INFLUENCING SELF-RATED HEALTH AMONG ADOLESCENT GIRLS WITH DANCE INTERVENTION

A Randomized Controlled Trial

Anna Duberg, RPT; Lars Hagberg, PhD; Helena Sunvisson, PhD; Margareta Möller, PhD

Objective: To investigate whether dance intervention influenced self-rated health for adolescent girls with internalizing problems.

Design: Randomized controlled intervention trial with follow-up measures at 8, 12, and 20 months after baseline.

Setting: A Swedish city with a population of 130,000.

Participants: Girls aged 13 to 18 years with internalizing problems, ie, stress and psychosomatic symptoms. A total of 59 girls were randomized to the intervention group and 53 were randomized to the control group.

Intervention: The intervention comprised dance classes twice weekly during 8 months. Each dance class lasted 75 minutes and the focus was on the joy of movement, not on performance.

Main Outcome Measures: Self-rated health was the primary outcome; secondary outcomes were adherence to and experience of the intervention.

Results: The dance intervention group improved their self-rated health more than the control group at all follow-ups. At baseline, the mean score on a 5-point scale was 3.32 for the dance intervention group and 3.75 for the control group. The difference in mean change was 0.30 (95% CI, −0.01 to 0.61) at 8 months, 0.62 (95% CI, 0.25 to 0.99) at 12 months, and 0.40 (95% CI, 0.04 to 0.77) at 20 months. Among the girls in the intervention group, 67% had an attendance rate of 50% to 100%. A total of 91% of the girls rated the dance intervention as a positive experience.

Conclusions: An 8-month dance intervention can improve self-rated health for adolescent girls with internalizing problems. The improvement remained a year after the intervention.

Exercise is considered an active strategy to prevent and treat depression and anxiety for school-aged youth. It has been shown to promote positive thoughts and feelings, enhance confidence to cope with problems, and provide increased confidence and self-control. Participating in physical activity can also improve self-esteem and foster positive self-worth. To increase physical activity in young age, an organized, noncompetitive, leisure-time intervention is considered beneficial.

Dance is a well-established and popular form of physical activity, particularly for young women. It can provide a supportive environment and an opportunity to enhance low body attitudes and physical self-perceptions. It is suggested that dance can reduce disabling conditions resulting from stress.
The primary aim of this article is to describe whether and how a dance intervention for adolescent girls with internalizing problems can influence self-rated health (SRH). A secondary aim is to describe the adherence to and experience of the dance intervention.

METHODS

STUDY DESIGN

A randomized controlled intervention trial was conducted for 3 years. Data were collected with a questionnaire that was administered regularly (Figure). The 8-month dance intervention was performed during years 1 and 2, from October to May. Both interventions were prompted by a randomization. By running the dance intervention during 2 years, it was possible to offer the intervention to more girls.

STUDY POPULATION

The study population comprised girls aged 13 to 18 years with internalizing problems who had recurrent visits to the school nurse for psychosomatic symptoms such as pain in the head, stomach, neck, back, and/or shoulder and for persistent feelings of tiredness, being worried, or being in low spirits. Exclusion criteria were severe hearing impairment, intellectual disability, difficulties with the Swedish language, or if Child and Adolescent Psychiatric Care had advised against participation. Baseline characteristics are presented in Table 1.

DANCE INTERVENTION

The dance intervention took place in a central gym twice weekly for 8 months under the guidance of 3 educated dance teachers (1 at a time). The duration of the class was 75 minutes, which included 15 minutes of warm-up, 40 minutes of dance practice, 15 minutes of stretching, light massage in pairs, and relaxation, and 5 minutes of reflection. The dance practice was classified as moderate to vigorous physical activity, and the intention was to offer an opportunity to experience the own body in a positive way. The choreography included a part when the girls created their own dance routine and moved spontaneously.

During the intervention year, the theme of dance styles varied between African dance, jazz, and contemporary dance. The internalizing problems were not brought up during the dance classes. At the end of the intervention, the participants were presented with a number of alternatives to keep up dancing or exercise elsewhere.

PROCEDURE

Recruitment was carried out in collaboration with the school health care program. The school nurses asked eligible girls who sought consultation for internalizing problems or stress whether they wished to participate in the dance project. Written and oral in-
The Regional Ethical Review Board in Uppsala, Sweden, approved the study. Participants found to be at risk for severe depression, indicated by a score of 34 points or higher on the Center for Epidemiologic Studies Depression Scale for Children, were offered to meet with an experienced licensed psychologist.

