

Research article

Dance as Moderate Intensity Activity in the Stress Management among Teenage Girls

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Abstract

Health benefits of physical activities are widely demonstrated in the relevant literature. It is also known, that adolescence period plays a decisive role in life, both in terms of health status and of integration of movement culture. Furthermore we know from various researches that teenagers are already experiencing stress and other psychosomatic symptoms, especially girls. Because of these, examining the health status of teenagers and finding out how to strengthen it successfully by physical activities is an important research area. A Swedish research team developed a dance intervention programme against stress and psychosomatic symptoms, and found increased self-rated health and self-trust impressive evidences. The article in hand presents the adaptation of that model on adolescent girls in Hungary and its main results.

Keywords: physical activity, mental health, dance, stress management

Introduction

The physical and psychological health of the young generation is very important to determine healthy adults. The adolescence is a period of significant cognitive, social and behavioural transactions with higher prevalence of mental health problems, especially among girls [1]. Adolescent girls are more exposed to mental health problems and strains, to impaired functioning, associated with distress, symptoms, and diagnosable mental disorders and to non-communicable diseases (NCDs) [23]. They are more exposed to interpersonal stress, and are more sensitive to the reactions of significant others [2]. Human movements are substantial tools for reducing stress and other mental disorders and also somatic symptoms [3]. Health benefits of physical activity are widely demonstrated also among adolescents [4-6]. Especially dance can be suggested due to its positive effects on increasing psychological wellbeing [24], improving poor body image and strengthening physical self-perception [7, 8].

Despite the abovementioned health benefits, studies have shown that the reduction of physical activity both for girls and boys is significant during adolescence, and the decline among girls begins in early adolescence [9-11]. Therefore, adolescent girls became the key target population for more intervention projects [12] inter alia using dance as a form of activity [13, 14] and also as a form of movement therapy method (DMT) [15, 16]. We had the chance to get to know the work of a Swedish research team regarding adolescent girls with internalizing problems. They developed a dance intervention programme against stress and psychosomatic symptoms, and found impres-

sive evidence in a randomized controlled trial for the efficacy of the method [17-19] [24]. The current research project aimed to culturally adapt the Swedish “Dance project” and investigate the efficacy of the intervention on a sample of Hungarian adolescent girls, with particular attention on the improvement of their self-rated health (SRH).

Research Design**Research question**

The question of the research is, how the Swedish “Dance project” can affect the self-rated health and the subjective well-being, with special regard to the feeling of stress, of adolescent girls in Hungary.

Our questions were:

- Can dance intervention with relaxation techniques be used as a non-medicated treatment for stress management?
- Can dance intervention with relaxation techniques significantly improve self-rated health?
- Can dance intervention with relaxation techniques have a positive effect on relieving psychosomatic symptoms?

Research method

Experimental research, based on an Experimental Group (EG) receiving intervention and a Control Group (CG) not receiving intervention, was conducted on a randomized sample, using self-completed questionnaires in paper-pencil form to measure the effects of the intervention that is the “Dance

project". The eight weeks long experiment started with the same questionnaires for both the experimental and the control group. After data collection it continued with the intervention, a weekly dance class based on the Swedish "Dance project" for the members of the experimental group, while the members of the control group were on common PE lessons. The process ended with the same questionnaires again for the two groups. The members of the sample were 13-14 year old girls.

Five primary schools in Budapest, Hungary were invited of which three primary schools joined the research, participated in the recruitment with sharing information, and provided place for the intervention and for the data collection - regarding the opportunity on free dance classes. Participants were recruited into the experiment according to the date of the consultation. The enrolment was approved by two independent researchers, girls with a BMI ≥ 18 kg/m² and ≤ 38 kg/m², and without any significant impairments relevant to their habitual/general physical activities were involved. The first 100 consecutive eligible volunteers were enrolled and randomized into the experimental group (n=49, one girl declined to participate after randomization) and the control group (n=50), irrespectively of their current health status or dancing skills. Randomization was performed by an external statistician using a random number generator.

