

Effects of exercise interventions on cancer-related fatigue in breast cancer patients An overview of systematic reviews

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Published in:
Supportive Care in Cancer

DOI:
[10.1007/s00520-022-07389-5](https://doi.org/10.1007/s00520-022-07389-5)

Published: 01/12/2022

Document Version
Publisher's PDF, also known as Version of record

[Link to publication](#)

Citation for published version (APA):

Zhou, H. J., Wang, T., Xu, Y. Z., Chen, Y. N., Deng, L. J., Wang, C., Chen, J. X., & Tan, J. Y. (2022). Effects of exercise interventions on cancer-related fatigue in breast cancer patients: An overview of systematic reviews. *Supportive Care in Cancer*, 30(12), 10421-10440. <https://doi.org/10.1007/s00520-022-07389-5>

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Analysis of participant-rated feasibility and acceptability of an online, theory-based pre-drinking behavioural intervention

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ABSTRACT

To date, few interventions have been developed to target pre-drinking specifically. An online, theory-based intervention by Caudwell et al. (2018) showed reductions in pre-drinking alcohol consumption and alcohol-related harm, albeit independent of the intervention component/s used. Information about feasibility and acceptability of pre-drinking interventions may therefore be an important point of focus in refining and developing effective interventions. The present manuscript investigates how participants ($N = 117$) in Caudwell et al. (2018) rated the intervention in terms of feasibility and acceptability. A feasibility and acceptability measure was factor analysed and investigated in relation to participant scores on theory-based measures (e.g., attitude, goal self-concordance), as well as demographic and alcohol consumption variables measured at baseline. Results indicate participants with higher scores on theory-based measures related to behaviour change and goal self-concordance at baseline rated the intervention more positively at follow-up. The findings indicate future intervention research should consider stages of change, with broader alcohol policy and public health strategy focused on changing attitudes toward pre-drinking, which remains a popular health-risk behaviour.

Pre-drinking has been a topic that has generated much interest from social psychology and public health in the last 15 years. Research has focused on exploring cultural and demographic variables, contextual factors (e.g., the presence of others), the location of the pre-drinking and subsequent event, the nature of alcohol consumption, and - most extensively - motivations for engaging in pre-drinking behaviour (Foster & Ferguson, 2013; Hughes & Devilly, 2020). The breadth and depth of these findings have provided a strong foundation to inform interventions to reduce pre-drinking at both the individual and policy levels (Pedersen, 2016). To date, a small number of intervention studies have been published (Caudwell & Hagger, 2021), mainly adapting existing alcohol interventions and behaviour change techniques that have been successful in other contexts. Two such interventions have been conducted with university samples in the USA. For instance, Borsari et al. (2016) tested a brief motivational intervention against assessment only, and found no differences between groups in relation to pre-drinking frequency. Zamboanga et al. (2019) trialled a web-based alcohol intervention (*myPlaybook*) in student athletes, finding no effect on pre-drinking outcomes (though this was not a primary focus of the intervention). These authors posit that participants may be unable to extrapolate beyond generic alcohol intervention components to pre-

drinking contexts, and that tailored, pre-drinking-specific interventions may be more effective.

Caudwell et al. (2018) developed a psychological theory-based intervention to target pre-drinking alcohol consumption specifically in a sample of Australian undergraduate students. The intervention targeted motivational and volitional action phases of behaviour, with the expectation that the combination of motivation (i.e., autonomy support) and planning (i.e., implementation intention) components would lead to more substantial reductions in pre-drinking outcomes than either component delivered alone, compared to neither component being delivered (for further details, see Caudwell et al., 2016). Participants were randomly allocated to conditions where motivation and planning components were present or absent, with all participants receiving National Guidelines on reducing the risk of alcohol-related harm at baseline, in an email summary following the intervention, and each week via SMS over four weeks, prior to follow-up (participants receiving motivation and planning components received tailored SMS messages, respectively). Again, no significant effect of component on outcome measures was found. Regardless of intervention component, participants reduced alcohol consumption and experienced fewer incidents of alcohol-related harm in the four weeks following the intervention.

