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Vårt biologiska program
Composite effects of group drumming therapy on modulation of neuro-endocrine parameters in normal subjects

Bittman BB et al
Altern Therapy Health 7:38-47, 2001

Recreational music-making: a cost-effective group interdisciplinary strategy for reducing burnout and improving mood states in long-term care workers.

Bittman BB et al
Adv Mind Body Med. 2003 Fall-Winter;19(3-4):4-15
Mind-body interrelationship in DNA methylation.

Szyf M.

A study to determine the effect of music on physiological parameters and level of pain in patients undergoing application of a C-clamp after percutaneous coronary intervention

Randomized controlled study. Forty-three people (20 experimental and 23 control) were recruited. In the music group, there were statistically significantly more reductions (P=0.001) in heart rate, respiratory rate, and oxygen saturation than in the control participants at 45 minutes. In the music group, statistically significant reductions (P=0.001) in systolic blood pressure, heart rate, respiratory rate and oxygen saturation were found at the four time points, but not in the control group. Statistically significant differences in pain scores were found at 45 minutes for participants in the music group compared with the control group (P=0.003). Participants in the control group showed statistically significant increases in pain at 45 minutes compared with baseline (P<0.001).
Relaxation and music reduce pain following intestinal surgery (Good M et al).


Relaxation, chosen music, and their combination, were tested for pain relief following intestinal (INT) surgery in a randomized clinical trial. The 167 patients were randomly assigned to one of these three intervention groups or control and were tested during ambulation and rest on postoperative days 1 and 2. Pain sensation and distress were measured with visual analog scales (VAS). Multivariate analysis of covariance showed significantly less post-test pain in the intervention groups than in the control group on both days after rest and at three of six ambulation post-tests (p = .024-.001), resulting in 16-40% less pain. These interventions are recommended along with analgesics for greater postoperative relief without additional side effects.
Objective: To evaluate the extent to which music may affect the endothelial function.

Methods: Randomized four-phase crossover and counterbalanced trial in ten healthy, nonsmoking volunteers (70% male; mean age, 35.6 years) that included self-selections of music evoking joy or provoking anxiety. Two additional phases included watching video clips to induce laughter and listening to audio tapes to promote relaxation. Recuperation of circulation after occlusion in forearm was significantly faster with joyful music.

Conclusion: Listening to joyful music may be an adjunctive life-style intervention for the promotion of vascular health.
Participants in the Swedish Surveys of Living Conditions (ULF). Proportion who practiced playing a music instrument at least once a week in different age groups and study periods   Men

Light blue= age 16-19, Dark blue= age 75-84
Participants in the Swedish Surveys of Living Conditions (ULF). Proportion who practiced playing a music instrument at least once a week in different age groups and study periods. Women
Light blue= age 16-19, Dark blue= age 75-84
In an experiment in a home for elderly, one floor was assigned experimental and another one control group. In the experimental group, staff explored interests and allowed elderly to start groups with common interests. The control group participants were followed with the same observations as the experimental group participants at 0, 3 and 6 months (end of study)

Social activities and wellbeing increased significantly in the experimental group but not in control group

HbA1C (%) means and SEM in elderly subjects followed during psychosocial activation and matched control subjects (n=30×2, 20w, 10m in each group. Mean age 78 (range 52-91). Two-way analysis of variance (interaction) ______________ activation

Mean (nmol/l) plasma testosterone (and SEM) in "activated" and "control" group
________ activation ----------- control. Two-way analysis of variance (interaction).
Mean (nmol/l) plasma estradiol (and SEM) in "activated" and "control" group
________ activation ----------- control. Two-way analysis of variance (interaction).

Wikström BM, Theorell T, Sandström S.

Medical health and emotional effects of art stimulation in old age. A controlled intervention study concerning the effects of visual stimulation provided in the form of pictures.


Participants were randomly allocated either to the intervention (n = 20) or to the control (n = 20) group. Participants in both groups had the same amount of social contact with and attention from the experimenter. The difference between the groups indicated improved well-being in the intervention group, an improvement not seen in the control group.
Laxative in two groups

![Graph showing laxative scores over occasions.](image)

Gerontologist. 2006 Dec;46(6):726-34.

