

Using a mobile health application to help reduce alcohol consumption: end-user perceptions of acceptability and usability and effectiveness of the Drinkaware mobile application

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Date: 4th May 2016

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1. Executive summary

This qualitative report forms one component of a wider evaluation of the Drinkaware 'Track and Calculate Units App', presenting findings from 21 telephone interviews exploring app users' perceptions of usability, acceptability and effectiveness of this offering.

The majority of interviewees were classified as current app users at the time of interview. Nine male and 12 female app users were recruited. The sample comprised a wide range of ages, from young adults to late middle-age, and included users who expressed different initial motivations for downloading the app. Framework analysis was used to analyse the data.

The key findings highlight that the app is generally easy to use and intuitive, and the *style* (tone) of feedback provided by the app was considered acceptable, as was the information provision and notifications/alerts. There was very mixed feedback in terms of the usefulness and acceptability of the specific content of feedback, with users desiring greater tailoring and personalisation to ensure that they are given feedback considered most relevant (or motivating) to them.

Details collected during the on-boarding process should more accurately capture a wider range of motivations for downloading the app, as users consistently stated that there is very rarely one single motivation for 'reducing drinking'. It is recommended that the app could be tailored to individuals based on their motivation for downloading the app.

In terms of the features of the app that users engage with, the self-monitoring (drinks recording) is the most widely used feature, and users are generally satisfied with this process. The 'no drink day' goal was the most utilised goal (also considered the most acceptable and easiest to achieve), with less clarity surrounding the 'drink one less' goal. The weak spot feature was rarely used, primarily due to a lack of understanding about its purpose and a perception that a weak spot is rarely time/physical location dependent and it should take into account other 'triggers' such as emotional states.

Overall, one can conclude that the app is a useful tool to facilitate behaviour change in users who are 'ready' to change (i.e., have a prior motivation to change) and that it does this by providing a means to record drinking and generate a greater awareness of alcohol consumption. In users who are not necessarily motivated to change their drinking behaviour initially, the app provides a useful tool to increase awareness of drinking habits and may or may not prompt subsequent reductions in drinking as a result. At present the app does little to encourage long(er) term use and prevent relapse in drinking behaviour change over time.

2. Introduction

The Drinkaware Track and Calculate Units app is a free mobile application that aims to help people who regularly drink more than the lower risk alcohol consumption guidelines to moderate their drinking. This app has been publically available to download on iOS and Android since August 2014, and was in the first 12 months downloaded by over 170,000 users. As outlined by the Drinkaware team, *'the aim of the app is to enable users to:*

- *Calculate the units and calories in their drinks and track their alcohol consumption over time*
- *Gain feedback on how their drinking may be impacting their health and help them understand whether they are drinking more or less than the previous week or month.*
- *Set goals to help them reduce their drinking suited to their lifestyle*
- *Feel supported to meet their goals through supportive notifications and 'Achievement' awards*
- *Define places or 'weak spots' where they feel they may need additional support; the app will provide a message of support when they are at these places.'*

Details on the Drinkaware App functionality and data entry process can be found in Appendix 1. This qualitative report forms the second part of a mixed-methods evaluation of the Drinkaware app. The aims of this evaluation were to determine:

1. *Who are the users of the app*
2. *Explore patterns of usage and retention over time*
3. *Explore whether user drinking behaviour changes with application use*
4. *Examine perceptions of usability, acceptability and willingness to continue using the app in the longer term.*

Results from the quantitative data analysis that forms part one of this evaluation are available in the report entitled 'Drinkaware Mobile Application Analysis, Version 5' (March 2016).

The present qualitative report focuses on the aim 4. provided in the list above – to investigate user perceptions of app usability, acceptability and intentions towards continued use. We use qualitative methods as these are considered the most appropriate for obtaining in-depth information on the views of a small number of app users, purposively sampled according to specific usage profiles and demographic characteristics.

This work intends to provide an insight into users perceptions of the current iteration of the Drinkaware app and will aid interpretation of the quantitative findings outlined in part one of this mixed-methods evaluation.

3. Methods

3.1 Participant recruitment

Ethics approval was granted from St. Mary's University, Twickenham ethics committee (dated 16 October 2015).

Existing app users who upgraded their version of the Drinkaware app after 1st Sept 2015, and any 'new' app users (who downloaded the app after September 1st 2015), were contacted directly (via email) between September and November 2015. Specifically, users who had expressed an interest in receiving further information from Drinkaware and provided their email address (n=3491) were invited to complete an anonymous feedback survey (conducted as part of Drinkaware's own in-house evaluation; see Appendix 2 for a copy of the survey).

The survey collected information on app usage patterns and user satisfaction. This survey also asked users to indicate (by providing an email address) whether they would be interested in participating in a brief follow-up telephone interview to give more detailed feedback on their experiences of using the Drinkaware app.

Over the course of a one month period 189 app users completed the survey and a total of 40 agreed to take part in follow-up interview. We sought to purposively sample 25-30 users based on their profiles according to initial survey feedback. Specifically, we utilized maximum variation sampling in an attempt to interview participants who represented a broad spectrum of Drinkaware app users (i.e. in terms of initial motivations to download the app, age, gender and current usage patterns). Participants were required to be adults between 18 and 65 years, residing in the UK and able to consent to and complete a telephone interview in English.

Selected individuals who had agreed to participate following the initial survey, were subsequently emailed a detailed information sheet and consent form. When the consent form was received, a member of the research team at Drinkaware who was experienced in conducting qualitative research then contacted respondents (at a time of their convenience), by telephone, in order to complete a 30-40 minute semi-structured interview.

The interview schedule was developed based on the prior quantitative analysis comprising part one of this evaluation, and was pilot tested within the research team before conduct of the interviews proper. The interview schedule (see Appendix 2) consists of six broad questions that were designed to obtain information on participants' experiences of using the app, perceptions of usability, acceptability, effectiveness and their willingness to continue using the app over time, along with suggestions for improvements to this product.

