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If They'd Said You Should Only Drink Five Units I'd Have Listened: A Mixed Methods Study of Alcohol Consumption Following a Diagnosis of Breast Cancer

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ABSTRACT

Objectives: As part of a wider study describing the impact of a breast cancer diagnosis on lifestyle behaviours, this paper describes the impact of a breast cancer diagnosis on alcohol consumption and factors influencing consumption.

Methods: Cross-sectional online survey of 140 people (138 women) and interviews with 21 women diagnosed with breast cancer in the last 10 years.

Results: Of the 100 survey participants who drank alcohol 25% were drinking at increasing or higher risk levels and 17% strongly wanted to change their drinking behaviour. The habitual aspects of alcohol consumption were the strongest predictor of current alcohol consumption behaviours. Social norms and perceptions about conflicting information were substantial barriers to change.

Conclusions: Breast cancer survivors need accurate information about the risks of alcohol consumption and guidelines in order to make informed decisions about making changes to their behaviour. Interventions to support breast cancer survivors to reduce alcohol consumption need to focus on the development of healthy habits and may benefit from a focus which includes partners and friends.

1 | Introduction

Breast cancer is the most prevalent cancer in the world and the biggest cause of cancer death in women [1]. Advances in detection and treatment mean that survival rates have increased, with the 5 and 10 year survival rates in the UK at 85% and 75% respectively [2]. Thus, there are growing numbers of breast cancer survivors, and for many treatment will significantly impact their physical and mental health [3]. There is a need to explore ways to support breast cancer survivors live healthy lifestyles. One important focus is alcohol consumption. Alcoholic drinks contain ethanol, a known carcinogen [4].

Alcohol consumption is an established risk factor for a diagnosis of breast cancer [5], but evidence is still building regarding recurrence. A review of cohort studies suggested that >1 drink daily was associated with increased recurrence in oestrogen-receptor positive survivors [6]. Other evidence suggests that >7 alcoholic drinks per week is associated with contralateral breast cancer [7] and a further review showed recurrence, as

well as secondary cancers, associated with alcohol consumption [8]. Evidence is still inconclusive regarding the impact of post diagnosis alcohol consumption on all cause and breast cancer specific mortality [9]. Other risks of alcohol consumption are the same as for people without breast cancer, including heart disease, stroke, injuries and poor mental health [10].

Guidance for the UK general population is that there no 'safe' level of alcohol consumption, but to reduce risks, people should consume no more than 14 units (1 unit = 10 mL) of alcohol per week [11]. The World Cancer Research Fund recommends that breast cancer survivors limit or avoid alcohol consumption [12]. Recent National Institute for Health and Care Excellence (NICE) guidance recommends breast cancer survivors limit to five units per week [13].

Little is known about alcohol consumption in breast cancer survivors. One review suggested breast cancer survivors drank at the same level as the general population [8]. A USA study found that 29% of breast cancer survivors drank in excess of general population guidelines [14]. Breast cancer survivors can experience barriers to behaviour change, including fatigue and stress [15]. Existing lifestyle interventions within breast cancer screening programmes sometimes include alcohol as a very brief component [16], but evidence is needed about specific barriers and facilitators to alcohol behaviour change in breast cancer survivors.

We employed an overarching model of behaviour—the COM-B model—to explore barriers and facilitators. The COM-B model proposes that behaviour is the result of a dynamic combination of an individual's capability, opportunity, and motivation [17]. Capability may be physical (skill, strength) or psychological (knowledge, psychological stamina); opportunity may be physical (environment, resources) or social (norms, interpersonal influences); motivation may be reflective (plans, conscious intentions) or automatic (habits, impulses) [18]. Understanding which COM-B components influence alcohol consumption can aid in the development of targeted interventions for breast cancer survivors [19].

1.1 | Aims

1. To describe alcohol consumption following a breast cancer diagnosis.
2. To explore associations between capability, opportunity, motivation and alcohol consumption.
3. To explore barriers and facilitators to reducing alcohol consumption.

2 | Methods

2.1 | Design

The study employed a mixed methods concurrent design [20] using an online survey and individual interviews. While participation in interviews followed survey participation, the data were collected concurrently and analysed at the same timepoint. We consulted with patient contacts from local breast cancer support groups on our research and incorporated feedback into study materials. This study was part of a larger project, exploring diet, physical activity, and smoking, registered on the Open Science Framework [21]. Ethical approval was granted by the host institution (ref 211553). Participants provided written informed consent both at the start of the survey and interviews.

2.2 | Participants

Eligible participants were aged 18+ residing in the UK, of any gender, self-reporting as diagnosed with breast cancer (excluding metastatic) within the last 10 years (prior to 2022 when data were collected) and completed active hospital based treatment—but could be receiving hormone therapy. The 10 year cut off was used to ensure accurate recall of behaviour. To recruit we used social media, existing patient contacts, cancer support groups, alcohol support organisations, and cancer charities.

2.3 | Survey Sample

In total, 224 people began the survey, however 83 did not submit their response. One person was excluded as they were diagnosed outside of the last 10 years, leaving a final of $n = 140$ (see Table 1 for participant characteristics). Almost all (138/140) participants were women, with one man and one selecting 'prefer to self-describe'. Most participants had a high level of education, with 78% having either an undergraduate or post-graduate degree. The majority (95%) were White.