166 healthy, ambulatory older adults from the Washington, DC, area were assigned either to an intervention (chorale) or comparison (usual activity) group and assessed at baseline and after 12 months.

The intervention group reported a higher overall rating of physical health, fewer doctor visits, less medication use, fewer instances of falls, and fewer other health problems than the comparison group. The intervention group also evidenced better morale and less loneliness than the comparison group. In terms of activity level, the comparison group evidenced a significant decline in total number of activities, whereas the intervention group reported a trend toward increased activity.

Continued positive findings after two years reported in Arts and Health1: 48-62, 2009
Fast

Slow

Pain

Wellness

Fast & Slow Diagram

Konarski, 1992

Three groups, one with extra music education (60 min every week of ”socialising” music), one with extra computer education and one with ”normal” curriculum. Saliva cortisol in the afternoon of regular school days decreased significantly during the study year in the music group but showed no significant change in the two other groups.
Log ratio follow-up/initial afternoon saliva cortisol

Afternoon saliva cortisol follow-up patterns
IBS-patients who wanted to start singing in a choir were invited to RCT-study with interventions lasting for a whole year. Half of them were randomised to choir once a week and half of them to group information and discussion without singing once a week. Both groups were examined before start as well as six, nine and twelve months of group activities. Plasma fibrinogen developed significantly more favourably and stomach pain and plasma motilin tended to develop more favourably in the singing group during the study year. Saliva testosterone increased markedly during the first half-year in the singing group but not in the other group. But the difference tended to disappear towards the end of the year.


Mean saliva testosterone conc in choir group and talk group of IBS-patients, randomly selected. For each individual and assessment day the point shows the geometric mean of six assessments from morning to evening. Before start, after six months, after nine months and after 12 months.

Grape, Wikström, Ekman, Hasson and Theorell Psychother Psychosom 79:196-198, 2010
"Vitality effect": VAS change (after minus before intervention occasion) in alertness (0-10, from extreme tiredness to extreme alertness) four months after start in choir group (n=18) and talk group (n=15) (Grape 2007)
Biological concomitants of the singing lesson

• In both groups rising plasma oxytocin (p = 0.009)

• Immunological parameter (TNF-alpha in serum) rising in professionals and decreasing in amateurs (interaction p = 0.045)

• Similar tendency for serum cortisol (interaction p = 0.063)

Mean VAS before-after singing lesson (high score good)

• Lazy-energetic
• Amateurs 5.2 - 7.2
• Professional 5.9 - 7.4

• Main effect (p=0.03), both groups improved but no interaction
Table 1. Means and standard deviations for vitality effect. Visual analogue scale - after minus before, ten centimeter horizontal line, degree of tiredness (left)/vitality (right) - of a number of cultural activities lasting for one hour. Number of subjects 29-36

<table>
<thead>
<tr>
<th>Activity</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engaging theatre</td>
<td>2.76</td>
<td>2.13</td>
</tr>
<tr>
<td>One man theatre</td>
<td>2.62</td>
<td>1.90</td>
</tr>
<tr>
<td>Music Hall</td>
<td>2.42</td>
<td>1.75</td>
</tr>
<tr>
<td>Scottish</td>
<td>2.38</td>
<td>2.08</td>
</tr>
<tr>
<td>Theatre</td>
<td>2.07</td>
<td>1.81</td>
</tr>
<tr>
<td>Pop group</td>
<td>2.06</td>
<td>2.05</td>
</tr>
<tr>
<td>Art lottery</td>
<td>1.73</td>
<td>1.54</td>
</tr>
<tr>
<td>Wind players</td>
<td>1.71</td>
<td>2.18</td>
</tr>
<tr>
<td>Jazz group*</td>
<td>1.67</td>
<td>1.54</td>
</tr>
<tr>
<td>Chamber music</td>
<td>1.65</td>
<td>2.37</td>
</tr>
<tr>
<td>Chinese theatre*</td>
<td>1.10</td>
<td>2.72</td>
</tr>
<tr>
<td>Dance group</td>
<td>1.05</td>
<td>2.42</td>
</tr>
<tr>
<td>Movie</td>
<td>0.54</td>
<td>2.23</td>
</tr>
</tbody>
</table>