Consent was given in writing prior to the interview (sent via email or post) and was also audio-recorded prior to the interview taking place. Interviewees were made aware that they were free to withdraw from interviews (and withdraw disclosed information) at their discretion.

3.2 Data analyses

Interviews were audio-recorded and transcribed verbatim using the data transcription company 1st Class Secretarial Services (<http://www.1stclass.uk.com/>). We approached the data using framework analysis¹. This specific approach to qualitative data analysis was chosen as it permits key themes to be explored across the whole data set, whilst also ensuring that the views of each research participant remain connected to the other views that they express during interviews, thereby guaranteeing that the wider context surrounding a specific statement is taken into account. This is important when exploring views on app usage as the use and acceptability of various app features are likely to be tied to important contextual factors, such as initial reasons for downloading the product.

Independent researchers (KM, SA) coded the anonymized interview transcripts (50% each) and created categories or themes that linked individual codes. To ensure rigour of the coding process, 25% of the interview transcripts were double coded. Decisions on final themes and their constituent codes was an iterative process: using the first five transcripts, we created an initial analytical framework, informed in part by the structure of the interview schedule. This 'working' analytical framework was then used to index subsequent transcripts and was expanded upon as the data demanded. This led to the eventual creation of a detailed analytic framework (developed in excel) summarizing all themes to emerge across the entire data set in a coherent structure. The analysis and interpretation of themes enabled comparison of data across cases as well as within individual cases. Throughout the analysis process, KM and SA kept separate notes (analytical memos) detailing their interpretations and other potential themes that emerged.

¹ Gale et al., (2013). Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Medical Research Methodology*. 13:117

4. Results

4.1 Characteristics of the interview sample

Table one provides information on the demographic characteristics, motivations for downloading the app and baseline drinking profiles of interviewees. Twenty-one app users completed telephone interviews with the Drinkaware research team. Just under half were male (43%), and interviewees ranged in age from 25 to 64 years. 38% of the interview sample was identified as low risk drinkers and the most common motivation for downloading the app amongst this sample was 'to reduce drinking'. This was determined from self-reported data in the initial feedback survey.

Although we intended to purposively sample users so as to recruit a varied sample based on current app usage patterns, we were unable to interview more than two app users who had downloaded the app and completed the 'typical week' process but had not used the app beyond this (denoted by an ID coded starting with the letter 'A'). We were also unable to interview more than two users who had downloaded the app and used it to track their drinking but were no longer using it (denoted by an ID coded starting with the letter 'B'). Therefore the majority of interviewees represented current app users.

Five (24%) of interviewees were new app users (had downloaded app in the last two weeks), six (29%) had downloaded the app under one month ago, seven (33%) under two months ago, two (9%) under five months ago and just one user had downloaded the app more than six months ago.

Table 1: Interviewee demographic characteristics, motivations and alcohol consumption risk profile

Participant	Gender	Age Bracket (years)	Risk profile	Initial Motivation for downloading app	Length of app usage
A1	Female	25-44	Low risk	To reduce drinking	3 to 5 months
A2	Female	45-60	High risk	No information	1 to 2 weeks
B1	Male	45-60	High risk	To reduce drinking	3 to 4 weeks
B2	Female	25-44	Low risk	To be healthier	3 to 4 weeks
C1	Male	61-64	Low risk	To reduce drinking	1 to 2 months
C2	Female	45-60	High risk	To lose weight	1 to 2 months
C3	Female	25-44	High risk	To be healthier	1 to 2 weeks
C4	Female	45-60	Low risk	Just curious	3 to 4 weeks
C5	Female	25-44	Low risk	To be healthier	1 to 2 weeks
C6	Female	45-60	High risk	To reduce drinking	>6 months
C7	Female	45-60	High risk	Just curious	1 to 2 weeks
C8	Female	25-44	Low risk	To be healthier	1 to 2 months
C9	Male	25-44	Low risk	To reduce drinking	1 to 2 months
C10	Female	17-24	High risk	To reduce drinking	1 to 2 months
C11	Male	25-44	High risk	To reduce drinking	3 to 5 months
C12	Male	45-60	High risk	Just curious	1 to 2 months
C13	Male	25-44	High risk	To reduce drinking	1 to 2 weeks
C14	Female	45-60	High risk	Just curious	3 to 4 weeks
C15	Male	25-44	High risk	No information	3 to 4 weeks
C16	Male	25-44	Low risk	Just curious	1 to 2 months
C17	Male	17-24	High risk	To reduce drinking	3 to 4 weeks

4.2 Structure of qualitative themes

The themes presented below are organized largely according to the same structure as the quantitative analyses, both in order to facilitate subsequent compiling of the quantitative and qualitative data into a single mixed-methods report and to follow the probable journey that users take through Drinkaware app.

Specifically, we break down the qualitative findings into several key sections:

- (4.3) Seeking out the app and wider context of use*
- (4.4) Initial motivations for downloading the app*
- (4.5) Getting started with the app*
- (4.6) App feature usage - goal setting experiences*
- (4.7) App feature usage - 'weak spot' experience*
- (4.8) Patterns of self-monitoring alcohol consumption*
- (4.9) Perceptions of feedback, notifications and awards*
- (4.10) Usefulness and impact of the app*
- (4.11) Use of app over time*
- (4.12) Other recommendations for additional improvements*

4.3 Seeking out the app and wider context surrounding decisions to download

Seeking out the app

Interviewees could broadly be categorized as either actively seeking out a drinking app prior to download (although not necessarily the Drinkaware app specifically) or not actively searching. Those who were actively seeking a drinking app came across the Drinkaware product in a number of different ways, from searching for the Drinkaware app after seeing it advertised, to more generally searching for drinking apps and finding that the Drinkaware app was most visible (and sometimes recommended) within the app store:

“I think I saw Drinkaware on the bottom of adverts with drink sensibly and I went into Drinkaware and that’s where I found the app” (C4, female, low risk, just curious)