The experiment was carried out from March 2017 till June 2017 in shift. The dance intervention took place in the schools' gym twice a week replacing ordinary PE classes in 45 minutes intervals.

Intervention program

The intervention method is a combination of peer support, movement therapy and art therapy. The eight-week long program provided classes twice a week consisting a 30-minute long instructed dance session (5 minutes warm-up, 15 minutes dance practice, 5 minutes stretching and 5 minutes relaxation) followed by a 15-minute long reflection and free interaction session. Several different dance and movement types were integrated based on the creative choreographies and ideas of the girls, while popular music was presented also following the girls' suggestions. The program provided physical, mental and emotional advices as well for the participant girls in order to prevent stress diseases. The main characteristics of the dance intervention were: the free, non-judgmental and non-competitive environment, the positive focus, the importance of strengthening the individual resources and autonomy of the participants and the importance of enhancing body awareness of them as well.

The dance classes were held by one of the authors of this article, having completed medical education and having accurate knowledge of the above mentioned Swedish dance programme and method.

Ethical approval

The study was reviewed and approved by the University of Pécs, Regional and Local Research Ethics Committee (Nr. 6617). Written informed consents were provided to the members prior the initiation of any study-related procedures, to accept by signature, to participate the research. Because of the

the age of the participants (13-14 year old students), the written informed consents were also signed by the parents. The investigation conforms to the principles outlined in the Declaration of Helsinki.

Data collection

To compare the experimental group and the control group, and to measure the changes of the two groups between the two dates (the before and after intervention dates), participants had to complete a questionnaire with 27 questions. The questionnaire was designed to measure physical condition, health condition, subjective health condition, subjective well-being, healthy and unhealthy habits and other circumstances of the respondents. Due to the pre test-post test design, the changes on every field could be measured. Due to the experimental group and control group design, the changes that occurred in the experimental group, but not in the control group, could be considered as results of the eight-week long dance therapy treatment.

To examine the above mentioned fields, in the questionnaire we focused on personal physical characteristics, psychosomatic symptoms, emotional distress, self-rated health, lifestyle, family, friends, school, interests, leisure time, sleep, and how respondents enjoy dance. The main focus was on SRH and on psychosomatic symptoms.

Because of its validity and reliability [20] and also its strong characteristic of prediction on physical health status of adolescents [21], the Self-rated health (SRH) was measured by a single-item question ("How do you rate your health in general?") and scored by a five-level Likert Scale (1 "very poor"; 2 "poor"; 3 "neither good nor poor"; 4 "good"; 5 "very good"). SRH compared to the own age peers was measured by a similar single-item question ("How do you rate your health compared to others in your age?") and scored again by the same five-level scale. Related to these questions we asked adolescents about their stress feelings ("How stressful do you feel yourself in everyday life?") as well.

We measured lifestyle with a question contained nine stress-relieving substances (e.g. coffee, cigarette, alcoholic drinks, narcotics or medicines), asking about the frequency of their use. The psychosomatic (physical and mental) symptoms were measured by a twelve-item question about the presence of various pains (e.g. headache or gripes) and of other physical or mental symptoms (e.g. dizziness, fatigue, nervousness, sadness, anxiety or stress). Respondents could mark their answers in a seven-level scale (from "never" till "many times a day").

Data analysis

Statistical analyses were performed using SPSS 22.0 software (SPSS Inc., Chicago, IL, USA). Normality of data distribution was tested by Kolmogorov-Smirnov test. For the analysis of the variables descriptive statistics (e.g. mean, standard deviation, frequency, minimum, maximum, median, modus) were applied, for the comparison of the two groups (the experimental group and the control group) and of the two dates (before intervention and after intervention) statistical tests were calculated (e.g. Mann-Whitney U-test, chi square test or Fisher's exact test). The conventional significance level was used in each case - we considered the differences significant at $p < 0.05$.

