Yoga as a Complimentary Therapy to Reduce Cancer Related Fatigue (CRF) among Adults Impacted by Anti-Cancer Treatment: A Literature Review
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Purpose
The purpose of this literature review is to evaluate the effectiveness of yoga in decreasing cancer-related fatigue (CRF) among adults impacted by treatment for a cancer diagnosis.

Background
Cancer-related fatigue (CRF) - Occurs in up to 80-90% of patients receiving chemotherapy and radiation. 4 - Defined as a “distressing, persistent, subjective sense of physical, emotional, and/or cognitive tiredness or exhaustion related to cancer or cancer treatment that’s not proportional to recent activity and interferes with usual functioning.” - National Cancer Institute. 9 - New cases of cancer are estimated to reach 21.4 million per annum globally by the year 2030. 14

Yoga - According to Oncology Nursing Society (ONS), many cancer centers across the United States offer yoga as an adjunct to conventional cancer treatment. 7 - There is a growing body of evidence supporting that yoga can mitigate fatigue. 3

Methods

Electronic Database Searches:
- PubMed and CINAHL were searched in June 2019.
- Search terms: yoga, cancer, fatigue, cancer fatigue, & neoplasms.
- Search limits: published in English, full text available, published within 10 years.
- Yielded approximately 150 articles of relevance.
- Three systematic reviews and nine randomized control trials were selected.

Study

<table>
<thead>
<tr>
<th>Study</th>
<th>Location</th>
<th>Design</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ben-Joseph et al.</td>
<td>University of Pennsylvania, U.S.A.</td>
<td>Randomized Phase II Study</td>
<td>Prostate cancer patients who completed yoga reported less fatigue (p = 0.001)</td>
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<tr>
<td>Bower et al.</td>
<td>University of California Los Angeles, U.S.A.</td>
<td>Randomized Controlled Trial (RCT)</td>
<td>Fatigue declined from baseline to post-yoga (p = .032)</td>
</tr>
<tr>
<td>Caulin et al.</td>
<td>University of Texas, MD Anderson Cancer Center, U.S.A.</td>
<td>Randomized Controlled Trial (RCT)</td>
<td>Participating in Iyengar yoga program (75p) during chemotherapy: modest short-term benefits with sleep quality and long-term benefits noted over time (who practiced yoga for 4 weeks)</td>
</tr>
<tr>
<td>Kramer et al.</td>
<td>U.S.A.</td>
<td>Cochrane Library Systematic Review</td>
<td>Positive effect on the yoga intervention (SMD -0.48, 95% CI -0.75 to -0.20)</td>
</tr>
<tr>
<td>Dong et al.</td>
<td>Soochow University, Suzhou, People’s Republic of China</td>
<td>Randomized Controlled Trial (RCT)</td>
<td>2,183 participants; yoga had slight, yet statistically significant effect on decreasing fatigue in cancer patients</td>
</tr>
<tr>
<td>Gritz et al.</td>
<td>Munich, Germany</td>
<td>Randomized Controlled Trial (RCT)</td>
<td>Yoga (YI) may have beneficial effects on QOL issues in women with stage I-II breast cancer during neoadjuvant cytotoxic; no significant difference in CRF</td>
</tr>
<tr>
<td>Sadja et al.</td>
<td>San Diego, U.S.A.</td>
<td>Systematic Review of Randomized Controlled Trials (RCT)</td>
<td>Yoga may be beneficial for reducing CRF among breast cancer patients</td>
</tr>
<tr>
<td>Sohl et al.</td>
<td>Vanderbilt University Medical Center &amp; Wake Forest School of Medicine, U.S.A.</td>
<td>Randomized Controlled Trial (Pilot Study)</td>
<td>Yoga Skill Training (YST) is feasible among patients receiving chemotherapy for colorectal cancer</td>
</tr>
<tr>
<td>Sprod et al.</td>
<td>University of North Carolina at Wilmington, U.S.A.</td>
<td>Randomized Controlled Trial (RCT)</td>
<td>Reduced CRF after 4-weeks of YOGAS® program (p = 0.05)</td>
</tr>
<tr>
<td>Shaw et al.</td>
<td>U.S.A.</td>
<td>Randomized Controlled Trial (RCT) Pilot Study</td>
<td>Yoga and strengthening exercises can decrease CRF</td>
</tr>
<tr>
<td>Rau et al.</td>
<td>Kaohsiung City, Taiwan</td>
<td>Randomized Controlled Trial (Pilot Study)</td>
<td>Yoga experimental group benefited significantly more than control (p &lt; .05)</td>
</tr>
<tr>
<td>Vadraj et al.</td>
<td>India</td>
<td>Randomized Controlled Trial (RCT)</td>
<td>Yoga reduces fatigue frequency (p = 0.001), fatigue severity (p &lt; 0.001)</td>
</tr>
</tbody>
</table>

Conclusions
- The range of p values was .0001 to .05.
- Outcomes support yoga’s effectiveness on CRF among breast cancer patients and survivors.
- Results lack in agreement of statistical significance, implications in clinical practice, and data involving participants with multiple forms of cancer.

Implications for Practice
- Evidence supports yoga is a beneficial complementary therapy for alleviation of CRF for patients impacted by breast cancer and survivors of breast cancer.
- Further research is warranted to evaluate if other cancer patient populations have similar outcomes.

Acknowledgments
- Mary Ann Cantrell PhD, CNE, FAAN
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References

Inserting Shapes

• “Insert” “Shape” and then “Insert” “Text Box” inside shape (make Heading and Body in different Text Boxes) for more stylistic design
• Right click within shape to “Format Shape” to change color of background/fill
• Do not “fill” color of text box, only the shape

Color Schemes
Paletton.com can help to find suitably matched/complementary primary and secondary colors (outer band of circle) and color saturation/intensity (inside circle) to be used for filling shapes (you cannot change the background color of poster). First, pick the number of colors at the top left of the screen. Once you determine the preferred RBG color numbers (click within the right-handed square box for color info to find the Red, Blue, and Green numbers of each shade), you can select the corresponding color under “Format” and “Shape Fill.” look for “More Fill Colors” and enter color numbers from Palleton.com color box.

Photographs

• Inserting photos: copy and paste or “Insert” “Picture” to pull in from saved file.
• Click on “Format” tab after clicking on photo to put on frames or other stylistic improvements.
• Public Domain photos- Google: “Images” - put in search- “Settings” - “Advanced Search” - change “Usage Rights” to images “free to use or share, even commercially”, click on the photo, then right click to copy or save to insert into poster. Public Domains Wikimedia Commons or Creative Commons are good options.
• Should not increase size of photo once inserted, because it will then decrease the quality of image.

Lists, Processes, Cycles, And More

Choose favorite design, change background fill as needed, and enter text

“Insert” “Smart Art” to visually demonstrate concepts such as:

Graphs

• Risk of pixilation issue/blurriness if pulled in as a picture from another program. Instead, “Insert,” “Chart” and pick type of graph. It will open an Excel spreadsheet to enter data.
• Under “Design” tab, you can change the appearance of the graph
• Click on one of the bars of the graph and then right click- format series and change the solid fill to another color to adjust to color style of poster
• Click on legend or x/y axis headings and then increase font size from “Home” tab as needed
• Click on graph lines and press “delete” key to remove lines in the back of the graph as needed
• In “Layout” tab after clicking on graph- can create a chart title (change font size same as legend), change title of x/y axis, move location of legend, and put data numbers inside of each data set
• Try not to duplicate date (so if you have the data numbers within the bars, you do not need it on the axis as well)
• Do not include all data results but just the most important ones