“To be honest, I didn’t hear about it. I googled an app store and I think put something like drinks tracker in and then that was one of the first ones that popped up.” (C17, male, high risk, to reduce drinking)

It tended to be the high risk drinkers and those who were already aware that their drinking levels were over the recommended guideline amounts who reported a more active approach towards seeking a drinking app specifically. Those with more general health concerns, a desire to know more about their drinking or who were classified as low risk drinkers tended to not be actively searching for the Drinkaware or other drinking specific apps. These interviewees tended to report coming across the app as a result of more generic searches for health related apps:

“I think as I was downloading quite a lot of other health apps, like I’ve got a Fitbit and various other things, I think it came up as a recommended app on the Google Play store” (C8, female, low risk, to be healthier)

Those who were not actively searching for the Drinkaware app (or a drinking app) either reported that they had been recommended to consult the app by a friend or family member, saw it advertised on social media (i.e. Facebook) or could simply not recall how they had come across the app in the first place.

Wider context of app use

In the majority of interviews, interviewees mentioned the wider context surrounding their decisions to download the Drinkaware app, which ranged from an interest in monitoring their health (either in general or following a specific illness) to being linked to a transitional life stage, for example, a shift from being a student to a working adult (which prompted a reflection on drinking habits), or to a change in family circumstances:

“The reason I got it was because a close family member had sort of...was a bit worried about the amount he’s drinking and it’s made me rethink like what...you know, how drinking...like how much I drink basically” (B2, female, low risk, to be healthier)

A number of interviewees also discussed how their decision to search for and download the app was made following advice to reduce drinking. This included advice supplied by their General Practitioner (GP), a personal trainer (to facilitate weight loss) or that was given as part of an obesity treatment program. In one case, the decision to download the app came as a result of seeking out help to manage drinking specifically:

“That was, instead of that being sort of in a forum about drinking, it was actually more of a forum about mental health. So, yeah, it was more on that sort of road, and then someone raised the topic of, oh, yeah, I’m teetotal now and I’m finding certain things a lot easier for me. So that’s where it came up. I wasn’t sort of seeking that out intentionally” (C9, male, low risk, to reduce drinking)

Finally, a small number of interviewees reported an ongoing alcohol dependence that underpinned their decision to download the app.

“I go through periods generally where I would get stressed or if I had issues at work where I would drink more” (C1, male, low risk, to reduce drinking)

To determine whether the Drinkaware app was the only tool that interviewees employed to monitor (and potentially reduce) their alcohol consumption, they were asked about whether they had (or were currently engaged with) any additional services or products to help manage their drinking behaviour. Responses to this question varied, often depending on users’ initial risk levels.

Only one high risk drinker discussed how the decision to download the app formed part of a wider Alcoholics Anonymous program of support. The majority of interviewees noted that they had engaged in some form of self-help – of which the app formed one aspect. This self-help ranged from use of other alcohol apps, either in the past (e.g., diary apps and NHS drinks tracker) or concurrently (one user simultaneously uses the Drinkaware app and Change4Life Drink Tracker), to a variety of other online support tools or alternative self-monitoring approaches to alcohol consumption.

“In the same way that I’m doing the food diary, I have written it down on a piece of paper before. I’m so pathetic, it sounds...I had a little like a reward chart...I set myself goals...it was almost a sticker chart, but I didn’t use the stickers because that would be sad, but...so one of my things was no alcohol, so I’d give myself a tick if I didn’t have alcohol. So it’s similar but not in an app.” (C3, female, high risk, to be healthier)

“I am quite a self-improve book reader, so I found a couple of books about positive thinking and setting yourself goals and I used those for a kind of a bit of inspiration.... I have bought a book specifically about drinking. I don’t think I would ever attend an AA meeting or I wouldn’t want to go for counselling for something like, I wouldn’t feel comfortable, whereas I find a book that can provide you that focus and information to do it yourself I find very useful” (C13, male, high risk, to reduce drinking)

Only three users specified that they were receiving no additional help or support to manage or monitor their drinking. Interestingly, two of these participants were classified as high risk users from the initial screening questionnaire, with the other participant being a low risk user.

Brand awareness prior to downloading the Drinkaware app

Approximately half of interviewees reported that they were aware of the Drinkaware brand prior to downloading the app. One interviewee reported previously using the website, while three others explicitly stated that knowledge of the brand name provided the app with a sense of credibility and so prompted their download:

“That was very much a factor in picking it. I’d heard of Drinkaware....So I was, kind of, looking for something that was like government and I found that their NHS apps are usually pretty good. And they’re not trying to sell you something. They’re just generic and very helpful which is what I’m after. And I think I saw Drinkaware and I think I suspected that it was government run and just picked that”

(C17, male, high risk, to reduce drinking)

Users who reported that they had heard of Drinkaware prior to downloading the app had seen the brand advertised on the “small print of alcohol marketing”, within supermarkets and generally “in lots of places” that included on television and bus stop adverts. The remaining 50% of users either reported not being aware of the Drinkaware brand or being unsure if they had heard of it.

4.4 Initial motivations for downloading the app

Single versus multiple motivations

Almost half of the interviewees reflected upon multiple motivations for downloading the Drinkaware app – which is interesting to note given that the app only allows users to specify one motivation at the point of on-boarding (e.g. either to reduce drinking, to lose weight, to be healthier, just curious or no information). Interviewees often discussed motivations to download the app that did not directly reflect those stated in the initial survey. Often, it appeared that interviewees who specified that they wanted to reduce drinking did so in order to achieve another goal (i.e. improve their appearance, lose weight or be healthier in general), or simply that there was no “one” motivation, but a combination that were relevant.