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<https://doi.org/10.1016/j.addbeh.2022.107568>

Received 18 March 2022; Received in revised form 14 November 2022; Accepted 17 November 2022

Available online 30 November 2022

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Given the need to develop effective pre-drinking specific interventions, and lack of success stemming from the initial endeavours to do so, it is important to investigate participants' perceptions of the acceptability and feasibility of a targeted pre-drinking intervention to shape future interventions that are developed in the pre-drinking context. The current short communication reports analyses using the feasibility and acceptability data collected in Caudwell et al., (2018) at follow-up ($N = 117$; $M_{\text{age}} = 20.86$ years; $SD_{\text{age}} = 3.89$ years). The feasibility and acceptability measure has been previously used to evaluate dietary interventions (Sainsbury et al., 2015). Within the measure, items followed a common stem (e.g., "I thought the intervention was...") with 8 descriptors ("personally relevant", "interesting", "helpful/useful", "worthwhile", "easy to understand", "too long", "too short", "annoying"), rated on Likert scales 1 ("I don't agree at all") to 5 ("I totally agree"). The dimensionality of the measure was evaluated and correlated with other intervention variables.

1. The effect of intervention component on feasibility/acceptability

A series of ANOVA were conducted using condition (i.e., autonomy support: present/absent; implementation intention: present/absent) as a between-participants factor, and each of the feasibility/acceptability items as a dependent variable.¹

Non-significant main effects and interactions were observed for *Personally Relevant* ($ps > 0.294$), *Interesting* ($ps > 0.175$); *Helpful/Useful* ($ps > 0.256$), *Worthwhile* ($ps > 0.659$); *Easy to Understand* ($ps > 0.446$); *Too Short* ($ps > 0.235$); and, *Annoying* ($ps > 0.266$). There were no significant main effects nor interactions for the summed feasibility/acceptability score, $F_s < 1.01$; $ps > 0.130$.

A significant main effect was observed for autonomy support: present/absent, $F(1,117) = 4.90$, $p = .029$, $\eta_p^2 = 0.042$. Participant mean scores for *Too Long* were slightly higher for those who received the autonomy support component ($M = 2.29$, $SE_M = 0.133$) than those who did not ($M = 2.08$, $SE_M = 0.126$), likely due to the nature of the component comprising a series of autonomy-supportive writing prompts. The main effect for implementation intention: present/absent was not significant, nor was the interaction ($ps > 0.578$). Given the overwhelming pattern of results, and the lack of significant effects for the intervention components on outcome variables (Caudwell et al., 2018), data were collapsed across conditions for further analyses in relation to feasibility and acceptability to help refine the development of future pre-drinking interventions.

2. Factor analysis of the feasibility/acceptability measure

A factor analysis was conducted to investigate the psychometric properties of the feasibility/acceptability measure. Both the Kaiser-Meyer-Olkin measure of sampling adequacy (0.76) and Bartlett's test $\chi^2(28) = 338.21$, $p < .001$ indicated the feasibility/acceptability items were suitable for factor analysis. Oblimin rotation revealed a two-factor solution that explained 47.88 % of the variance amongst the items; *helpful/useful* (0.91), *worthwhile* (0.90), *interesting* (0.75), *personally relevant* (0.64) items loaded on one factor ("positive"), whereas *too long*, *too short*, and *annoying* items loading on the other ("negative"); this structure was adopted and variables created to indicate positive and negative evaluation. The *easy to understand* item did not load strongly on either factor, but appeared thematically consistent with the *positive* factor and as such was included within it. Given it was unlikely a participant would score the intervention similarly for *too long* and *too*

¹ We also conducted a MANOVA with all feasibility/acceptability items as dependent variables, and condition as a between-participants variable. The MANOVA was not statistically significant, $F(24, 324) = 0.943$, $p = .543$, $\eta_p^2 = 0.065$.

short, these items and *annoying* were reverse-coded and included in a total score. Given the exploratory nature of these analyses, results are reported based on individual item scores, averaged item scores (i.e., positive [including *easy to understand*], negative), as well as the total summed score of positive and reverse-coded negative items (see Table 1). Based on the percentage agreement, the majority of participants found the intervention easy to understand. Responses were fairly balanced for the remainder of positively phrased items, with low agreement that the length of the intervention was inappropriate or that it was annoying (see Table 1).