2.4 | Survey Measures

The full questionnaire can be seen in Supporting Information S1.

Breast cancer diagnosis: Closed questions probed year of diagnosis and type of treatment.

Behaviour change: Participants rated their agreement with the following statement: Since your breast cancer diagnosis/treatment, have you changed the quantity of your alcohol consumption? Response were from *a lot* less to *a lot more*; this measure was taken from another study [22].

Alcohol: The 10 item Alcohol Use Disorders Identification Test (AUDIT; [23]) is a widely used validated scale to assess alcohol consumption and risk of dependence. Scores range from 0 to 40 and scores are categorised as lower risk (0–7), increasing risk [8–15], higher risk [16–19] and possible alcohol dependence (20+). This scale has been used in other studies with breast cancer patients [24] and had good reliability (10 items; $\alpha = 0.742$).

Desire to change alcohol consumption was assessed by agreement (from 1—strongly disagree to 7—strongly agree) to the statement: *I would like to reduce my alcohol consumption.*

TABLE 1 | Characteristics of survey respondents, current drinking behaviour, change since diagnosis, motivation to change in the future and what would prompt behaviour change for survey respondents ($N = 140$).

Participant characteristic	*N* (%)
Age	
Under 40	4 (3%)
40–49	26 (19%)
50–59	73 (52%)
60–69	30 (21%)
70–79	7 (5%)
Ethnicity	
White	117 (95%)
Mixed or multiple	1 (1%)
Asian/Asian British	2 (2%)
Any other	3 (2%)
Education	
GCSE/O levels	13 (9%)
A levels	16 (11%)
Undergraduate	47 (34%)
Postgraduate	61 (44%)
Other	3 (2%)
Years since diagnosis (year of diagnosis)	
0 (2022)	
0 (2022)	10 (8%)
1 (2021)	33 (26%)
2 (2020)	20 (16%)
3 (2019)	9 (7%)
4 (2018)	15 (12%)
5 (2017)	11 (9%)
6 (2016)	8 (6%)
7 (2015)	8 (6%)
8 (2014)	6 (5%)
9 (2013)	5 (4%)
10 (2012)	3 (2%)
Treatment[a]	
No treatment	1 (0.7%)
Mastectomy	73 (51.77%)
Lumpectomy	74 (52.85%)
Radiotherapy	113 (80.71%)
Chemotherapy	76 (53.90%)
Hormone therapy	114 (81.42%)
Self reported health	
Excellent	18 (13%)
Very good	67 (48%)
Good	40 (29%)
Fair	14 (10%)
Poor	1 (1%)
Drinker status	
Non-drinkers	40 (28.6%)
Current drinkers	100 (71.4%)
AUDIT categories of current drinkers	
Low risk	75 (75%)
Increasing risk	23 (23%)
Higher risk	1 (1%)
Possible dependence	1 (1%)
Change since diagnosis	
I did not drink before my diagnosis and do not drink now	21 (15%)
I do not drink at all now	19 (14%)
I drink a lot less now	36 (26%)
I drink a little less now	28 (20%)
I drink about the same	32 (23%)
I drink a little more now	4 (3%)
I drink a lot more now	0
	Current drinkers ***n* = 100**
Would like to change in the future	
1—Strongly disagree	23 (23%)
2	13 (13%)
3	9 (9%)
4	17 (17%)
5	12 (12%)
6	9 (9%)
7—Strongly agree	17 (17%)
What would prompt behaviour change?[b]	
To follow health advice given after cancer diagnosis	46 (46%)
To prevent illness, to keep in good physical health	62 (62%)
To protect my mental health	36 (36%)
For reasons relating to family	8 (6%)
To prevent recurrence of cancer	67 (67%)
For work-related reasons	3 (3%)
For reasons relating to friends	3 (3%)
For financial reasons	10 (10%)
Other (please state)	Weight loss

[a]Treatment for breast cancer often involves multiple aspects, hence % greater than 100.
[b]Multiple options could be selected.

Self-reported health was assessed by one item—*Would you say your health in general is excellent, very good, good, fair or poor?* This item was taken from another study of breast cancer patients [25].

COM-B items were based previous research on alcohol consumption in the general population [26]. Items were adapted to be applicable to our sample after piloting with two patient advisors for example by changing the phrase 'automatically' to 'consciously without thinking about it' for automatic motivation.

Psychological capability: Knowledge of current NHS alcohol guidelines (e.g., that low risk drinking is considered to be no more than 14 units on a regular basis) was assessed. The correct guideline was then provided, so that following questions could be answered accurately.

Physical opportunity: Participants rated their agreement (from 1—strongly disagree to 7—strongly agree) to the statement: *I have sufficient time and opportunity (e.g., access to social events without alcohol) to reduce my alcohol consumption*.

Social opportunity: Participants rated their agreement (from 1—strongly disagree to 7—strongly agree) to two statements: *Most people in my social network drink less than 14 units each week* (descriptive norm) and *most people in my social network want me to drink less* (injunctive norm).