*For logistic reasons the sample was divided into halves for these two activities.
Pilot study of health effects of a sept. to nov. once a week cultural intervention in four work places (KROKUS project, Hartzell M, Theorell T (2007) Stress Research Institute – P2665) in northern Sweden showed beneficial effects on plasma fibrinogen and MBI (burnout) scores among those who felt the most mental activation by the programs (vitalisation assessed before/after each weekly activity), but

SOCIAL SUPPORT WAS ADVERSELY AFFECTED DURING THE PERIOD IN THOSE ENTHUSIASTIC SUBJECTS. “JEALOUSY EFFECT”?

Change in plasma oxytocin concentration pmol/l in patients post open heart surgery in "Music" versus "control" group

P=0.004 post (30m) and p=0.024 30 minutes later resting in silence

Nilsson Ulrica: Soothing music can increase oxytocin levels during bed rest after open-heart surgery: a randomized control trial

J Clinical Nursing 18:2153-2161, 2009
One possibility to stimulate social cohesiveness and creativity would be to increase cultural activity in workplaces.

So we asked: Are cultural activities (movies, theatre performances, concerts, exhibitions) organised for the employees in your workplace?  
0=never, 1= some time per year, 2= some time per month, 3= some time per week or more often.
Figure 1. Prevalence of different frequencies of cultural activities at work reported during the three study years

0= No activities 1= Some time per year 2= Some time per month 3= Some time per week or more often. Swedish Longitudinal Occupational Study of Health, 2006 n= 5037, 2008 n= 9623, 2010 n= 8912
Significant prediction of emotional exhaustion from 2008 to 2010 in Swedish population study of working men and women

Tested explanatory variables: Gender, age, income, non-listening boss, psychological demands, decision authority, emotional exhaustion at start and cultural activities at work. N=6214

The following factors had significant and mutually independent explanatory value in multivariate analysis:

- Emotional exhaustion at start
- Age
- Psychological demands
- Gender
- Decision authority
- Cultural activity at work

Non-significant:

- Income
- Non-listening boss

Theorell. Osika, Leineweber, Magnusson Hanson, Bojner Horwitz and Westerlund: Is cultural activity at work related to mental health in employees? Int Arch Occ Env Health 2012 (DOI 10.1007/s00420-012-0762-8)
101 health care workers volunteered for the study. Randomization into two groups. In the experimental group participation in fine art activities (films, concerts, art exhibitions or singing in a choir) went on once a week for 8 weeks (the control group participants had to wait till after 8 weeks). Two SF-36 factors (social functioning and vitality improved more in the experimental group in the pre-post comparison
Health Effects on Leaders and Co-Workers of an Art-Based Leadership Development Program

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Two alternatives of leader education

Schibbolet

Classical psychosocial educ
General design, randomised leaders

Schibbolet

- 23 leaders
- 100 evaluators

Classical

- 24 leaders
- 100 evaluators

4 medarbetare + kollega + chef
Schibbolet intervention

1. Concentration (3-6 min) 
   Write down

2. Listen to Schibbolet (60 min)

3. Write down (5-7 min)

4. Group thoughts plenum (35 min)

5. Thoughts in small groups (30 min)

6. Group thoughts plenum (35 min)

7. Write down (5-7 min)
Themes

Life/death
Power/Freedom
Betrayal/Courage
Loneliness/Love
Leadership – ULL

- Transformative
- Transactional
- Laissez faire
- Stress management
- Leader competence
- Social competence
Means for "covert" coping in the two groups in the Schibbolet study (managers and employees together) Two-way ANCOVA p=0.007, p=0.02 for employees only
DHEA-s micromol/l on three occasions in the two groups p=0.003 participants and subordinates together, p=0.027 subordinates only.
Total "mental score" (sleep disturbance, emotional exhaustion, depressive symptoms) in the two groups p=0.014 participants and subordinates, p=0.028 subordinates only

![Chart showing mental score over time]
Highest score: No laissez faire.

Conclusion: Conventional education made the leaders convinced that they became more active - their subordinates saw the opposite.

Schibboleth: The subordinates saw an improvement but the leaders themselves thought they became worse (Romanowska et al submitted 2012)