (2.06)	−0.44 to 1.42	.30 ^a
Anxiety—state (first day); $\bar{x}$ (SD)		45.46 (11.40)	46.62 (11.29)	44.36 (11.53)	−2.96 to 7.48	.39
Anxiety—trait; $\bar{x}$ (SD)		47.63 (9.65)	49.70 (8.66)	45.67 (10.22)	−0.31 to 8.38	.07
Spirometric values (10th day); $\bar{x}$ (SD)	FEV ₁ ($p^3 < .01$)	73.29 (29.04)	77.14 (30.33)	69.63 (27.66)	−5.74 to 20.77	.26 ^a
	PEF ($p^3 < .01$)	76.55 (30.38)	81.85 (31.26)	71.51 (29.03)	−3.44 to 24.12	.14 ^a
	FEV ₁ % FVC ($p^3 = .02$)	69.76 (14.76)	72.01 (14.58)	67.63 (14.81)	−2.44 to 11.19	.21 ^a
	FEF ₂₅ ($p^3 < .01$)	51.77 (30.03)	56.47 (32.14)	47.32 (27.58)	−4.71 to 23.00	.19 ^a
	FEF ₅₀ ($p^3 < .01$)	42.78 (33.25)	47.61 (39.71)	38.20 (25.40)	−5.96 to 24.77	.23 ^a
	FEF ₇₅ ($p^3 < .01$)	39.45 (30.47)	42.94 (37.14)	36.15 (22.45)	−7.96 to 20.64	.38 ^a
Dyspnea (10th day); $\bar{x}$ (SD)	$p^3 < .01$	1.82 (1.62)	2.05 (1.75)	1.59 (1.48)	−0.27 to 1.20	.22 ^a
Anxiety—state (10th day); $\bar{x}$ (SD)	$p^3 < .01$	39.03 (11.48)	39.49 (10.99)	38.59 (12.05)	−4.38 to 6.18	.74 ^a

Notes: CI, confidence intervals for the difference between standard and music therapy rehabilitation (numeric variables only); p^3 , the difference between the 1st and 10th day (repeated measures ANOVA); SD, standard deviation; FEV₁, forced expiratory volume in the first second; FVC, forced vital capacity; FEF₂₅, forced expiratory flow at 25% of FVC; FEF₅₀, forced expiratory flow at 50% of FVC; FEF₇₅, forced expiratory flow at 75% of FVC; PEF, peak expiratory flow. Values of spirometric parameters are shown as percentage of predicted value.

^a p based on Student's t -test.

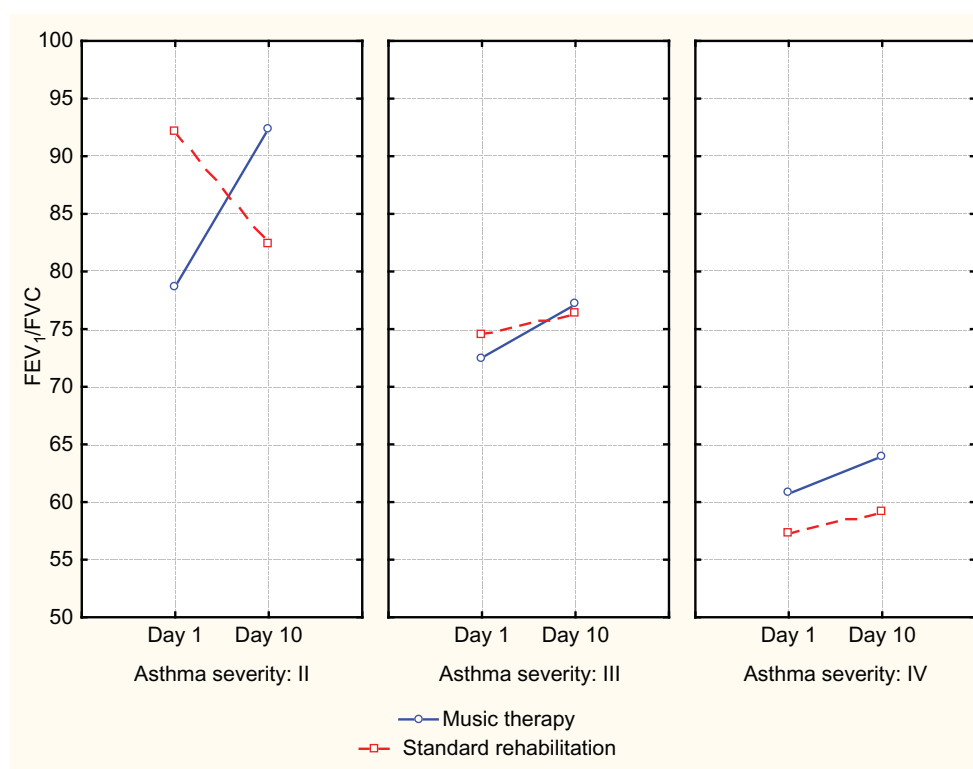
^b p based on χ^2 test.