Reflective motivation: Participants rated their agreement (from 1—strongly disagree to 7—strongly agree) to two statements: *I believe that drinking less alcohol would be beneficial for my overall health and I intend to drink less than 5 units of alcohol each week*.

Automatic motivation: Participants rated their agreement (from 1—strongly disagree to 7—strongly agree) to two statements with the stem 'drinking alcohol is something' (a) I do without consciously thinking about it and (b) that belongs to my daily routine.

Participants then viewed a range of possible reasons (e.g., to follow health advice—see Table 1 for all), which might prompt them to make changes to their alcohol consumption, and were asked to select all that applied.

2.5 | Interview Sample

In total 79 women left an email address to indicate their interest in taking part in an interview. We purposively selected women with higher AUDIT scores (4+) and/or those who indicated they were either drinking more or less alcohol since diagnosis. Of the 25 contacted, 21 agreed to an interview. Interviews took place between October 2022 and April 2023, lasted for an average 63 min, (range 28–100) and were conducted by four authors (L. Mc.G., J.B., L.M. and J.Br.) via Zoom ($n = 12$) or telephone ($n = 9$). Interviews were audio recorded, and transcribed verbatim. The interview followed a semi-structured interview schedule, with a focused section on alcohol and including sections about healthy eating and physical activity as part of the larger study (see Supporting Information S2). Questions probed changes made to lifestyle, information and support, motivation for change, perceived barriers and facilitators to change.

2.6 | Analysis

2.6.1 | Survey

We explored drinking behaviours, change since diagnosis and motivations to change using descriptive statistics. Spearman correlations explored associations between drinking behaviours, each COM-B component and demographics, as the data was non-parametric. We applied a Bonferroni correction to the correlation *p*-values and only co-variates significantly correlated with AUDIT and the COM-B components were entered into regression models. Linear regression modelling explored predictors of AUDIT score and predictors of desire to change alcohol consumption.

2.6.2 | Interviews

Data were analysed thematically with the aid of NVivo v 20, following the framework approach [27]. Data analysis involved reading through the transcripts to increase familiarity. Three transcripts were coded for items of data relating to the research questions. The coding process was initially performed by one researcher (L.Mc.G.) and checked for consistency by a second (L.M.). Once initial codes were agreed, all transcripts were coded independently by three researchers (L.Mc.G., L.M. and S. M.). Themes were then generated from the coded data by L.Mc. G. and L.M., and reviewed and refined until a coherent narrative of the women's experiences was produced.

3 | Results

3.1 | Descriptive Statistics

In the survey sample 71.4% were current drinkers ($N = 100$) and, of those, 25% were classified as increasing or higher risk drinkers (Table 1). Nineteen (14%) had stopped drinking since their diagnosis, and 46% reported drinking a lot less ($N = 36$) or a little less ($N = 28$) than before their diagnosis. A further 23% were drinking about the same amount and 3% were drinking more. Seventeen percent strongly agreed that they would like to change their drinking behaviour; desire to change was strongly correlated ($r = 0.738$) with higher AUDIT scores. The most common reason for behaviour change was to prevent breast cancer recurrence (67%).

3.2 | Correlations

AUDIT scores were significantly correlated with social opportunity, physical opportunity, automatic motivation, desire to change, and change since diagnosis. For example, AUDIT was negatively correlated with physical opportunity (Table 2), suggesting those with more access to alternatives to drinking were drinking less. AUDIT was positively correlated with automatic motivation, suggesting the more habitual drinking was, the

more respondents were consuming. AUDIT scores were not correlated with psychological capability, reflective motivation, age, years since diagnosis, or self-reported health. Desire to change alcohol consumption was positively correlated with reflective and automatic motivation and self-reported health, suggesting that the more habitual drinking was, the more motivated they were to drink at healthy levels, as well as the healthier they felt, the more respondents wanted to reduce their drinking. Automatic motivation was also associated with drinking more since diagnosis.

3.3 | Regression Models

The first model significantly predicted AUDIT scores (Table 3), accounting for 32% of the variance (Adj $R = 0.32$, $F(5, 61) = 7.06$, $p < 0.001$). Automatic motivation was the only significant predictor in the model ($\beta = 0.52$, $t = 5.08$, $p < 0.001$), suggesting that the habitual aspects of alcohol consumption were most strongly associated with AUDIT scores over and above other variables. The second model explored predictors of desire to change behaviour (Table 3). This model significantly predicted desire to change, accounting for 60% of the variance (Adj $R^2 = 0.60$, $F(6, 60) = 17.67$, $p < 0.001$). AUDIT ($\beta = 0.65$, $t = 6.70$, $p < 0.001$) and reflective motivation ($\beta = 0.28$, $t = 3.54$, $p < 0.001$) contributed significantly to the model. This suggests that as well as those who are drinking more, those who have reflected on their alcohol consumption to a greater extent are more open to changing their behaviour.

3.4 | Interview Findings

Three themes were identified and named 'alcohol consumption following diagnosis and during treatment'; 'barriers to reducing alcohol consumption after cancer' and 'facilitators to reducing alcohol consumption after cancer'. Interview participant characteristics are shown in Table 4.