“It was health reasons, there wasn't really any one, just one thing, it was a series of things...it's says it's no good for your health and then if you don't have good health then it affects your appearance”

(C9, male, low risk, to reduce drinking)

To reduce drinking (single motivation)

As table one indicates, the most commonly chosen motivation among interviewees was to reduce drinking. Those opting for this motivation tended to be higher risk drinkers and were also more likely to be seeking additional support or using other tools to regulate their consumption:

“I understand my drinking, my motivation is actually to reduce it. I'm not a terrible alcoholic, I drink... I don't know, 50 units a week, something like that...I do look at the medical advice and thought, perhaps if I could regulate that a little bit it wouldn't be a bad thing.” *(B1, male, high risk, to reduce drinking)*

Curiosity

Several interviewees reported that their primary motivation to download the app was curiosity about their drinking levels and a general interest in “understanding” what their current levels of drinking were and how many units they actually consumed each week (compared to guidelines). One individual specifically reported that they wanted to “look at my relationship with drink”.

“In the summer, particularly this year, there seemed to have been a lot of publicity about alcohol, units, documentaries, every weekend supplement there was something. A lot of confusion about how much was in a unit or like a glass of wine, so I decided...that was really my motivation, to see exactly what was what.” *(C4, female, low risk, just curious)*

Mental health and well-being

Beyond the default motivation options incorporated into the app, a number of interviewees cited that one further motivation for downloading the app was to improve aspects of their mental health and well-being:

“It might be...I’m not sure if this is sort of a usual thing to download it for, but as well as sort of improving just my physical wellbeing, it was also an experiment for me, to see if it affected my mental wellbeing as well. So the whole reason I actually downloaded it, is because I thought, I wondered if certain difficulties I was experiencing at the time, were linked to excessive drinking. So it was actually more for the mental wellbeing, than the physical wellbeing. I don’t know if that’s sort of fairly common or...but that’s why I downloaded it” (C10, female, high risk, to reduce drinking)

This motivation was also discussed in the context of a more general desire to understand drinking and how this may affect mood or functioning the day after.

Recommendations

The most prominent recommendation derived from discussions on motivations to download the app relates to the structuring of the question that asks individuals about their motivation for downloading the app, completed during the on-boarding phase. Given that responses to this question are unlikely to be mutually exclusive in reality (i.e. I may wish to reduce my drinking in order to achieve several other outcomes), we suggest including an initial item that asks about motivations related to drinking, with the options to select then ‘reduce drinking’ or ‘maintain a safe level of drinking’ or ‘just curious’. This reflects the fact that not everyone wants to necessarily reduce drinking through use of the Drinkaware app.

Next, we recommend that users can be directed to fill in details about more specific motivations (e.g., to improve health, to lose weight etc). During this second step, we recommend including options that cover other potentially important motivations – especially those related to mental health and well-being, such as happiness, improved sleep and improved mood, given that these were discussed by several interviewees. This would also potentially allow for better tailoring of information and risk feedback (discussed in more detail in section 3.11). If users are able to specify that they want to reduce drinking in order to lose weight – then the majority of their notifications and feedback can relate more to weight and physical health, whereas if someone specifies that their primary motivation is to reduce drinking in order to improve sleep and mood, their feedback may be alternatively personalised and tailored based on these goals. This concept of tailoring feedback based on individual characteristics, including ‘motivation’ is supported in the literature².

One further option would be to have each motivation presented on a sliding scale so that users can select the extent to which each ‘motivation’ applies to them, or select multiple motivations and rate the degree to which each applies in their specific case.

² Noar, S.M.; Benac, C.N.; and Harris, M.S. Does tailoring matter? Meta-analytic review of tailored print health behavior change interventions. *Psychological Bulletin* 133(4):673–693, 2007.

4.5 Getting started with the app

‘Typical’ week entry process

The majority of interviewees commented on the “ease” of getting started with the app, describing the on-boarding process as “intuitive”. Although from a technical perspective the process of entering a typical week (part of the on-boarding process) was designed to be relatively straightforward, a number of interviewees commented on the usefulness and accuracy of this process:

“At first, I did sort of wonder why I was having to put in an average week. I thought, oh, would the app not sort of calculate that by itself? But I guess it’s quite a good starting point, to see...just to look at an average...your average consumption, then I suppose from then it’s got something to compare it to. But initially, I thought, this is quite a strange thing to do. And I was thinking back to my week, and thinking, oh God, I can’t remember. I was just throwing some random figures and drinks in there, that I thought were roughly accurate, but I wasn’t completely sure. But it sort of proves to be helpful in the end, I suppose” (C10, female, high risk, to reduce drinking)

The notion of there not really being a true ‘typical’ week was raised by several interviewees. For example, one commented that she was pregnant so her typical week before pregnancy did not reflect her current ‘typical’ week entered into the app.

“I think I wrote...because I’d just had a baby and I didn’t drink anything while I was pregnant, I think I wrote that my typical week was pretty much nothing, because at that point it was. But before I was pregnant it definitely wasn’t my typical week” (B2, female, low risk, to be healthier)

Other interviewees commented that the unit consumption that they reported in their typical week was likely to be an underestimate and therefore not a true reflection of drinking, although it was pointed out that this was not a reflection on the app, rather a reflection on “what you perceive of yourself”. Interestingly, one (low risk) user commented that she actually held off from initiating using the app until she felt “ready to start” – referring to prior commitments and social engagements that would have meant her drinking levels would be higher than recommended, so influencing her estimates of her typical week.

This is an interesting observation and may help to shed light on the range of on-boarding values shown within the quantitative report, especially the relatively high number of ‘0’ unit cases being reported as a typical week. This also highlights the limitations of comparing drinking at subsequently follow-up time points to baseline values (see the quantitative report), as the concept of a typical week means something very different to different users.

‘Typical’ week feedback

During the on-boarding process, users receive initial feedback from the app based on their ‘typical week’ input indicating ‘low risk’, ‘increasing risk’ or ‘higher risk’. Interviewees’ perceptions of this

feedback varied greatly, ranging from those who were not surprised, to those for whom the feedback came as a shock.