TABLE 3.—Differences between standard and music therapy groups on the 1st and the 10th day for all levels of asthma severity.

Asthma severity	Day	Music therapy $\bar{x}$ (SD) (<i>n</i>)	Standard $\bar{x}$ (SD) (<i>n</i>)	95% CI	p^1	p^2	p^3
FEV ₁ % FVC							
II	1	78.69 (4.64) (6)	92.04 (13.70) (5)	−23.87 to −2.83	.01	<.01	.02
	10	92.43 (17.51) (6)	82.31 (20.41) (5)	−2.95 to 23.19	.13		
III	1	72.53 (6.04) (9)	74.60 (6.68) (12)	−9.73 to 5.59	.59	.15	.52
	10	77.14 (4.86) (9)	76.37 (7.63) (12)	−8.75 to 10.29	.87		
IV	1	60.72 (7.77) (21)	57.24 (10.74) (21)	−1.89 to 8.83	.20	.12	.36
	10	63.97 (9.02) (21)	59.14 (10.72) (21)	−1.83 to 11.48	.15		
FEF ₅₀							
II	1	75.17 (14.57) (6)	71.86 (6.80) (5)	−6.75 to 13.36	.51	<.01	.42
	10	115.88 (48.71) (6)	64.80 (26.07) (5)	25.09 to 77.08	<.01		
III	1	38.70 (5.80) (9)	43.95 (7.80) (12)	−12.57 to 2.07	.16	.05	.17
	10	51.87 (12.63) (9)	51.75 (15.52) (12)	−18.81 to 19.05	.99		
IV	1	19.54 (8.11) (21)	15.46 (7.78) (21)	−1.04 to 9.21	.12	.12	.05
	10	26.27 (14.76) (21)	24.13 (20.75) (21)	−11.10 to 15.39	.75		
FEF ₇₅							
II	1	53.55 (13.84) (6)	82.76 (21.03) (5)	−43.44 to 14.98	<.01	<.01	.11
	10	99.18 (51.85) (6)	64.02 (31.18) (5)	8.24–62.08	.01		
III	1	32.47 (15.82) (9)	35.82 (9.76) (12)	−13.71 to 7.01	.52	.09	.21
	10	47.30 (14.19) (9)	45.11 (14.86) (12)	−17.41 to 21.79	.82		
IV	1	20.36 (9.31) (21)	15.36 (9.67) (20)	−2.34 to 12.34	.18	.41	.11
	10	25.00 (19.11) (21)	24.63 (15.49) (20)	−13.52 to 14.26	.96		

Notes: SD, standard deviation; CI, confidence intervals; FEV₁, forced expiratory volume in the first second; FVC, forced vital capacity; FEF₅₀, forced expiratory flow at 50% of FVC; FEF₇₅, forced expiratory flow at 75% of FVC.

p^1 : the difference between music therapy and standard groups; p^2 : the difference between the 1st and the 10th day of therapy in the music therapy group; p^3 : the difference between the 1st and the 10th day of therapy in the standard therapy group. All p s are calculated by means of the planned comparisons from the three-way analysis of variance. values in bold are for $p \leq 0.01$.