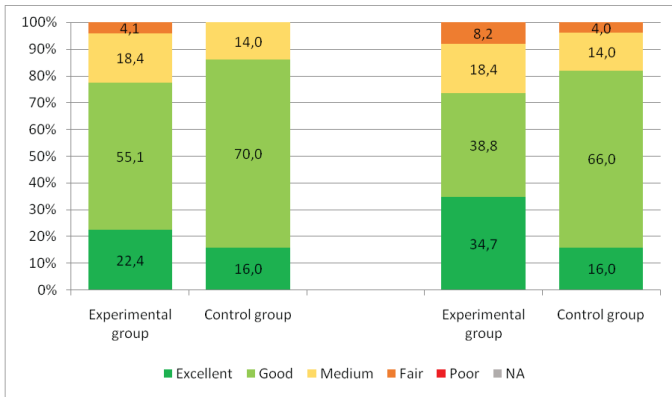


Figure 1. SRH and SRH compared to own age groups-before intervention (%)

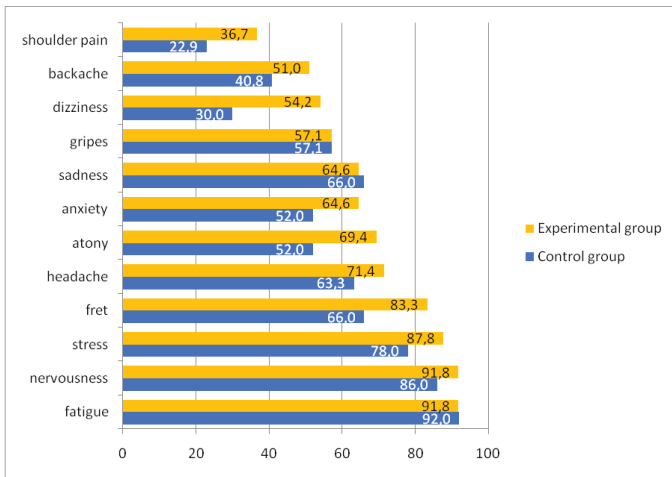


Figure 3. Subjective experience of psychosomatic symptoms before intervention (the proportion of adolescents experience the given psychosomatic symptom "many times a day" / "daily" / "several times a week" / "weekly" / "every 2 or 3 weeks", %)

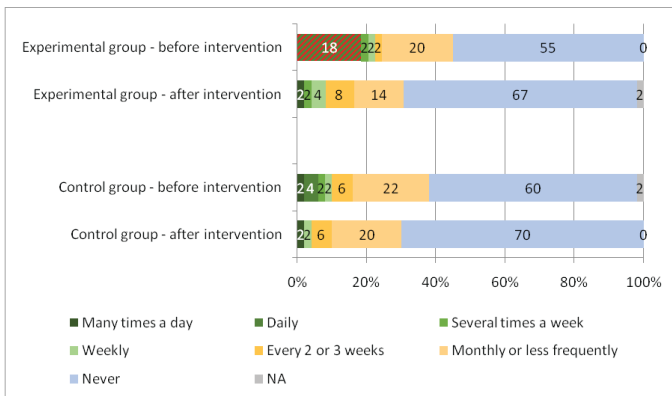


Figure 5. Using natural active substances before and after intervention (%)

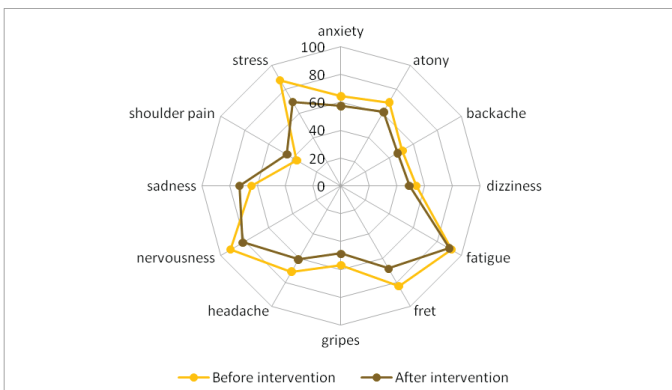


Figure 7. Subjective experience of psychosomatic symptoms in the experimental group before and after intervention (the proportion of adolescents experience the given psychosomatic symptom "many times a day" / "daily" / "several times a week" / "weekly" / "every 2 or 3 weeks", %).