Specifically, several individuals commented that the typical week feedback was “not a shock” and they were “not surprised”, with some of these individuals noting that having feedback presented in an “objective”/ “black and white” manner just acted to reinforce their existing view of their drinking habits. These users tended to be high risk drinkers:

“I guess it kind of told me what I guess I really knew anyway; again not that that’s a criticism at all. I think the app is just useful to kind of reinforce really or recognise; you can see it in black and white so to speak.” (C11, male, high risk, to reduce drinking)

“I think initially it's not that it's a shock, but initially it's just there in front of you, like someone else saying to you are drinking too much and it's not good for you which I'm not used to that – I'm used to being in company where everyone else is drinking as well.” (C15, male, high risk, no information)

Several other interviewees commented that the initial feedback was a “shock”, “eye-opener” and “wake up call”. Feedback for these individuals came as a surprise in terms of their classification as a ‘high’ risk drinker:

“It frightened me a little bit actually...I think I knew a little bit but I never thought I was in the category of high risk, to be honest.” (C12, male, high risk, just curious)

Two interviewees reported that the initial feedback was shocking owing to the calorie equivalent of their consumption – interestingly, these individuals did not report ‘to lose weight’ as a primary motivation from the outset:

“In the typical week, that's right, and then when it tells you the equivalent of calories and how many units it is that you've consumed and the equivalent in burgers and how many minutes of running, so that was quite educational and, and, and an eye-opener....because it was something like oh my typical week, I think it was in the region of five to six thousand in calories, that was shocking in itself...So although I do go to the gym and I was thinking all that hard work is basically useless because I'm just, you know, ruining my health anyway, if that makes sense?” (C9, male, low risk, to reduce drinking)

In relation to the perceived accuracy of the initial typical week feedback, the majority of interviewees commented that this was ‘accurate’ and reflected their real drinking habits; however several interviews reflected on the fact that a ‘typical’ week of drinking did not really exist for them, hence the feedback received here is not necessarily meaningful.

The two interviewees who were no longer using app (A2 and B2) could not recall specifically how the initial typical week feedback made them feel/what they thought of it.

Impact of typical week feedback on drinking behaviour

Although a direct question probing the immediate impact of typical week feedback on drinking behaviour was not always posed, three users commented (unprompted at times) that a change to their drinking behaviour was made immediately following receipt of this feedback. This tended to be those users who were shocked or surprised by the initial feedback, either in terms of units or calories.

“I started straight away, pretty much the day I downloaded the app, and, and yes, again was quite a shock, I cut down by, I think it was a third” (C9, male, low risk, to reduce drinking)

For the majority of users, participants reported that feedback made them “think” about changing, or made them more “determined” to change their consumption levels. This is discussed in more detail in section 3.10. For high risk drinkers, self-reported changes to drinking patterns were not also immediate or prompted by initial feedback alone, suggesting more app interaction was required for these individuals:

“Probably not initially. I think it was more actually when I had used the app for some time, a few weeks, and then kind of looking at the actual reality of what I was drinking over those weeks. I think that was more of an impetus to actually change my behaviour a bit than getting that initial feedback” (C11, male, high risk, to reduce drinking)

Recommendations

Difficulties surrounding operationalisation of a ‘typical’ behaviour are not unique to alcohol consumption, and this is a contentious issue in the measurement of most health behaviours. In order to help overcome the confusion around ‘typical’ week consumption, it may be that more information is required to inform app users as to why a typical week needs to be specified within the app (e.g., in order to have something to compare future progress to etc.).

Alternatively, another option might be to simply ask participants to report their previous 7 days of consumption, which may be how users are already responding to this feature. This is likely to be more accurately recalled and is less vague than a ‘typical’ week. We recommend that further user trials be conducted to explore how users respond different ways of framing the typical week process (and the way in which it changes the units reported), in order to be able to derive a meaningful baseline on alcohol consumption within the app.

4.6 App feature usage - goal setting experiences

Themes to emerge concerning goal setting centred on interviewees' views on the individual goals available as defaults within the app (i.e. no drink day, drink within guidelines and drink one less) and more general patterns of goal setting – both in terms of multiple goals set simultaneously and usage of this app feature over time.

No Drink Day

Where set as an interviewee's primary goal, 'no drink day' was favoured for its simplicity. Interviewees tended to state that this goal fitted well into their pre-existing pattern of drinking as they were often already trying to incorporate drink-free days into their weekly consumption patterns. This goal was generally considered relatively clear to understand, easy to achieve and did not involve the effort of estimating exact quantities consumed.

"So I pledged a no-drink day, which isn't difficult for me because I don't drink every day" (C14, female, high risk, just curious)

"To an extent I was already doing it, because...I don't know why, I just was, I thought, right, okay, you can't drink on a school night, obviously" (C2, female, high risk, to lose weight)

The 'no drink day' goal was also favoured as it permitted interviewees the most flexibility to change goal parameters over time. For example, interviewees may have specified two 'no drink days' in a week (e.g. Thursday & Friday), but potentially failed to remain alcohol-free on these exact days. They may however still have achieved their goal overall by effectively substituting these days for others in the same week (e.g. Monday & Tuesday). The ease of switching days meant that interviewees felt that their goal had still been achieved, and so continued to feel motivated to reduce their drinking, despite the fact that they had not met the exact goal requirements as defined by the app. Interviewees did however note that they would like more clarification on the potential impact of patterns of abstinence on their health:

"Yes, it's the, the non-drinking days goals I think I've used most because... I didn't want to be too rigid about it - right on Monday, I'm not drinking or I'm not drinking on Thursdays, I don't know what's going to happen on Thursday... so what I've done is I've set the goals so that I'll have, say, three, four, five non-drinking days, but it doesn't matter which ones they are....." (C9, male, low risk, to reduce drinking)