FIGURE 1.— Δ FEF₁ % FVC in the music therapy and standard groups on the 1st and 10th days, with respect to asthma severity.

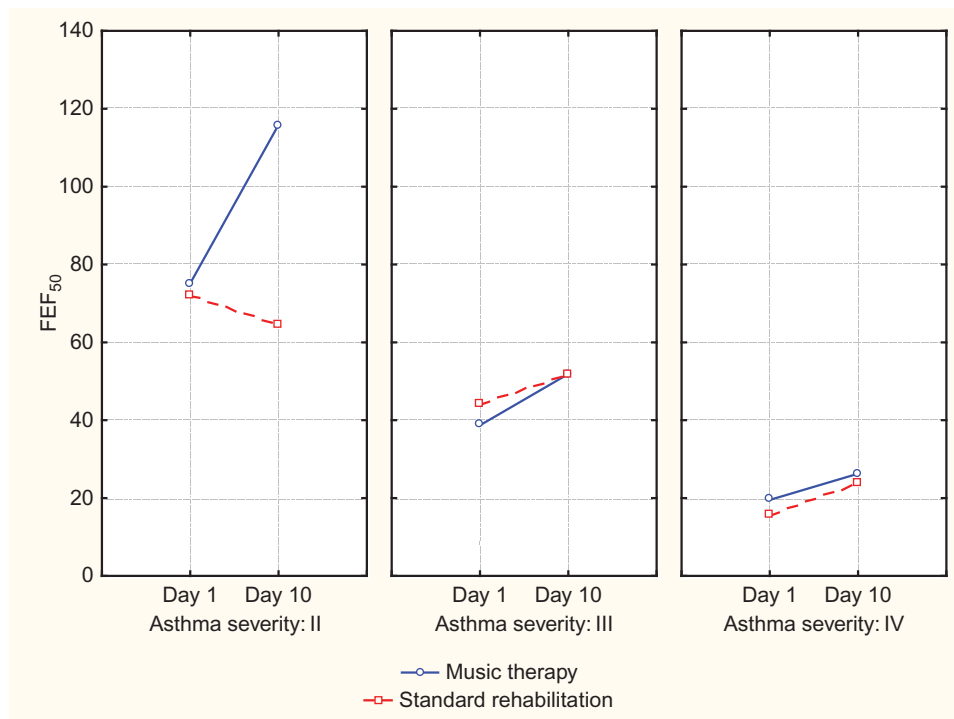


FIGURE 2.— ΔFEF_{50} in the music therapy and standard groups on the 1st and 10th day, with respect to asthma severity.

