# Physical Fitness Exercise vs. Cognitive Behavior Therapy on Reducing the Depressive Symptoms Among Community-Dwelling Elderly Adults.

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## Objective

To compare the effectiveness of the physical fitness exercise programme (PFE) and cognitive behavior therapy (CBT) on primary (depressive symptoms) and secondary outcomes (6-min walk distance, quality of life, and social support) for community-dwelling elderly adults with depressive symptoms.

## Methods

A prospective randomized control trial was conducted in three communities in northern Taiwan. Fifty-seventy elderly were randomly assigned to one of the three groups: the PFE group, the CB group, or the control group. The primary and secondary outcomes were collected immediately, at 3 months, and at 6 months after the interventions.

## Results

After the interventions, participants in both experimental groups demonstrated significantly lower symptoms of depression ($p = .012$) and perceived more social support from those around them ($p < .001$) than the control group. Moreover, after intervention, participants in the PFE group had a substantially greater 6-min walk distance ($p<.05$), and a better quality of life ($p<.001$) than those in the CBT and control groups. However, there were no differences regarding depressive symptoms, 6-min walk distance, and quality of life amongst the three groups at the two subsequent follow-up assessments.

## Discussion

We came to consensus that the effectiveness of both interventions in our study was only significant at T2. There are several possible explanations for this. First, not all participants in the PFE group maintained their exercise programme (150 min/week moderate intensity; 100% at T2, 63.16% (n = 12) and 47.37% (n = 9) at T3 and T4, respectively). Second, both of the interventions in this study are group based, which increases participants' social interactions during the 12-week programmes in both of the intervention groups to help relieve the DS (Sims et al., 2009). However, during the follow-up period, such social interaction decreased, thus the effectiveness of our intervention could not be maintained. Further, as seen in the descriptive data, participants in the control group had lower DS at the three posttests than at T1. These results are consistent with several studies (Brittle et al., 2009; Duarte et al., 2009; Durmus et al., 2009). The placebo effect may accompany and enhance the effectiveness of medical interventions with demonstrated specific treatment efficacy. Moreover, the communicative interaction of practitioners with patients, both verbal and nonverbal, may produce placebo effects even without the use of discrete treatments by giving the patients a feeling of assurance (Miller et al., 2009). Additionally, Duarte (2009) found that patients in a control group received much less structured psychological care but were provided with emotional support and general guidelines about the treatment, which may lessen their DS.

## limitations

This study has several limitations. First, participants were recruited from three communities in northern Taiwan with a relatively better health status. To generalize findings to the entire community-dwelling elderly with DS, future research should also recruit more of the fragile elderly, in order to generate a larger representative sample. Secondly, the participants were studied over a relatively short period. To examine the long-term effectiveness of the intervention, a longer longitudinal design is needed. Lastly, there were short-term effects from these two interventions in this study. Further research could aim to either motivate the elderly participants in intervention groups to maintain these intervention practices (either exercise or CBT) and incorporate them into their daily lives, or to manage the placebo effects among some participants in the control group.

## Conclusions

Immediately after the interventions, there were significant decreases in depressive symptoms and perceived social support in both experimental groups. When considering the effectiveness of the increase in the 6-min walk distance and raising the patients' quality of life, PFE may be a better intervention for elderly adults with depressive symptoms.

Table 1 Demographic characteristic at baseline

| Variables | PFE group (n=19) frequency (%) or mean (SD) | CB group (n=18) frequency (%) or mean (SD) | Control group (n=20) frequency (%) or mean (SD) | Total frequency (%) or mean (SD) | P |
|---|---|---|---|---|---|
| Gender | | | | | .691 |
| Male | 8 (42.1) | 10 (55.5) | 9 (45.0) | 27 (47.4) | |
| Female | 11 (57.9) | 8 (44.4) | 11 (55.0) | 30 (52.6) | |
| Education (yrs) | | | | | .493 |
| ＞6years | 6 (31.6) | 8 (44.4) | 10 (50.0) | 24 (42.1) | |
| ≦6 years | 13 (68.4) | 10 (55.6) | 10 (50.0) | 33 (57.9) | |
| Marital | | | | | .648 |
| married | 14 (73.7) | 12 (66.7) | 16 (80.0) | 42 (73.7) | |
| Single | 5 (26.3) | 6 (33.3) | 4 (20.0) | 15 (26.3) | |
| Religious | | | | | .365 |
| Yes | 16 (84.2) | 14 (77.8) | 13 (65.0) | 43 (75.4) | |
| No | 3 (15.8) | 4 (22.2) | 7 (35.0) | 14 (24.6) | |
| Financial | | | | | .438 |
| enough | 12 (63.2) | 14 (77.8) | 16 (80.0) | 42 (73.7) | |
| Not enough | 7 (36.8) | 4 (22.2) | 4 (20.0) | 15 (26.3) | |
| Self-awareness health | | | | | .270 |
| Average/better | 13 (68.4) | 10 (55.6) | 16 (80.0) | 39 (68.4) | |
| Worse | 6 (31.6) | 8 (44.4) | 4 (20.0) | 18 (31.6) | |
| Age | 76.42 (5.31) | 77.39 (6.09) | 75.85 (6.56) | 76.53 (5.94) | .693 |
| ADL | 98.16 (2.99) | 96.39 (5.37) | 99.00 (2.62) | 97.89 (3.89) | .197 |