"I think it's just the fact that potentially there are a couple of confusing messages in the, don't drink it all together; you can have 21 units a week but you have certain days off but if I drank a little bit every day or four days out of seven I could be drinking more; is that right." (C14, female, high risk, just curious)

This pattern of interpreting goal success based on overall number of no drink days rather than pattern of no drink days indicates that the app may benefit from incorporating functionality that allows interviewees to adapt their goals as the week progresses, or ensure that rewards for goal achievement take into account such deviations if they ultimately result in the same number of drink free days. This would allow this app feature to more accurately map interviewees' actual drinking patterns:

"It gets a little bit confused sometimes about when I've achieved my goal I think, but if I happened to have had no drinks on a day that I didn't set as a no drink day and then it kind of racks up that way, I swear it gets confused sometimes. My goal is to not drink Monday to Thursday, but say I didn't drink Sunday to Wednesday I think sometimes it goes, oh yes, congratulations, you've met your goal and I'm a bit unclear whether I have or not." (C8, low risk, to be healthier)

"Quite interestingly I set some personal goals.... but actually I'm not very good at telling you up front which days they are going to be" (C7, female, high risk, just curious)

Drink Within Guidelines

Very few interviewees reported setting this goal, with only one noting that they opted for this option only. This individual appeared to prefer setting one goal rather than simultaneously setting multiple goals as they considered clarity and simplicity important to them:

"I only set one goal because I was very keen to kind of remain focused on one thing. I didn't want to come and get lost in the app using it like a game. You know, I wanted to use it for one very specific thing.....I think I set it to drink probably within guidelines." (C13, male, high risk, to reduce drinking)

A preference for setting just one goal was echoed by a number of other users who set alternative goals. Generally, the consensus amongst interviewees was that choosing just one goal helped them to isolate a single action that they could clearly achieve, and that setting multiple goals was confusing and potentially de-motivating.

"I was trying to use all three at once and then I thought it was a bit confusing if I do that, so I'm sort of concentrating on the drink one less" (C2, female, high risk, to lose weight)

"I think I set all three of them.... I was never quite sure what I was meant to do or what was going to happen" (C5, female, low risk, to be healthier)

Drink One Less

interviewees who wanted to be more mindful of the quantities that they consumed appeared to more commonly choose the 'drink one less' goal, although this goal also appeared to have not been chosen by other users based on the reversed logic. For example, one individual stated:

"I did pledge to drink one less. I think having keyed into the app it probably is in my head, so sometimes I think, I'm going to stop now, I'm not going to drink any more" (C14, female, high risk, just curious)

For other interviewees, decisions regarding consumption appeared to be more clearly categorized into either consuming or not consuming, with degree of consumption not wanted to be considered. For these interviewees, it appeared that when a decision had been made to allow alcohol consumption on a specific day or in a specific setting, users expressed both uncertainty as to whether they would be able to recognize that they were drinking one less (as they had no standard consumption benchmark against which to compare this to), or felt that as they had made the initial decision to drink, they wished to do so without having to consider specific limits.

In individuals with this more 'black & white' approach to drinking, encouraging reductions in the amount consumed may be facilitated by including an app feature that works to strengthen users beliefs regarding their ability to self-regulate their consumption, meaning that they do not then need to engage in all-or-nothing strategies:

"I felt that I probably couldn't really pick a day when I'd drunk one less or I thought that would be really easy to do because I don't drink a set amount on a certain day. I don't like go to the pub on a certain day and think, right, I'll have three pints today so this time I'll just have two instead." (C17, male, high risk, to reduce drinking)

"I think with that I sort of...if I'm going to have a drink I probably would and if I wanted another drink I'd probably have it anyway if that makes sense". (C3, female, high risk, to be healthier)

No goals set

For interviewees who chose not to set any goal at all, reasons given included a wish to use the app for purposes other than to change their drinking (i.e. to self-monitor only), or that they pre-empted their own failure at a specific goal and so did not wish to disappoint themselves in this regard:

"No, it didn't appeal - probably because I thought if I put some goals in I'm probably not going to stick to it, which probably makes me sound a bit naughty." (C7, female, high risk, just curious)

To facilitate goal setting amongst these people, it may be useful to include goals that start off relatively easy to achieve and increase in difficulty over time in order to allow app users to gain a greater sense of self-efficacy or personal confidence through achievement of smaller sub-goals.

Incorporating automatic goal progressions may also encourage continued reductions in drinking over time and possibly prevent disengagement with the app once initial goals have been surpassed. In-built goal modification over time may prevent this feature becoming obsolete as drinking behaviour improves and may also elicit a continued sense of achievement that can continue to motivate reductions in drinking in the long term.

Interestingly, it appeared that some users were already engaging with the app in this manner, and appeared to be adapting their goals over time. To include such progressions as a default may help encourage users who are not necessarily as self-motivated, but would otherwise be willing to adapt their drinking behaviour over time.

"For me having some kind of goal I'm quite strict with myself if I've got something to aim for that I want to achieve it." (C8, female, low risk, to be healthier)

"So the first few weeks this is what I was doing, but then it kind of became obsolete, because I was sort of, only having like one drink a week, so the goals kind of became obsolete for me." (C9, male, low risk, to reduce drinking)

"Yeah, it's good to set yourself a challenge and to sort of, over the course of using it, I've sort of gradually increased the number. So it becomes like an extra benchmark each...however many weeks." (C10, female, high risk, to reduce drinking)

Goal Achievement

In general, it appeared that interviewees who utilized the goal setting feature did feel that these goals had helped them make changes in their consumption habits, and while goals may not have been met consistently, they seem to have been achieved at least part of the time.