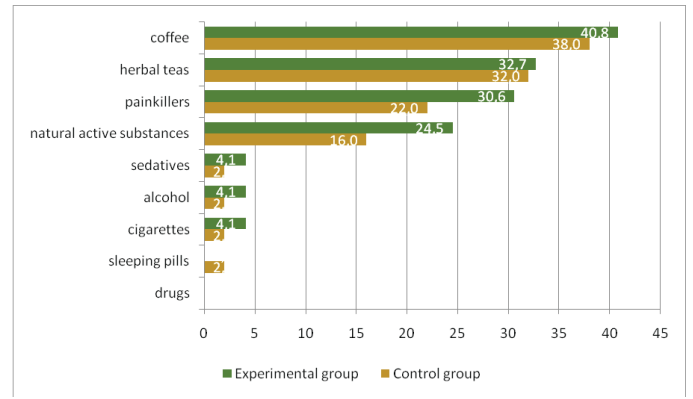


Figure 2. Using stress-relieving substances before intervention (adolescents using the given substance "many times a day" / "daily" / "several times a week" / "weekly" / "every 2 or 3 weeks", %)

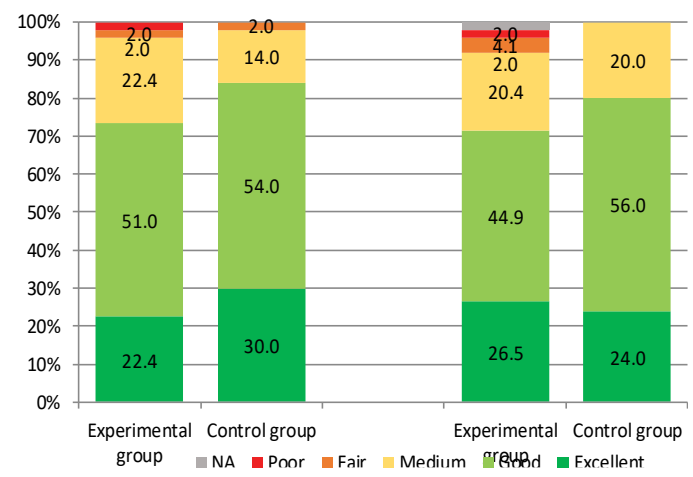


Figure 4. SRH and SRH compared to own age groups-after intervention (%)

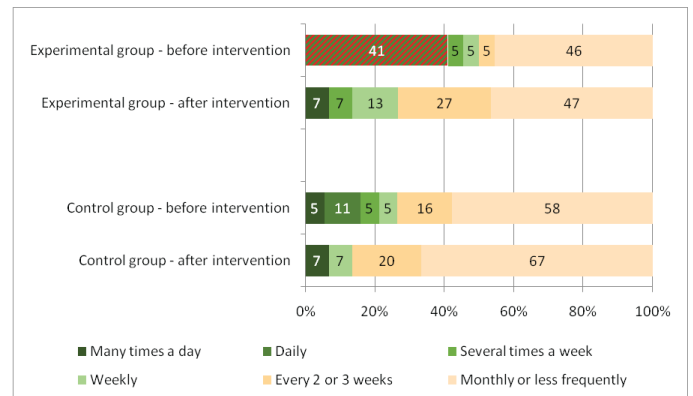


Figure 6. Using natural active substances (among the users of this substance) before and after intervention (%)