3.5 | Alcohol Consumption Following Diagnosis and Throughout Active Treatment

Survey data showed that six interview participants had reduced their alcohol intake a lot; 10 had reduced it a little, and five described drinking at the same level as before. However, in the interviews, most recalled a change in their drinking behaviour immediately after diagnosis and throughout active cancer treatment, and had either cut down their alcohol intake or stopped drinking completely. Explanations included not feeling well enough to drink or a change in taste due to chemotherapy. A few mentioned that they felt fearful about drinking.

> Yeah, so during treatment, no, I didn't drink... and just didn't want it. And I was very frightened, you know, I couldn't look beyond, would I be here next year, would I be here the following year, so you know, really did try to be careful.
>
> (P13)

However, it appeared that the participants' feelings were not in line with the expectations of other people. As P8's quote highlights, alcohol is normalised as the solution to many of life's challenges, including a breast cancer diagnosis.

> My friends were all saying oh, on your diagnosis, here, have a large glass of wine. That seemed to be the sticking plaster for everything.
>
> (P8)

3.6 | Barriers to Reducing Alcohol Intake

The routine aspect of drinking alcohol, reinforced by relationships with partners or friends was an important barrier. For our participants, drinking alcohol was something they had always done before, and returning to pre-cancer drinking behaviours was perhaps a way of returning to normality. Many participants stated that 'you have to live' and implied that they saw drinking

TABLE 2 | Correlations between AUDIT scores, COM-B components and other measures.

	1	2	3	4	5	6	7	8	9	10	11
Mean (SD)											
1. AUDIT											
2. Psychological capability	0.182										
3. Social opportunity	−0.214*	−0.050									
4. Physical opportunity	−0.296**	−0.281*	0.168								
5. Reflective motivation	0.056	−0.192	−0.076	0.022							
6. Automatic motivation	0.572***	0.145	−0.102	−0.212*	0.105						
7. Desire to change	0.738***	0.169	−0.244*	−0.304**	0.379***	0.513***					
8. Years since diagnosis	−0.056	0.012	0.006	0.087	0.162	−0.063	−0.005				
9. Age	0.024	0.106	−0.023	0.019	−0.052	−0.052	0.062	0.170			
10. Self-reported health	0.126	0.001	−0.123	0.019	0.130	0.130	0.102	−0.082	−0.163		
11. Change since diagnosis	−0.245*	−0.211	−0.173	0.061	0.093	−0.311**	−0.231*	−0.302**	−0.034	0.058	

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

TABLE 3 | Results of multiple linear regression models predicting AUDIT scores and desire to change alcohol consumption.

Predictor	Estimate	SE	Lower	Upper	*T*	*p*	*β*
AUDIT score							
Intercept	3.29	2.82	−2.349	8.929	1.167	0.248	
Psychological capability	0.821	0.845	−0.868	2.51	0.972	0.335	0.106
Social opportunity	−0.197	0.213	−0.623	0.23	−0.921	0.361	−0.094
Physical opportunity	−0.341	0.24	−0.821	0.139	−1.422	0.16	−0.154
Reflective motivation	0.154	0.157	−0.161	0.468	0.977	0.333	0.102
Automatic motivation	0.863	0.17	0.523	1.202	5.08	<0.001	0.523
Desire to change							
Intercept	0.415	1.134	−1.854	2.683	0.366	0.716	
AUDIT	0.341	0.051	0.240	0.443	6.703	<0.001	0.654
Psychological capability	0.311	0.339	−0.366	0.988	0.919	0.362	0.077
Social opportunity	−0.006	0.086	−0.177	0.165	−0.070	0.944	−0.006
Physical opportunity	−0.151	0.097	−0.345	0.044	−1.552	0.126	−0.130
Reflective motivation	0.223	0.063	0.097	0.350	3.545	<0.001	0.283
Automatic motivation	0.017	0.081	−0.144	0.178	0.208	0.836	0.019

Note: Model 1: Outcome variable AUDIT score. Predictors entered into the model; Psychological capability, social opportunity, physical opportunity, reflective motivation, automatic motivation. Variance (Adj $R = 0.32$, $F(5, 61) = 7.06$, $p < 0.001$). Model 2: Outcome variable Desire to change: Predictors entered into the model; AUDIT, psychological capability, social opportunity, physical opportunity, reflective motivation, automatic motivation. Variance (Adj $R^2 = 0.60$, $F(6, 60) = 17.67$, $p < 0.001$).

alcohol as part of that. Other barriers included the perceived benefits of drinking alcohol, such as for relaxation, its use as a reward, or for social confidence.

> Yes, if I tend to go out with friends, usually it's going to a pub or a restaurant. So yeah, I think it's years of kind of habit that's formed that's very very hard to throw off really. I guess there's also a little part of me thinks well... there's a danger that your life might be short, you don't want to be miserable either!
>
> (P2)

Barriers also arose in relation to a mistrust of information. Some women were aware of the link between alcohol and cancer and/or recurrence, but others lacked knowledge. Even in those who were aware of the link between alcohol and a primary diagnosis there was a perception that it was not worth ruminating on, as you could not turn back the clock.

> I wouldn't like to live like that, because I just think it's kind of just... Not luck, but if you get it or not is just one of these things. And I wouldn't want to be obsessing about why I got it, because it's done now.
>
> (P7)

As P7 alludes, many participants believed that their diagnosis was either a piece of bad luck, or something they had no control over. In addition, as P9 went on to say, there is conflicting information about alcohol in the public domain.