Incorporating feedback based on patterns of goal achievement over time, rather than limiting feedback to achievements in the present week only may also help to provide continued encouragement or extrinsic motivation (i.e. through external rewards) to users who may not yet be able to consistently achieve their goals:

"...so I'm definitely achieving in the main my no drink days if not massively exceeding it, so I'm sometimes now going seven days without, you know, having a drink from having no drinks for a whole week and I'm definitely drinking less when I do." (C8, female, low risk, to be healthier)

"I didn't manage it on the first week but I did drink less I noticed" (C13, male, high risk, to reduce drinking)

"I guess actually that I wasn't so successful. I was having the days where I didn't drink at all so I kind of played around with it actually only a couple of days ago and so I've entered some new targets on that front so I'll see how that goes." (C11, male, high risk, to reduce drinking)

Feedback on goal achievement is generally received positively by users engaging with this app feature:

"...so you kind of get the well done thing whenever you do, because it really does spur you on to have a look at what you're going to do the rest of the week, so to speak." (C2, female, high risk, to lose weight)

Recommendations

Recommendations supplied by interviewees include incorporating a wider range of possible goals that map more closely onto initial motivations for downloading the app. For example, if 'to lose weight' was stated as a motivation during on-boarding, including a goal that relates to this motivation may act as a more appropriate incentive to reduce drinking.

Other recommendations include adaptivity in goals, as noted above, and for the Drinkaware app to send users push notifications when they may be close to failing a specific goal (i.e. for drink one less, if they are nearing their drinking target), although this does rely on users recording their consumption in real time (see section 3.8 for more details on self-monitoring patterns).

"...one of the other reasons that I decided to download it is that I can...I've got...I've suffered from depression in the past and I know that drinking really affects depression. So if there's...you know, if there was something that was linked a bit more to emotional health or you know, mental wellbeing, as one of the goals, that could be something that I would be...I would probably have set myself." (B2,

female, high risk, no information)

"...so sometimes, I suppose it [the no drink day goal] might be it looks a bit rigid, in that sense." (C10,

female, high risk, to reduce drinking)

"..to the best of my knowledge you didn't actually get a push notification to say that you're near or at the target that you set, so actually it was quite easy to go beyond that target so that's probably why I haven't been so successful because you'd actually have to keep a kind of mental tally." (C11, male, high risk,

to reduce drinking)

"I was just thinking say you were tracking your drinks as you go whether it could give you some kind of I don't know warning, like only so many more units and you'll be whatever." (C8, female, low risk, to be

healthier)

4.7 App feature usage - 'weak spot' experience

Patterns of weak spot usage

Few interviewees in general appeared to engage with the 'weak spot' geo-location feature incorporated into the Drinkaware app. The primary reasons given for not using this feature were misunderstanding its purpose, a belief that it was not relevant to the particular users' drinking patterns and that drinking 'weak spots' did not exist in the sense of a place, but were better conceptualized as either social situations or that drinking was triggered by an emotional state or formed part of a habitual behavioural pattern.

Regarding the first of these reasons, that the feature did not appear to be well understood, interviewees tended to cite that they did not initially recognize the purpose of this app feature and were not sufficiently motivated to explore it in further depth in order to understand of how it functions. It might therefore be concluded that features included in the Drinkaware app need to be readily understandable in order for users to fully engage with them. Related to this is the fact that a number of interviewees appeared to have not even noticed that this feature was even available:

"I'm a bit of a skim reader, so if it doesn't make sense immediately and I'm not that interested in it I'll just skip past it. So I wasn't...I kind of...I probably...if I...maybe it wasn't as quickly understandable as I needed it to be." (B2, female, high risk, no information)

In terms of this app feature lacking relevance to users' drinking patterns, it emerged that interviewees either tended not to associate one specific location with drinking, or if they did associate a certain location with drinking, this location was also associated with many other activities (e.g. home), and so lacked meaning or identity as a drinking 'weak spot' specifically.

"So I didn't use that because it's not that I go out. Obviously given my age in that I'm in my late 50s I don't go out clubbing or anything so it's not as if I need a little text reminder to ping in saying, you're at the club, watch what you're drinking." (C14, female, high risk, just curious)

"It doesn't really work for me...There's not really any one place where I would go to consume alcohol." (C8, female, low risk, to be healthier)

The third reason given for not using the weak spot feature was that interviewees more commonly felt that they were triggered to drink at events or social gatherings, by an emotion or through feelings of stress, or that they felt that their 'weak spot' was more likely to be a 'weak day', such as a Friday or during the weekend, when social drinking is a cultural norm:

"...Well, no, I can't see the point of that, I mean, what is the weak spot... I think the weak spot is more not a physical place is it, the weak spot is because you suddenly think, oh god, I'll go and have a drink.....Yes, it's about your general circumstances are much more accurate, or much more relevant."

(B1, male, high risk, to reduce drinking)

“I did look at and thought actually it doesn’t work like that for me because I would say I’m a social drinker but I tend to drink when I’m with my friends at their houses, so it talks about current locations so I couldn’t put, you know, your current location, address or postcode – so I probably a day of the week would be more useful for me”. (C14, female, high risk, just curious)

“I put in my home address because that, I think, is probably the weak spot because depending on how I feel, I guess, at the end of the working week, and there’s a lot of changes happening at the college of further education that I work at, we’ve had a lot of redundancies. I’m not using this as an excuse, but stress is quite high at work, so yeah” (C2, female, high risk, to lose weight)

In the cases where weak spots were set, this appeared to be mostly ‘home’. Interestingly, in many of these cases, even if a specific location was set up as a weak spot, interviewees did not commonly receive weak spot alerts, possibly because they had disabled this feature on their phone:

“I guess my weak spot is coming home. If I was really fed up with how the week has gone, then that would be what I would do, I’d stop at the supermarket on the way home for my bottle of wine and so my home is my weak spot.” (C2, female, high risk, to lose weight)

“It’s more that I’m just conscious that I’ll have a glass of wine whilst I’m cooking dinner and a glass of wine with dinner and then I’ll have a glass of wine later. So I’m very aware that my weak spot is in the house”. (C6, female, high risk, to reduce drinking)

“Yes. I did. I set up a few. I’m just wondering if it was meant to give me a notification, but I don’t recall ever getting one.” (C10, female, high risk, to reduce drinking)

In the two cases where this application feature is used and alerts are received, interviewees mentioned appreciating the capacity for this feature to help them break habitual associations between drinking and a specific location or pattern of behaviour conducted in a location. It would therefore seem that individuals who engage with this feature may be those who have some understanding of the mechanisms through which it intends to work (i.e. breaking cue-dependent associations between a behavior and a stimuli based on habit formation theory³), and so understand its potential utility from the outset.

