FOCUSED QUESTION
What are the effects of office ergonomics training when combined with a sit-stand workstation on performance and visual, behavioral, and musculoskeletal discomfort among well females completing computer-based work?


CLINICAL BOTTOM LINE:
This Level I randomized controlled study provided evidence that ergonomic training of adjusting postures, taking work breaks, and using adjustable chairs for women can reduce musculoskeletal discomfort and minimize visual difficulties. This study stated that making changes to everyday work attire and modifying musculoskeletal postures helped eliminate lower body musculoskeletal symptoms. Ergonomic training can also help employees increase their productivity throughout the day.

Occupational therapists can educate employers about simple ergonomic changes in the work setting to improve employees’ health and possibly even their quality of work. Occupational therapists also can teach workers ergonomic changes that may improve overall musculoskeletal health. However, some limitations to this study were a small sample size made up of all females, being completed in a simulated office setting, and being completed over a brief 19-day period.

RESEARCH OBJECTIVE(S)
List study objectives.

- Investigate the effects of office ergonomics training that has been combined with a sit-stand workstation on performance, visual discomfort, behavior, and musculoskeletal discomfort.
- Characterize the effects of performing a computer-based customer service job and compare the temporal patterns of symptoms between the two groups.
DESIGN TYPE AND LEVEL OF EVIDENCE:

Level I: Randomized controlled trial

Limitations (appropriateness of study design):
Was the study design type appropriate for the knowledge level about this topic? Circle yes or no, and if no, explain.

YES/NO

SAMPLE SELECTION
How were subjects selected to participate? Please describe.

Participants were recruited by a local newspaper advertisement to participate in the study. They were then screened by phone to assess current health status. Following a review of their current health status, potential participants then completed a health and discomfort survey to assess their health status and discomfort status while working.

Inclusion Criteria

Participants were required to be in generally good health, no reports of repetitive strain injuries, and have acceptable vision.

Exclusion Criteria

Participants could not be currently on any pain medication, have a receptive strain injury, or have poor vision.

SAMPLE CHARACTERISTICS
N = 22

<table>
<thead>
<tr>
<th>% Dropouts</th>
<th>0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>#/ (%) Male</td>
<td>0(0%)</td>
</tr>
<tr>
<td>#/ (%) Female</td>
<td>22(100%)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Not Reported</td>
</tr>
<tr>
<td>Disease/disability diagnosis</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Check appropriate group:

<20/study group | [20–50/study group] | 51–100/study group | 101–149/study group | 150–200/study group
INTERVENTION(S) AND CONTROL GROUPS

*Add groups if necessary*

Group 1: Ergonomic Trained

| Brief Description | Attended a 4-day training course to learn the customer service representative simulated job tasks, including practice and competency task completion. Participants received training through lecture and video about ergonomic principles and how to set up workstations. The workday intervention consisted of days of free choice (choosing either sitting or standing) and days of mandatory standing. Work tasks were also differentiated based on cognitive demands of standard, moderate, and high demand. These cognitive demands were presented every 3 days through randomized order. The workday interventions occurred in 3-day blocks during the 15 days. Participants completed mandatory standing for 5-minute duration on days 7 to 9 and a 20-minute duration on days 10 to 12. Ergonomic reminders were provided on all days of the intervention. Coaching was also provided during the days of mandatory standing. |
| Setting          | Simulated office |
| Who delivered?   | NR |
| Frequency?       | 50 minutes each 8-hour day |
| Duration?        | 15 days |

Group 2: Minimally Trained

| Brief Description | Attended a computer program training program for the custom service program being used for this study. No coaching or ergonomic reminders were provided. Participants in the control group were not required to complete mandatory sit or stand periods. |
| Setting          | Simulated office |
| Who delivered?   | NR |
| Frequency?       | Brief overview of program provided once; 8-hour day of simulated work activity |
| Duration?        | 15 days |

*Intervention Biases:* Circle yes or no and explain, if needed.
Contamination

YES/NO

Co-intervention

YES/NO

Timing

YES/NO

Site

YES/NO

Use of different therapists to provide intervention

YES/NO

MEASURES AND OUTCOMES

Complete for each relevant measure when answering the evidence-based question:
Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article – yes/no/NR [not reported]), and how frequently the measure was used.

First Report of Injury (FROI): Job Productivity and Quality of Work; reliability and validity were not reported; daily for 15 days

Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article – yes/no/NR [not reported]), and how frequently the measure was used.

Symptom Survey measured musculoskeletal, visual pain, and discomfort and task performance; reliability and validity were not reported; hourly (7x) every day for 15 days.

Measurement Biases

Were the evaluators blind to treatment status? Circle yes or no, and if yes, explain.

YES/NO

Recall or memory bias. Circle yes or no, and if yes, explain.

YES/NO
RESULTS
List results of outcomes relevant to answering the focused question
Include statistical significance where appropriate (p < 0.05)
Include effect size if reported

- The Minimally Trained (MT) group experienced a higher number of musculoskeletal symptoms than the Ergonomic Trained (ET) group (p < .05; p < .01).
- By day 3, the MT group was experiencing musculoskeletal symptoms in the lower back, left upper/lower neck, and right shoulder. (p < .05; p < .10).
- The MT group experienced more symptoms across the hourly reports than the ET group (p < .05; p < .01).
- The MT trained group experienced more symptoms under the moderate-high work demand level.
- The MT trained group reported more visual symptoms, such as difficulty focusing and blurry vision (p < .05).
- Both groups completed the about the same number of faxes each day, but the ET group had a higher quality control score (p > .05).

Was this study adequately powered (large enough to show a difference)? Circle yes or no, and if no, explain.

YES/NO The study only contained 22 females, which is not a large enough or diverse enough sample size to generalize for all office workers.

Were appropriate analytic methods used? Circle yes or no, and if no, explain.

YES/NO

Were statistics appropriately reported (in written or table format)? Circle yes or no, and if no, explain.

YES/NO
CONCLUSIONS
State the authors’ conclusions that are applicable to answering the evidence-based question.

This study provides strong support for ergonomic training to reduce musculoskeletal discomfort and visual difficulties. This study also provides support that ergonomic training can help employees to increase their productivity during the day. Participants of this study gained significant knowledge about ergonomics training. Participants also effectively transferred the training program appropriately and effectively adjusted their workstations to reduce discomfort and increase job performance. This study provided guidance for the field of occupational health and safety and will contribute to the knowledge of office-based ergonomics.

This work is based on the evidence-based literature review completed by Ashley Northrop, OTS, and Ondo Bennett, PhD, OTR/L, Faculty Advisor, Keuka College.


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