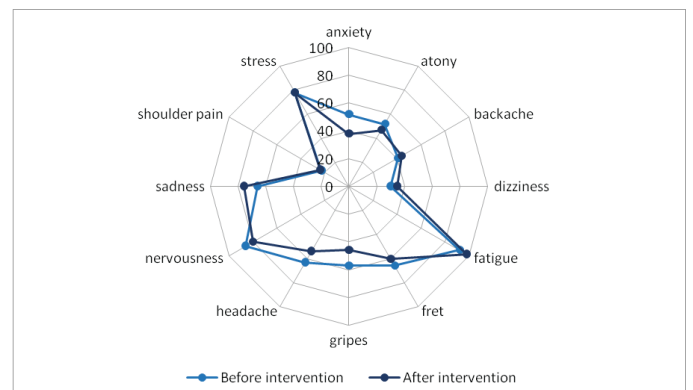


Figure 8. Subjective experience of psychosomatic symptoms in the control group before and after intervention (the proportion of adolescents experience the given psychosomatic symptom "many times a day" / "daily" / "several times a week" / "weekly" / "every 2 or 3 weeks", %).

Results

General characteristics

The major personal physical characteristics of the sample are presented in Table 1. Finally, a total of 99 participants were included, 49 of them were randomised into the experimental group and 50 into the control group. No statistically significant difference was found between the two groups with respect to age ($p>0.05$) and anthropometric characteristics, like weight, height and BMI-index ($p>0.05$). Regarding BMI, participants showed normal values following WHO categories [22] with as light deviation to underweight.

Table 1. Personal physical characteristics

	Experimental group	Control group	Total
N	49	50	99
Age [years] (mean)	13,7	13,6	13,7
Weight [kg] (mean)	52,7	51,9	52,3
Height [cm] (mean)	164,1	163,6	163,8
BMI-index [kg/m ²](mean)	19,5	19,4	19,4

Beyond the similarities of the physical characteristics of the members in the two groups, adolescents of the experimental and of the control groups are also similar (differed not significantly) with respect to other tested general characteristics, like school results, bonding with parents, bonding with friends or sleeping habits. Examining many aspects of general characteristics and habits, in only two did we find significant differences between the two groups. In the experimental group there are a higher proportion of those who almost always wakes up relaxed (14.3%) than in the control group (0%) ($p=0.03$). In the control group there are a higher proportion of those who has regular leisure time activity (98%) than in the experimental group (83.7%) ($p=0.016$). Overall (despite the smaller differences) the two groups are very similar in terms of basic characteristics.

Before intervention results

Girls in both groups are rather positive and optimistic regarding their future (EG: 59.2%; CG: 64%), while opinions of the two groups differ not significantly. They feel rather strong influence on mastering their own life, although influencing factors outside of them were also considered. The averages of given answers differed not significantly between the two groups, 7.02 by EG and 6.58 by CG ($p>0.05$) – where answers more closely to ten mean stronger ability to influence life. Overstress showed lower results, 5.96 for EG and 4.44 for CG – where answers more closely to ten mean less loading with stress. Means of both groups are around average 5, and are showing the presence of stress of adolescent girls in everyday life, however means differ not significantly again.

No significant difference was found between the two means and the two distributions regarding self-rated health (SRH) of the two groups. Most of the adolescent girls rated their own health “good” or “excellent”: 77.5% of the members of the experimental group and 86% of the members of the control group (the difference is not significant) - as can be seen in Table 2. In comparison with age peers, the means of the groups differ not significantly again, however distribution among categories

has significant differences: 34.7% of EG and less than half of it, 16% of CG feel “excellent”, while 38.8% of EG and a higher rate of 66% of CG feel “good” compared to the own age group. Merging respondents in the two higher ratings (“good” and “excellent”) clears the significant difference away.

As in the case of basic characteristics, the members of the two groups are similar according to their picture of themselves as well. Using stress-relieving substances (e.g. coffee, cigarette, alcoholic drinks, drugs, natural active substances, herbal teas or medicines like painkillers, sedatives, sleeping pills) by the adolescents were also asked, but there were no significant differences between the two groups regarding the 9 asked items. Half of the listed substances are used rarely or never (sedatives, alcohol, cigarettes, sleeping pills and drugs), while coffee, herbal teas, painkillers and natural active substances are used at least in every 2 or 3 weeks by interpretable proportion of the respondents. 40.8% of EG and 38% of CG drinks coffee, while 24.5% of EG and 16% of CG takes natural active substances in, at least several times a month – as can be seen on Table 3. However the difference is not significant in either case between the two groups.