> I'm not saying it's a myth... but equally I know people that have never drunk in their life and have had breast cancer... But if somebody said to me tomorrow don't ever drink again [Patient] because, then I wouldn't... I mean I'm not saying they're myths, but years ago sometimes they would say oh have a glass of red wine, and that would chop and change. I think all they say is alcohol does not help, or could be a factor. But it's not proven; there isn't anything that is proven.
>
> (P9)

P9 reveals the difficulty of interpreting media information and relating it to a diagnosis. This may serve to reinforce the uncertainty about whether or not reducing alcohol would be beneficial, especially in those who enjoy drinking. Other participants questioned why they had not been given specific advice about their alcohol consumption by health professionals during active treatment.

> If they said you should only drink five units I'd have listened, but nobody ever said anything about that.
>
> (P5)

3.7 | Facilitators to Reducing Alcohol Intake

For some, diagnosis led to retirement or fewer work hours, reducing stress and subsequently alcohol consumption. Other participants noted reduced enjoyment from drinking alcohol following treatment, and others had consciously established new healthy alternatives to drinking.

Another key facilitator for some was having the knowledge of the association between alcohol and breast cancer. However, this was accompanied by feelings of guilt that they were in some

TABLE 4 | Interview participant characteristics ($N = 21$).

ID	Year of diagnosis	Age	Education	Locality	Self-reported health	AUDIT score	Change in consumption since DX
1	2021	60–69	A levels	South Central England	Fair	3	A lot less
2	2021	50–59	Postgraduate	South East England	Very good	11	A lot less
3	2020	50–59	Other	South West England	Excellent	4	A little less
4	2014	40–49	Undergraduate	Wales	Very good	7	A little less
5	2021	50–59	GCSE/O levels	South Central England	Good	11	A little less
6	2020	50–59	Postgraduate	North West England	Good	12	A little less
7	2018	50–59	Undergraduate	Scotland	Very good	6	The same
8	2016	50–59	Undergraduate	Wales	Very good	8	A little less
9	2020	50–59	A levels	South East England	Very good	9	A little less
10	2020	50–59	Postgraduate	North East England	Very good	5	A lot less
11	2018	60–69	Postgraduate	West Midlands	Fair	4	A little less
12	2016	60–69	Other	Yorkshire and Humber	Very good	20	The same
13	2018	50–59	Postgraduate	Wales	Very good	10	The same
14	2015	40–49	Postgraduate	South East England	Good	14	The same
15	2021	50–59	A levels	Scotland	Very good	6	A lot less
16	2013	40–49	Undergraduate	West Midlands	Excellent	6	The same
17	2014	60–69	GCSE/O levels	South East England	Very good	14	A little less
18	2021	60–69	Postgraduate	North West England	Very good	10	A little less
19	2019	50–59	Postgraduate	East Midlands	Very good	2	A little less
20	2018	60–69	Undergraduate	North East England	Very good	6	A lot less
21	2015	60–69	A levels	East Midlands	Very good	2	A lot less

way to blame for getting breast cancer, or fear of causing further harm. These negative emotions led them to cut down their consumption

> Well I suppose in a way you know that the guilt, you know, you can't do anything about what's already happened, but you can make the best choices for your future.... if I enjoy a glass of wine, and then I'm not doing that, I do feel a little bit deprived. I do feel a little bit sad in some ways that I can't just enjoy that freely, but I'm not stupid, I've recognised that I've been given a second chance after the breast cancer, and I don't want to drive into another health issue which is completely avoidable. I mean that would just be silly.
>
> (P14)

Awareness of other negative aspects of drinking were magnified following cancer. These included lower tolerance of the short-term negative impacts (e.g., hangover), ongoing treatment side effects being exacerbated by alcohol and ageing. Additionally, some discussed the impact of alcohol on mental health and sleep quality.

> And since I've been on Tamoxifen [a side effect is hot flushes] I've noticed that drinking alcohol makes the hot flushes even worse. You kind of... It's just not worth it sometimes. You like lose a whole night's sleep.....Yeah, I need to think do I want a drink or do I want to sleep. Usually I want to sleep! [Laughs].
>
> (P5)

Women also reported putting their health and wellbeing back on the agenda after having breast cancer. Therefore, many discussed making other lifestyle changes, alongside alcohol reduction such as exercising more and eating healthier foods.

> So I think with the cancer diagnosis it just reset that, and you know when you surround yourself with people who don't drink, who do exercise, you get drawn into it, don't you....
>
> (P4)

In those who were aware of the link between breast cancer and alcohol, many felt strongly that there should be greater awareness of the link between alcohol and both the initial diagnosis as well as risk of cancer recurrence in other women.

> And we need to shout about that. Because there's too many women out there, like me, who drank perhaps just a little bit too much than we should have done, and whether that was the cause we'll never know... And that's fine...but it should be out there more....
>
> (P6)

4 | Discussion

Most of the survey sample were current drinkers, although nearly half were drinking less since diagnosis and a quarter were drinking more. The habitual aspects of alcohol consumption—automatic motivation in the COM-B model—were most strongly associated with AUDIT scores in line with the general population [26, 28]. Higher scores on reflective motivations relating to alcohol reduction and having higher AUDIT scores were most strongly associated with wanting to change alcohol consumption, also in line with the general population [29].