OUTCOME MEASURES

The questionnaire contained 88 questions regarding lifestyle, eg, SRH, emotional distress, psychosomatic symptoms, feelings, depression, sleep, school, interests, friends, leisure time, and how they enjoy dance. In this article, we will share results concerning SRH, adherence, and experience.

Self-rated health is typically measured with the single-item question “How do you rate your general health?” with the following responses: 1 indicates very poor; 2, poor; 3, neither good nor poor; 4, good; and 5, very good. It has proven to be a strong predictor of physical health status for adolescents and has been tested for validity and reliability. It includes general health, well-being, perceptions of symptoms, and vulnerability.

The experience of the dance intervention was evaluated with a graphic rating scale, which has proven to be superior to the visual analog scale in terms of both consistency and stability. The question was “How do you experience dancing while you perform it?”; the rating scale started at entirely negative and ended at entirely positive. The cutoff was set between neutral and mostly positive.

STATISTICAL ANALYSIS

Differences between groups in SRH were analyzed with t test. The change score was analyzed using paired observations. Statistical significance was set at P < .05. Linear regression analysis was also performed to study the effect of the SRH baseline values on the change score.

RESULTS

The current analysis includes 112 adolescent girls with internalizing problems. The baseline characteristics of the participants in the 2 groups were well balanced in most variables (Table 1), but the control group scored higher at baseline concerning good SRH. This has been adjusted for and will be described further.

ADHERENCE TO THE INTERVENTION

A total of 59 girls were randomized to the intervention group, of whom 11 dropped out (10 girls due to scheduling conflicts between the dance class and their school curriculum and 1 girl because the dancing did not suit her interest). 48 girls remained. The dance classes were given 48 times during the 8-month period. A total of 6 girls (13%) attended more than 89% of the classes, 26 girls (54%) attended 50% to 89%, and 16 girls (33%) attended 10% to 49%.

EXPERIENCE OF THE DANCE INTERVENTION

At the 8-month follow-up, directly after the intervention had ended, the remaining 48 girls rated their experience of the intervention; 47 answered the question. Forty-three girls (91%) rated the intervention to be a positive experience, 3 girls (6%) rated it as neutral, and 1 girl (2%) rated it as negative.

SELF-RATED HEALTH

The dance intervention group improved their SRH more than the control group at all follow-ups (Table 2). The difference in mean change was 0.30 (95% CI, −0.01 to 0.61) at 8 months, 0.62 (95% CI, 0.25 to 0.99) at 12 months, and 0.40 (95% CI, 0.04 to 0.77) at 20 months.

---

**Table 1. Baseline Characteristics**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention (n = 59)</th>
<th>Control (n = 53)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (y)</td>
<td>16 (25)</td>
<td>16 (2)</td>
</tr>
<tr>
<td>Weight class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>4 (7)</td>
<td>0</td>
</tr>
<tr>
<td>Normal</td>
<td>41 (69)</td>
<td>36 (68)</td>
</tr>
<tr>
<td>Overweight</td>
<td>8 (14)</td>
<td>3 (6)</td>
</tr>
<tr>
<td>Born in Sweden</td>
<td>41 (69)</td>
<td>28 (53)</td>
</tr>
<tr>
<td>Lives with both parents</td>
<td>33 (56)</td>
<td>36 (68)</td>
</tr>
<tr>
<td>Parent on sick leave</td>
<td>6 (10)</td>
<td>6 (11)</td>
</tr>
<tr>
<td>Father</td>
<td>3 (5)</td>
<td>3 (6)</td>
</tr>
<tr>
<td>Both</td>
<td>1 (2)</td>
<td>0</td>
</tr>
<tr>
<td>Parents’ employment status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both unemployed</td>
<td>4 (7)</td>
<td>0</td>
</tr>
<tr>
<td>Both employed</td>
<td>41 (69)</td>
<td>36 (68)</td>
</tr>
<tr>
<td>Rates health as poor or very poor</td>
<td>8 (14)</td>
<td>3 (6)</td>
</tr>
<tr>
<td>Experiences feeling of stress frequently</td>
<td>41 (69)</td>
<td>28 (53)</td>
</tr>
<tr>
<td>Participated in dancing before start of study</td>
<td>33 (56)</td>
<td>36 (68)</td>
</tr>
</tbody>
</table>