3. Correlational analyses

Spearman's rho correlations were computed for each of the feasibility/accountability statistics by theory-based measures at baseline (see Table 2). Statistically significant and positive correlations were observed between baseline attitudes and intentions (i.e., towards reducing pre-drinking alcohol consumption behaviour), and *personally relevant*, *helpful/useful*, and *worthwhile*. Correlations between total and positive scales and these variables indicate a similar pattern – that participants with more positive attitudes and intentions toward behaviour change found the intervention more feasible and acceptable. Participants who believed they had more control over reducing pre-drinking over the next four weeks also appeared to understand the purpose of the intention, as evidenced by significant negative correlations between perceived behavioural control and the *easy to understand*, *too long*, and *too short* items, as well as the negative scale. Higher goal self-congruence showed broadly consistent results, with participants who scored higher on this measure reporting that the intervention was less *annoying*.

Finally, feasibility/acceptability measures were correlated with gender (dummy-coded), age, AUDIT-C items and total score, pre-drinking in the week prior to the intervention, and typical pre-drinking metrics (i.e., typical pre-drinking sessions per month, typical pre-drinking alcohol consumption, typical pre-drinking expenditure), as well as typical alcohol expenditure not including pre-drinking but on a pre-drinking occasion, and typical total alcohol consumption on a pre-drinking occasion. Most correlations were non-significant, save for positive correlations between gender (male) and *too short* ($\rho = 0.23$, $p = 0.014$), and *negative* ($\rho = 0.21$, $p = .023$); and the third AUDIT-C item (i.e., *How often do you have six or more drinks on one occasion?*), which was positively correlated with *personally relevant* ($\rho = 0.19$, $p = .041$), and negatively correlated with *easy to understand* ($\rho = -0.22$, $p = .019$).

4. Discussion and conclusion

Despite the non-significant differences between intervention conditions, the time effect of the intervention suggests there may be merit in considering participant perceptions of the intervention in relation to its feasibility and acceptability, to help inform future intervention

Table 1

Descriptive statistics and percentage agreement on feasibility/acceptability items, total score, and averaged composite scores.

	<i>M</i>	<i>SD</i>	<i>Med.</i>	Agreement ^a
Personally relevant	3.01	1.28	3.00	38.46 %
Interesting	3.40	1.07	4.00	56.41 %
Helpful/useful	3.14	1.19	3.00	47.01 %
Worthwhile	3.32	1.16	3.00	47.86 %
Easy to understand	4.36	0.86	5.00	88.03 %
Too long	2.27	1.00	2.00	11.11 %
Too short	2.13	0.92	2.00	5.13 %
Annoying	2.13	1.00	2.00	11.11 %
Total	28.69	5.23	29.00	NA
Positive	3.44	0.86	3.60	NA
Negative	2.18	0.73	2.33	NA

Note. *M* = mean; *SD* = standard deviation; *Med.* = median. ^abased on count of '4' and '5' scores on a 5-point Likert-type response scale.

Table 2

Correlations (Spearman's ρ) between feasibility/acceptability items, total score, composite scores, and theory-based measure scores at baseline.