Habitual aspects of alcohol consumption were elaborated upon, such as it being a normal part of pre-cancer life, and that many social occasions included alcohol. Alcohol helped some to feel reduced anxiety or aided sleep in line with previous research suggesting other cancer patients may use alcohol to cope [30].

Interviewees generally reported that they cut down or stopped drinking completely during treatment because of treatment side-effects and/or an increased focus on health, which often occurs following a cancer diagnosis [31]. However, interviews also revealed conflicting emotions and challenges that may make change difficult. Alcohol consumption may also serve as a marker of a return to normality post cancer, and friends and partners may expect patients to resume patterns of drinking post diagnosis. Some participants had managed to extricate themselves from social norms of drinking but other others felt reluctant to give up a behaviour they enjoyed.

4.1 | Implications

The most important COM-B component was automatic motivation, which suggests interventions should target the habitual aspects of drinking alcohol. This may include encouraging the development of new habits, but may also include a consideration of product marketing and the media, which may cue behaviour. Social and physical opportunity were also important components. Alcohol is an embedded and often gendered social practice for mid-life adults [32]. In particular, mid-life women's alcohol consumption fulfils a role in demarking time out from caring and working responsibilities [33]. Thus, it may be useful to develop interventions that target families, couples and social groups rather than solely focus on the individual, an approach that has shown promise for physical activity interventions post breast cancer [34]. Evidence suggests that a focus on wellbeing and resilience may be a good starting point when considering health behaviour change in breast cancer patients [35].

At present, evidence about the impact of drinking post breast cancer diagnosis is still building [9] and it may be a challenge to communicate nuanced risk information to breast cancer survivors. Our findings show that survivors may use personal evidence (e.g., based on friends/family) to make health decisions, especially when they perceive that evidence is inconclusive. Future work should address this issue in order to help patients to make sense of scientific evidence. Clinicians may find it hard to discuss alcohol with breast cancer patients [36]. Clear guidance is needed to ensure health professionals feel informed and able to communicate accurate advice. Importantly, participatory approaches to intervention development are essential in order to understand the specific needs of breast cancer survivors relating to socially entrenched behaviours such as drinking alcohol [37]. Such approaches may be able to empower patients to make positive changes and have subsequent impacts on individual mental health and wellbeing [19] as well as reducing recurrence and health service costs.

4.2 | Strengths and Limitations

The study makes an important contribution in understanding alcohol consumption in breast cancer survivors. By applying the COM-B framework, the findings can contribute to intervention development. However, although efforts were made to promote the study widely, the sample was predominantly in good or very good health, White and highly educated, and only one man took part. There are widely known racial and socioeconomic disparities in breast cancer survivorship and care [38], thus further research is needed in more diverse populations. As the survey was cross-sectional we cannot make inferences about causation and recall of behaviour pre-diagnosis will be subject to memory biases. Measuring weekly unit consumption rather than the full AUDIT may be preferable in order to ascertain what proportion were drinking more than five units per week. Additionally it has been suggested that lower cut offs for designating risk should be used for women's drinking—for example scoring 0–4 on AUDIT rather than 0–7 [39]. Future research should identify the most appropriate way to measure alcohol consumption in breast cancer patients.

5 | Conclusions

Although some women reduce alcohol consumption following a breast cancer diagnosis, our sample indicated that others may be drinking at higher risk levels during and after treatment. A large percentage wanted to change their drinking behaviours, cementing the idea that a cancer diagnosis may offer a 'teachable moment' [40]. However, the normalisation of drinking may make this challenging in the longer term. Interventions should therefore allow individuals to make informed decisions following breast cancer, and target the wider context of drinking practices in order to support those who would like to reduce their alcohol intake.

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Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

References

1. WHO, "The Global Breast Cancer Initiative" (2023), https://www.who.int/initiatives/global-breast-cancer-initiative.

2. Cancer Research UK, "Breast Cancer Statistics" (2021), https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/breast-cancer.

3. D. L. Lovelace, L. R. McDaniel, and D. Golden, "Long-Term Effects of Breast Cancer Surgery, Treatment, and Survivor Care," *Journal of Midwifery & Women's Health* 64, no. 6 (2019): 713–724, https://doi.org/10.1111/jmwh.13012.

4. IARC, *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans Vol E Personal Habits and Indoor Combustions* (Geneva: World Health Organization, 2012).

5. H. Rumgay, K. Shield, H. Charvat, et al., "Global Burden of Cancer in 2020 Attributable to Alcohol Consumption: A Population-Based Study," *Lancet Oncology* 22, no. 8 (2021): 1071–1080, https://doi.org/10.1016/s1470-2045(21)00279-5.

6. S. Nechuta, W. Y. Chen, H. Cai, et al., "A Pooled Analysis of Post-Diagnosis Lifestyle Factors in Association With Late Estrogen-Receptor-Positive Breast Cancer Prognosis," *International Journal of Cancer* 138, no. 9 (2016): 2088–2097, https://doi.org/10.1002/ijc.29940.