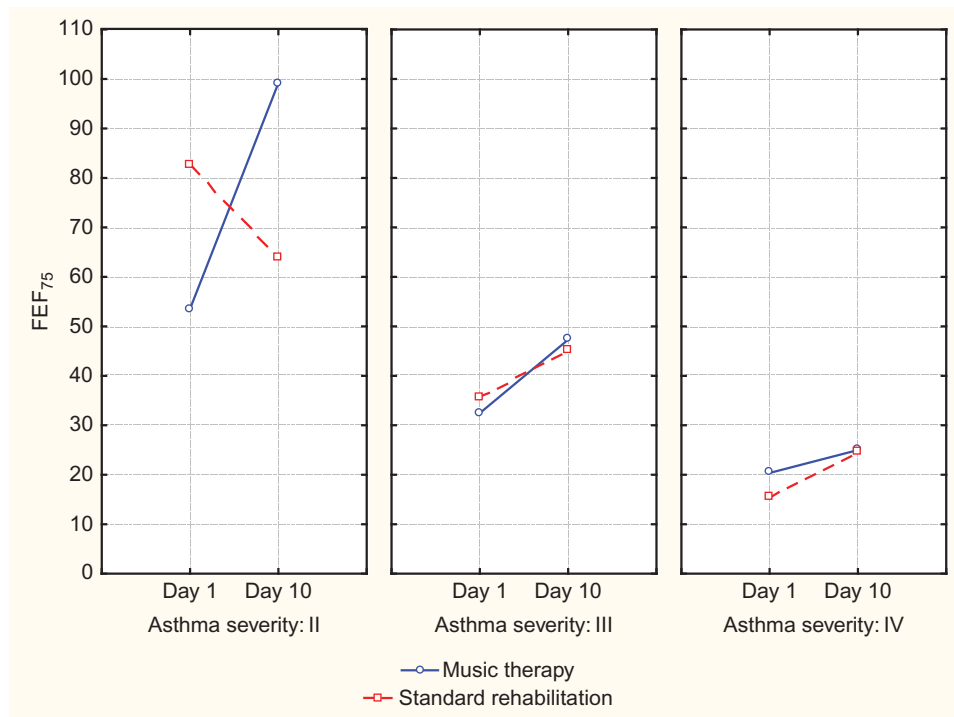


FIGURE 3.— ΔFEF_{75} in the music therapy and standard groups on the 1st and the 10th day, with respect to asthma severity.

A change in the average value of anxiety (total = 6.43, SD = 7.74) on the 10th day compared with the first day ($p < .01$) was observed. However, it was not affected by the type of rehabilitation, gender, or a combination of these two variables ($p > .05$).

DISCUSSION

In our study, the intensity of dyspnea decreased in women regardless of the type of rehabilitation, whereas in men a significant decrease was noted only in the music therapy

group. Music therapy decreased bronchial obstruction in patients with mild persistent asthma. This effect was not observed at other levels of asthma severity. Music therapy was also associated with significantly higher PEF values in women measured on the 10th day of the study.

The evaluation of the effectiveness of single applied treatments in pulmonary rehabilitation is difficult (22, 28) because of asthma specificity, including the multifactorial conditioning of the disease, and the interdisciplinary treatment process (29). The Cochrane Database provides a review of few valid and methodologically reliable publications in this area (22). The improvement after rehabilitation, described in these studies, concerned the airway functional status, the intensity of treatment, and the quality of life. BTS Guidelines indicate sporadic use of relaxation techniques, such as progressive muscle relaxation, mental relaxation, desensitization and electromyography (EMG) biofeedback-assisted relaxation, music-based relaxation, functional relaxation, and autogenic training (30). In the guidelines, we could find research by Loew et al. (9), which confirmed the effect of relaxation techniques in reducing bronchoconstriction of the small bronchi, which is consistent with the result of our study. Some of the current studies describe the multidisciplinary treatment in asthma including not only relaxation techniques but also pulmonary rehabilitation (31). Holloway's results confirm the belief that disease severity is not only dependent on the state of the respiratory system, and moreover, the connection of breathing exercises with relaxation may contribute to achieving the desired results. Bruton and Thomas also pointed out that the relaxing effects of breathing exercises by themselves, by correcting the breathing pattern, may contribute to the reduction of emotional tension (29). This implies consideration of the validity of incorporating relaxation techniques in the treatment of patients with asthma, with a detailed clarification of the possible target group.

Both in our present and previous studies, in addition to pharmacotherapy and passive music therapy, patients also participated in programs of pulmonary rehabilitation (14). The treatment program implemented and enforced in the hospital's regime mostly led to an improvement in disease symptomatology. It is therefore necessary to consider the impact of the following: the mere fact of being in hospital; daily contact with the specialist medical staff, which provides a sense of being taken care of (32); and better disease control of both physical and psychological symptoms (33). Our patients were hospitalized for minimum 10 consecutive days, so we can expect that this time was long enough to induce that kind of feeling. On the other hand, this long hospitalization duration was the reason for the 3-year observation period necessary to recruit enough subjects for our study.