	PDAC	B-YAACQ	Att	PBC	Int	Plan	GSC
Personally Relevant	-0.01	0.14	0.35 ^c	-0.11	0.24 ^a	0.02	0.11
Interesting	-0.06	-0.04	0.15	0.04	0.12	-0.02	0.12
Helpful/Useful	-0.07	<0.01	0.36 ^c	-0.14	0.26 ^b	-0.03	0.16 ^c
Worthwhile	-0.03	0.09	0.39 ^c	-0.11	0.30 ^b	-0.03	0.13
Easy to understand	0.02	-0.02	<0.01	0.24 ^b	-0.04	0.05	0.02
Too long	-0.08	0.02	-0.03	-0.20 ^a	0.01	-0.08	-0.17 ^c
Too short	-0.08	0.07	0.04	-0.18 ^a	0.02	-0.10	0.13
Annoying	0.14	0.01	-0.14	-0.12	-0.02	-0.12	-0.19 ^a
Total	-0.04	0.02	0.28 ^b	0.04	0.18 ^a	0.03	0.16
Positive	-0.05	0.04	0.34 ^b	-0.03	0.24 ^a	0.01	0.14
Negative	<0.01	0.04	-0.04	-0.20 ^a	0.02	-0.12	-0.12

Note. ^a $p < 0.10$; ^b $p < 0.05$; ^c $p < 0.001$. PDAC = pre-drinking alcohol consumption; B-YAACQ = brief young adult alcohol consequences questionnaire; Att = attitude; PBC = perceived behavioural control; Int = intention; Plan = planning; GSC = goal self-concordance.

development in this space. Although interventions to date have been unsuccessful in eliciting changes in pre-drinking outcomes through behaviour change techniques or empirically-supported approaches in other alcohol consumption contexts, results of these analyses suggest that the beliefs of individuals are important factors to consider when developing targeted pre-drinking interventions. For instance, though participants on average reduced pre-drinking alcohol consumption and experienced less alcohol-related harm between baseline and follow-up regardless of intervention condition, those who were more motivated to change behaviour (i.e., holding more positive attitudes, higher perceptions of control, and stronger intentions toward reducing their pre-drinking behaviour) and who saw this behaviour change goal as more congruent with their sense of self, tended to rate the intervention more positively and less negatively.

These findings are broadly consistent with work by Schulz et al. (2012), who sought to apply the De Vries and Backbier (1994) \emptyset -pattern of beliefs that accompany the various stages of change, as outlined in the transtheoretical model (Prochaska & Velicer, 1997) to alcohol consumption. Schulz et al. compared *pre-contemplation*, *contemplation/preparation*, and *action/maintenance* groups of participants on their evaluations of the intervention. Mean scores were higher for participants in the *contemplation/preparer* stage, than both those in the *pre-contemplation* stage, and the *action* stage. The authors recommend stage-matched interventions that are appropriate for individuals in different motivational stages. Correlation analyses in the present study indicated that individuals who consumed alcohol more frequently rated the intervention as more personally relevant, which suggests that some participants could be characterised by the *pre-contemplation/contemplation* stage. Given the popularity of pre-drinking behaviour as an ancillary form of alcohol consumption behaviour, that is at least initially intentional (MacLean & Callinan, 2013), future interventions should seek to use this approach to identify the participants most likely to respond to a behaviour change intervention. The current research indicates that these individuals may be in position to consider an intervention as more acceptable and feasible, and therefore may be more motivated to change their behaviour, which may reveal significant effects of behaviour change techniques beyond that attributable to the provision of common health-related information and measurement of alcohol consumption behaviour (Kypri et al., 2007).

Overall, these supplementary analyses give some indication that the implementation of pre-drinking behaviour change may also warrant policy change at broader levels, to promote awareness of pre-drinking as a risky behaviour (Labhart et al., 2017). Doing so may create a context for attitude change, which would facilitate the formation of stronger intentions to change behaviour. This in turn may lead individuals through the stages of change, whereby they would likely seek out and better engage with pre-drinking interventions. These points notwithstanding, however, more work is required to establish the contribution of effective theory-based interventions that use valid behaviour change techniques in this context.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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