7. C. I. Li, J. R. Daling, P. L. Porter, M. T. Tang, and K. E. Malone, "Relationship Between Potentially Modifiable Lifestyle Factors and Risk of Second Primary Contralateral Breast Cancer Among Women Diagnosed With Estrogen Receptor-Positive Invasive Breast Cancer," *Journal of Clinical Oncology* 27, no. 32 (2009): 5312–5318, https://doi.org/10.1200/jco.2009.23.1597.

8. K. Terry, D. K. Mayer, and K. Wehner, "Alcohol Consumption Discussing Potential Risks for Informed Decisions in Breast Cancer Survivors," *Clinical Journal of Oncology Nursing* 25, no. 6 (2021): 672–679, https://doi.org/10.1188/21.cjon.672-679.

9. N. Becerra-Tomás, K. Balducci, L. Abar, et al., "Postdiagnosis Dietary Factors, Supplement Use and Breast Cancer Prognosis: Global Cancer Update Programme (CUP Global) Systematic Literature Review and Meta-Analysis," *International Journal of Cancer* 152, no. 4 (2023): 616–634, https://doi.org/10.1002/ijc.34321.

10. GBD 2020 Alcohol Collaborators, "Population-Level Risks of Alcohol Consumption by Amount, Geography, Age, Sex, and Year: A Systematic Analysis for the Global Burden of Disease Study 2020," *Lancet* 400, no. 10347 (2022): 185–235, https://doi.org/10.1016/s0140-6736(22)00847-9.

11. Department of Health, *UK Chief Medical Officers' Alcohol Guidelines Review Summary of the Proposed New Guidelines* (London: Department of Health, 2016), https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/489795/summary.pdf.

12. WCRF, *Diet, Physical Activity and Breast Cancer* (London: World Cancer Research Fund, 2018).

13. NICE, *Early and Locally Advanced Breast Cancer Overview* (London: National Institute for Health and Care Excellence, 2021).

14. C. DeNysschen, J. K. Brown, M. Baker, et al., "Healthy Lifestyle Behaviors of Breast Cancer Survivors," *Clinical Nursing Research* 24, no. 5 (2014): 504–525, https://doi.org/10.1177/1054773814553298.

15. Keaver L., McGough A. M., Du M. X, et al., "Self-Reported Changes and Perceived Barriers to Healthy Eating and Physical Activity Among Global Breast Cancer Survivors: Results From an Exploratory Online Novel Survey," *Journal of the Academy of Nutrition and Dietetics* 121, no. 2 (2021): 233–241, https://doi.org/10.1016/j.jand.2020.09.031.

16. A. S. Anderson, M. Macleod, N. Mutrie, et al., "Breast Cancer Risk Reduction—Is it Feasible to Initiate a Randomised Controlled Trial of a Lifestyle Intervention Programme (ActWell) Within a National Breast Screening Programme?" *International Journal of Behavioral Nutrition and Physical Activity* 11, no. 1 (2014): 156, https://doi.org/10.1186/s12966-014-0156-2.

17. S. Michie, M. M. van Stralen, and R. West, "The Behaviour Change Wheel: A New Method for Characterising and Designing Behaviour Change Interventions," *Implementation Science* 6, no. 1 (2011): 42, https://doi.org/10.1186/1748-5908-6-42.

18. S. Michie, L. Atkins, and R. West, *The Behaviour Change Wheel: A Guide to Designing Interventions* (London: Silverback Publishing, 2014).

19. A. C. Singleton, R. Raeside, S. R. Partridge, et al., "Supporting Women's Health Outcomes After Breast Cancer Treatment Comparing a Text Message Intervention to Usual Care: The EMPOWER-SMS Randomised Clinical Trial," *Journal of Cancer Survivorship* 17, no. 6 (2023): 1533–1545, https://doi.org/10.1007/s11764-022-01209-9.

20. J. W. Creswell and V. L. Plano Clark, *Designing and Conducting Mixed Methods Research*, 3rd ed. (London: Sage, 2017).

21. E. Watson, J. Brett, J. A. Bennett, L. Matheson, and E. L. Davies, "Lifestyle Behaviours and Breast Cancer: Study Protocol," *Open Science Framework* (2022), https://osf.io/xabuj.

22. C. M. Blanchard, M. M. Denniston, F. Baker, et al., "Do Adults Change Their Lifestyle Behaviors After a Cancer Diagnosis?" *American Journal of Health Behavior* 27, no. 3 (2003): 246–256, https://doi.org/10.5993/ajhb.27.3.6.

23. T. Babor, J. C. Higgins-Biddle, J. B. Saunders, and M. G. Monteiro, *The Alcohol Use Disorders Identification Test, Guidelines for Use in Primary Care* (Geneva: World Health Organization, 2001).

24. M. Barrault-Couchouron, M. Béracochéa, M. Dorval, et al., "Tobacco and Alcohol Consumption in Women Treated for Breast Cancer in a Department of Surgical Oncology: Frequent Behaviours to Consider," *Bull Cancer* 109, no. 3 (2022): 307–317, https://doi.org/10.1016/j.bulcan.2021.07.005.