More often, in studies conducted on the hospitalized patients, the authors mention a nonspecific, positive therapeutic factor, namely the interest and attention of medical staff (34). The positive effect of placebos on the objective clinical measurements related to the course of asthma was

also demonstrated (35). Sham therapy caused a significant increase of FEV₁ values in patients with asthma. Thus, the importance of hospitalization should be taken into consideration when discussing the results of our study.

We have shown a significantly greater reduction of airflow obstruction in patients with mild asthma who listened to music and increased values of PEF in women undergoing music therapy. Overall, although this research provided some arguments that music therapy may be beneficial for mildly severe group of patients, the results should be treated with caution because of the relatively low number of participants, the values of standard deviations, and the opposing direction of responses in the standard treatment group. In other studies evaluating the effectiveness of relaxation methods used in patients with chronic diseases, including patients with asthma, music therapy demonstrated superiority over other methods of relaxation, including progressive muscle relaxation (36). In our experience, the single session of music therapy for inpatients with asthma may last about 15 minutes and be applied after chest physiotherapy for 10 consecutive days.

Patients with asthma have difficulties in expressing and describing feelings or emotions, following life-threatening conditions (37). A change in coping strategy with increasing disease severity has also been noted. Patients with a more severe disease stage tend to clam up more often, suppress feelings, and use coping strategies focused on the emotions associated with a worse perception of health status (38). Perhaps in our study, this style of coping with the disease determined the reception of music by patients with severe asthma. In our study, a reduction in the intensity of dyspnea was seen only in those men who were in the music therapy group. According to Emerman and Cydulka (39), men with asthma are less likely to report severe symptoms of the disease. However, Nowobilski et al. showed that the severity of dyspnea reported by men with asthma may depend on personality-conditioned anxiety dispositions. If these dispositions are strong, with a prolonged disease duration, the severity of dyspnea in asthmatic men increases (7). The correlation between the severity of dyspnea and the level of depression in patients with asthma, regardless of their gender, was also noted. Tovt-Korshynska et al. add that men with asthma do not report depressive symptoms until they are at a severe disease stage and under long-term treatment, whereas women report at an earlier stage of the disease (40). In view of the stated correlation between the intensity of depression and shortness of breath, an analogy should be expected in reporting a subjectively perceived lack of air by women and men (7).

Worthy of mentioning are also the differences in the psychological profile of women and men, which are important for the conditioning of dyspnea. Kessler et al. (41), conducting psychiatric population research, found a greater risk of anxiety disorders and depression in women. This relationship was confirmed by our own study indicating higher levels of anxiety in women. Women do not get ill more often and more severely than do men, but have a different approach to reporting somatic symptoms. The

effects of psychological variables may decide how patients with asthma report and describe somatic symptoms and perhaps may also be an explanation as to why music therapy contributed to the reduction of dyspnea only in men.

The effectiveness of music therapy in men was described by Hayes et al. and Young et al. showing its beneficial and additive influence in men undergoing colonoscopy or urological surgery (42, 43). At the same time, numerous publications related to the beneficial effect of music therapy in women can be found in various fields, including obstetrics (12), surgery (44), gynecological examinations (45), parity (46), mastectomy (47), and the treatment of addiction (48). These studies reveal that women listening to music, when compared with those who do not, have significantly lower anxiety levels, as well as higher levels of satisfaction.

CONCLUSIONS

Improvement in pulmonary function and decrease in dyspnea intensity observed in our study support the use of music therapy in patients with asthma.

Music therapy seems to be an effective method of relaxation, particularly for adult inpatients with mild asthma, especially for men.

DECLARATION OF INTEREST

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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