ADL = the scores of Barthel Index

Table 2. Comparison of training gains in outcome variables by group

| variable | PFE group [1] (n=19) mean (SD) | CB group [2] (n=18) mean (SD) | Control group [3] (n=20) mean (SD) | K-W test | p | Post hoc |
|---|---|---|---|---|---|---|
| DS (GDS-15) | | | | | | |
| T2-T1 | -4.00 (2.49) | -3.50 (1.95) | -2.00 (1.69) | 8.91 | .012 | 1, 2＞3 |
| T3-T1 | -4.21 (2.59) | -2.61 (3.51) | -2.45 (1.79) | 4.26 | .119 | |
| T4-T1 | -3.84 (2.81) | -3.00 (3.12) | -2.10 (2.53) | 3.21 | .201 | |
| 6-min walk distance | | | | | | |
| T2-T1 | 15.37 (42.47) | -.87 ( 8.90) | -13.85 (39.76) | 7.91 | .019 | 1＞2, 3 |
| T3-T1 | 2.21 (62.56) | -16.57 (40.16) | -35.99 (95.68) | 3.35 | .187 | |
| T4-T1 | 6.65 (55.85) | -18.08 (38.42) | -37.31 (92.40) | 4.68 | .096 | |
| Quality of life | | | | | | |
| T2-T1 | 15.51 (11.75) | 3.79 (14.37) | 2.82 ( 8.23) | 10.79 | .005 | 1＞2, 3 |
| T3-T1 | 10.53 (17.09) | 5.41 (13.01) | 4.77 (10.93) | 2.04 | .360 | |
| T4-T1 | 11.86 (15.78) | 2.59 (17.71) | 5.38 (11.80) | 3.41 | .182 | |
| Physical | | | | | | |
| T2-T1 | 15.01 (11.93) | 4.33 (17.64) | 2.75 (8.96) | 9.71 | .008 | 1＞3 |
| T3-T1 | 9.96 (21.18) | 8.47 (15.12) | 6.21 (14.71) | 1.95 | .378 | |
| T4-T1 | 12.29 (17.76) | 4.64 (26.01) | 6.36 (15.28) | 1.49 | .474 | |
| Mental | | | | | | |
| T2-T1 | 16.02 (16.08) | 3.24 (16.76) | 2.89 (12.09) | 6.93 | .031 | 1＞3 |
| T3-T1 | 11.12 (18.49) | 2.34 (14.99) | 3.32 (11.42) | 2.74 | .254 | |
| T4-T1 | 11.44 (18.33) | .534 (18.68) | 4.39 (13.39) | 3.91 | .142 | |
| Social support (ISSB) | | | | | | |
| T2-T1 | 4.84 (2.93) | 5.44 (2.99) | -.25 (4.34) | 20.43 | .000 | 1, 2＞3 |
| T3-T1 | 1.26 (3.89) | 4.11 (4.46) | -.30 (3.65) | 9.07 | .011 | 2＞1, 3 |
| T4-T1 | 2.05 (3.10) | 4.06 (4.34) | .05 (4.31) | 9.86 | .007 | 1, 2＞3 |

KW= Kruskal-Wallis test; post hoc:Mann-Whitney test; 1=PFE group, 2=CB group, and 3= Control group
GDS-15＝Geriatric Depression Scale -15; ISSB＝Inventory of Socially Supportive Behaviors
T1 = baseline; T2 = 3 months after baseline (after a 12-week intervention); T3 = 6 months after baseline (3 months after intervention); T4 = 9 months after baseline (6 months after intervention)