25. M. R. Benjamins, R. A. Hummer, I. W. Eberstein, and C. B. Nam, "Self-Reported Health and Adult Mortality Risk: An Analysis of Cause-Specific Mortality," *Social Science & Medicine* 59, no. 6 (2004): 1297–1306, https://doi.org/10.1016/j.socscimed.2003.01.001.

26. A. K. Stevely, P. Buykx, J. Brown, et al., "Exposure to Revised Drinking Guidelines and 'COM-B' Determinants of Behaviour Change: Descriptive Analysis of a Monthly Cross-Sectional Survey in England," *BMC Public Health* 18, no. 1 (2018): 251, https://doi.org/10.1186/s12889-018-5129-y.

27. N. K. Gale, G. Heath, E. Cameron, S. Rashid, and S. Redwood, "Using the Framework Method for the Analysis of Qualitative Data in Multi-Disciplinary Health Research," *BMC Medical Research Methodology* 13, no. 1 (2013): 117, https://doi.org/10.1186/1471-2288-13-117.

28. E. L. Davies, J. Bennett, L. Matheson, J. Brett, and E. Watson, "Shouldn't We Know This Already? UK Women's Views About Communicating the Link Between Alcohol Consumption and Risk of Breast Cancer," *Health Communication* 39, no. 9 (2023): 1–11, https://doi.org/10.1080/10410236.2023.2245208.

29. E. L. Davies, L. J. Maier, A. R. Winstock, and J. A. Ferris, "Intention to Reduce Drinking Alcohol and Preferred Sources of Support for Help: An International Cross Sectional Study," *Journal of Substance Abuse Treatment* 99 (2019): 80–87, https://doi.org/10.1016/j.jsat.2019.01.011.

30. M. Shi, C. Luo, O. K. Oduyale, X. Zong, N. K. LoConte, and Y. Cao, "Alcohol Consumption Among Adults With a Cancer Diagnosis in the All of US Research Program," *JAMA Network Open* 6, no. 8 (2023): e2328328, https://doi.org/10.1001/jamanetworkopen.2023.28328.

31. A. Di Meglio, A. S. Gbenou, E. Martin, et al., "Unhealthy Behaviors After Breast Cancer: Capitalizing on a Teachable Moment to Promote Lifestyle Improvements," *Cancer* 127, no. 15 (2021): 2774–2787, https://doi.org/10.1002/cncr.33565.

32. A. C. Lyons, C. Emslie, and K. Hunt, "Staying 'in the Zone' But Not Passing the 'Point of No Return': Embodiment, Gender and Drinking in Mid-Life," *Sociology of Health & Illness* 36, no. 2 (2014): 264–277, https://doi.org/10.1111/1467-9566.12103.

33. C. Emslie, K. Hunt, and A. Lyons, "Transformation and Time-Out: The Role of Alcohol in Identity Construction Among Scottish Women in Early Midlife," *International Journal of Drug Policy* 26, no. 5 (2015): 437–445, https://doi.org/10.1016/j.drugpo.2014.12.006.

34. K. Milton, K. Poole, A. Cross, et al., "'People Don't Get Cancer, Families Do': Co-Development of a Social Physical Activity Intervention for People Recently Affected by a Cancer Diagnosis," *European Journal of Cancer Care* 31, no. 3 (2022): e13573, https://doi.org/10.1111/ecc.13573.

35. M. Al-hamdani, and S. Smith, "Alcohol Warning Label Perceptions: Emerging Evidence for Alcohol Policy," *Canadian Public Health Association* 106, no. 6 (2015): e395–e400, https://doi.org/10.17269/cjph.106.5116.

36. P. Simapivapan, A. Hodge, and A. Boltong, "Exploring the Provision of Alcohol Advice by Clinicians to Breast Cancer Patients," *European Journal of Cancer Care* 27, no. 1 (2018): e12739, https://doi.org/10.1111/ecc.12739.

37. J. A. Thomas, E. R. Miller, and P. R. Ward, "Lifestyle Interventions Through Participatory Research: A Mixed-Methods Systematic Review of Alcohol and Other Breast Cancer Behavioural Risk Factors," *International Journal of Environmental Research and Public Health* 19, no. 2 (2022): 980, https://doi.org/10.3390/ijerph19020980.

38. S. Agarwal, J. Ying, K. M. Boucher, and J. P. Agarwal, "The Association Between Socioeconomic Factors and Breast Cancer-Specific Survival Varies by Race," *PLoS One* 12, no. 12 (2017): e0187018, https://doi.org/10.1371/journal.pone.0187018.

39. D. R. Foxcroft, L. A. Smith, H. Thomas, and S. Howcutt, "Accuracy of Alcohol Use Disorders Identification Test for Detecting Problem Drinking in 18–35 Year-Olds in England: Method Comparison Study," *Alcohol and Alcoholism* 50, no. 2 (2015): 244–250, https://doi.org/10.1093/alcalc/agu095.

40. W. Demark-Wahnefried, N. M. Aziz, J. H. Rowland, and B. M. Pinto, "Riding the Crest of the Teachable Moment: Promoting Long-Term Health After the Diagnosis of Cancer," *Journal of Clinical Oncology* 23, no. 24 (2005): 5814–5830, https://doi.org/10.1200/jco.2005.01.230.

Supporting Information

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