Regarding subjective experience of twelve psychosomatic symptoms statistically significant difference was only found in case of dizziness. Girls from the experimental group experienced almost two times more regularly dizziness, than their controls as shown in Table 4. Other significant differences weren't found between the two groups with respect to the remainder eleven symptoms, although most of the listed symptoms were experienced regularly by a bit (but not significantly) higher proportion of the experimental group, than of the control group. In both groups mental symptoms (e.g. nervousness, stress or fret) and symptoms related to overloaded life (e.g. fatigue or atony) are more common than physical ones (e.g. shoulder pain or backache).

The two groups in general were quite similar at the beginning of the research. There were no significant differences between EG and CG regarding the main aspects, which make the control group, receiving no intervention, suitable to be a baseline to compare the two groups and assess the effects of the dance programme.

After intervention results

No statistically significant changes were found regarding feelings about future or about overstress. Neither feelings about future, nor feelings about influencing life, nor feelings about overstress in everyday life could change statistically significantly over the eight weeks period while intervention programme was held. Also no significant difference can be seen between the before and after intervention states regarding SRH or SRH compared with age peers in either group - as shown in Table 2 and Table 5.

Using stress-relieving substances by the adolescents didn't change significantly within the eight weeks period neither in the EG nor in the CG- if one divide the two groups for users (at least every 2 or 3 weeks) and nonusers (never or less than monthly). Considering the original scales in one case there is a significant change. In the case of using “natural active substances” the proportion of daily users decreased statistically

significantly in the experimental group: from 18% to 0% ($p=0.047$) while there was no significant change in the control group regarding the same item - as seen in Table 6. Analysing directly the users of the given substance (omitting those who have never used it), reduction is more visible: 41% before and 0% after the dance programme ($p=0.038$) - Table 7. Based on this result the dance programme could substitute the use of natural active substances for adolescents. Meanwhile the uses of the other substances didn't change significantly in the examined period neither in EG nor in CG.

There was also one item among psychosomatic symptoms where statistically significant change was noticed. Half of the symptoms were experienced by a bit higher while half of it by a bit lower proportion of the control group after the eight weeks than before, however there was no significant increase or even decrease regarding the twelve symptoms. On the other hand most of the asked symptoms were experienced by a bit (but not significantly) lower proportion of the experimental group after the intervention than before, moreover one symptom called stress reduced significantly ($p=0.047$) - Table 8 and Table 9. Before the intervention 87.8% of the experimental group experienced stress at least several times a month, while after the intervention this proportion was reduced to 69.4%. This result demonstrates that the dance intervention could successfully decrease subjective experience of stress, which shows the effectiveness of the programme.

Conclusions

Our research was aimed to evaluate if a creative dance intervention is effective for girls with psychosomatic symptoms or stress, and to find out how it could influence the girls' self-rated health (SRH). Results give rise to optimism about influencing mental health. Based on the research, stress as psychosomatic symptom can be reduced by a non-pharmacological therapy, called dance. Furthermore the use of natural active substances can be also reduced by it. On the other hand direct connection between the dance programme and the self-rated health hasn't been proved.

Results of this study are advised to be interpreted in light of the low number of research participants and limited duration of intervention. The research done is a good starting point for further, more complex researches on the subject, as it proved the effectiveness of the dance programme. Further researches are needed to verify the results obtained and to answer additional questions. For verifying, experiments on larger sample size and/or based on longer dance programme and/or applying more accurate measurements can be carried out. Another research might be to compare the effects of a general dance course and the Swedish model. Additional researches may investigate the possibility of replacements of other medicines and may explore the correlation between dance intervention and SRH effecting stress symptoms.

Conflict of Interest

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

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