---

- **a** Mean age for both the intervention group and the control group was 16 years.
- **b** Weight class is based on body mass index adjusted for age. Missing data for 1 person (2%) in the control group.
- **c** This variable was dichotomized into rarely (never, rarely, or sometimes) or frequently (frequently or always).
The key finding in this study was that girls participating in the dance intervention improved their SRH more than those in the control group. This effect remained 4 and 8 months after the intervention had ended. The results also show high adherence and positive experience, which suggest that an intervention with dance can be suitable for adolescent girls with internalizing problems.

Improved SRH for adolescents after physical activity is consistent with a study from 2008. A questionnaire answered by 1090 Swedish high school students showed that the number of students who participated regularly in physical activity reported good or very good health (n = 669 [84.2%]) compared with the students who irregularly performed physical activities (n = 198 [70%]) (P = .001). The connection between SRH and physical activity was also shown in a study comprising 466 Australian students (medium activity, P = .002; high activity, P = .001). The suggestion to use dance in an intervention for adolescent girls is supported in a descriptive intervention for adolescent girls is emphasized by Barr-Anderson et al. The opportunity to make some input into the dance classes regarding music, and the girls themselves always created part of the choreographies. This is said to facilitate a sense of ownership. Finally, the social aspect is very important. The opportunity to make new friends and spend time doing something they enjoy with others who have a similar interest might be a main issue that can affect recruitment, retention, and interest to participate. It is possible that the social aspect combined with the attention given to the girls affected SRH. In future studies, it would be interesting to have several intervention arms for comparison. The current study examines the effect of a whole intervention, not the actual dancing. However, research shows that dance appeals to adolescent girls, which in turn incorporates involvement and contributes to an increased physical effect.

Some limitations in the design should be noted. The baseline scores were lower in the intervention group compared with the control group, and lower scores generally improve more than high scores. There is a risk that the treat-
ment effect is overestimated by looking at change scores. Nevertheless, linear regression showed that a significant difference between the groups remained at the 12-month follow-up, despite the inclusion of baseline values.

Moreover, given the subjective nature of the study outcome (SRH) and that the girls knew the study purpose, there is a risk of potential bias in favor of the dance intervention arm. This sort of bias easily arises in subjective measures. The risk that the girls in the intervention group reported higher values to please the instructors or to show gratitude to the research team needs to be taken into consideration. In all, however, the questionnaire comprised 88 questions, and analyses show that there are areas without any differences between the groups and some areas where the control group had improved more. This might illustrate straightforwardness in how the girls answered the questionnaire, and further results will be illuminated in coming articles.

This study points out the role of joyful social physical activity in influencing health. We conclude that an intervention with dance twice weekly for 8 months is feasible and can improve SRH in adolescent girls with internalizing problems, even if the girls lacked previous experience in dancing. According to these results, despite problems such as stress and psychosomatic symptoms (and other potential challenges in being an adolescent girl), dance can result in high adherence and a positive experience for the participants, which might contribute to sustained new healthy habits.

Accepted for Publication: June 7, 2012.
Published Online: November 12, 2012. doi:10.1001/jamapediatrics.2013.421

Correspondence: Anna Duberg, RPT, Centre for Health Care Sciences, Orebro County Council, and Orebro University, PO Box 1324, SE-70113 Orebro, Sweden (anna.duberg2@orebro.se).

Author Contributions: Study concept and design: Duberg, Hagberg, and Moller. Acquisition of data: Duberg, Hagberg, Sunvisson, and Moller. Analysis and interpretation of data: Duberg, Hagberg, and Moller. Drafting of the manuscript: Duberg, Hagberg, and Moller. Critical revision of the manuscript for important intellectual content: Duberg, Hagberg, Sunvisson, and Moller. Statistical analysis: Duberg and Hagberg. Obtained funding: Sunvisson and Moller. Administrative, technical, and material support: Duberg and Moller. Study supervision: Hagberg and Moller.

Conflict of Interest Disclosures: None reported.

Funding/Support: This work was supported by the Orebro County Council and the municipality of Orebro.

Additional Contributions: We thank the school nurses in Orebro for assistance with recruitment, all the girls in the study, and Göran Jutengren, PhD, for statistical assistance.

REFERENCES