“As you go past them it reminds you that you know, not to have a drink. Yeah I think it’s useful.” (C1, male, low risk, to reduce drinking)

“...oh, yes, actually, it is my weak spot and you start to be, it just makes you think differently about your triggers as well.” (C9, male, low risk, to reduce drinking)

³ Gardner et al., (2012). Making health habitual: the psychology of ‘habit-formation’ and general practice. Br J Gen Pract. 2012 Dec; 62(605): 664–666.

Recommendations

Given the apparent lack of clarity surrounding this app feature, it may be beneficial to provide users with a brief description of how this feature functions or to provide some additional information outlining the proposed mechanisms through which it is likely to work.

Moreover, re-designing the feature to take into account 'weak spots' that are not physical locations, but rather situational or emotional triggers to drinking, may increase the relevance and effectiveness of 'weak spot' notifications. Ways to do this may be to include a feature that incorporates ecological momentary assessment (e.g. asking research participants repeatedly reports on symptoms, affect, behaviour, and cognitions close in time to experience and in the participants' natural environment) potentially prompted by app notifications⁴ to obtain information on users' emotional patterns or triggers to stress over a period of time, and then to introduce a weak spot notification system based on the information gathered, if app functionality allows.

⁴ Moskowitz et al., (2006). Ecological momentary assessment: what it is and why it is a method of the future in clinical psychopharmacology. *J Psychiatry Neurosci*. 2006 Jan; 31(1): 13–20.

4.8 Patterns of self-monitoring

General patterns of recording drinks

The majority of interviewees reported *daily* self-monitoring of alcohol consumption, a finding that was generally supported by the results of the quantitative analysis (i.e., those individuals using the app tend to record drinks for most days of the week, opposed to just one or two sporadic days):

“I tried to use it every day” (A2, female, high risk, no information)

“I’d use it in the evening after...like bedtime sort of time”. (B2, female, low risk, to be healthier)

“I do it daily most of the time. If I haven’t done it for a few days then I will go back and add it in retrospectively. I’m not in a particular routine with it I would say. I don’t know 80 per cent of the time I do it daily but then I might forget for a few days and just go back and do it”. (C8 female, low risk, to be healthier)

For most respondents, daily recording of drinks was done in the evening, with some respondents leaving it until the following morning. A number of interviewees reported a “routine” surrounding app use in general, in which the usage of the Drinkaware app became incorporated:

“Because, I’ve got a couple of other little apps that I look at on a daily, not all apps, but a little regime of four or five, you know, I check the weather and I look at my drink app, and various things like that, a little routine, so pretty much daily” (B1, male, high risk, to reduce dancing)

The notion that recording patterns varied depending on the drinking environment was raised by a couple of interviewees. Specifically, if individuals reported drinking at home, then they were more inclined to record their consumption drink by drink (in a small number of cases) or record all drinks later that same evening (in most cases). However, if they were drinking a public place (i.e., a bar or pub), then they were more likely to record drinks retrospectively:

“When I say every day, I tend to fill them in the next day. If I’m out having a drink in the pub, I don’t sit there and each time put it into the app...Either when I come home, depending on the time like. If it was after say, midnight, then you’d have to go back a day so I would leave it ‘til the following morning” (C12, male, high risk, just curious)

Retrospective recording of drinks created a number of challenges for interviewees in terms of accurately “fill in the blanks”, so affecting the accuracy of information entered into the app, especially on “heavier nights”:

“But often on the heavier nights, I have to guess because I don’t always do it when I’m out. So when I go to the pub or sometimes when I’m not having very many, I can easily remember so I’ll either do it

at the time or after. But to be honest, when I've had more, I'm guessing roughly at how much I've had". (C17, male, high risk, to reduce drinking)

Interestingly, one interviewee reported voluntarily “over-estimating” drinks when retrospectively recording consumption, due to their wish to report their drinking as accurately as possible, under-estimating was seen as worse than over-estimating:

“Yeah, I do like it to be accurate but I think that’s just my personality. But when I didn’t really know how much on the nights where I didn’t do it as I was drinking, I would probably tend to take a pessimistic outlook and probably put a bit more than I thought that I’d drunk, just to make sure I wasn’t underestimating it”. (C17, male, high risk, to reduce drinking)

Real time data entry

Only three interviewees reported that they regularly record their drinks in real time – but even these individuals reported that on rare occasions they waited until the end of the day. Two of these interviewees were high risk drinkers and one was classified as a low risk drinker.

“I can’t say 100 per cent I always enter it at the time but literally because I almost always have my phone with me I usually enter it at the point of buying a drink, so kind of drink-by-drink; very occasionally if my phone dies or whatever then I might enter it the next morning.” (C11, male, high risk, to reduce drinking)

Interestingly, one respondent reported that he had changed from recording drinks at the end of the day to real time recording, highlighting that he considered this to be more beneficial as it made him more aware of what he was consuming:

“What I tended to do originally was kind of fill it in the day after and then what I actually started doing was filling it in as I was drinking in an evening and I found that again, also actually very beneficial. Actually that is one thing that maybe could be improved. It is almost like a reminder pinging up as an evening based pop in, reminding you to track your drink....every time you have a drink and logging into the app and adding that, you know, it stops you from, you know, just chucking down drink after drink. You actually have to think about what you are doing and it makes that decision more considered....I think I maybe did it one night unintentionally and then actually I realised, well actually this has quite an official effect”. (C13, male, high risk, to reduce drinking)

Continued self-monitoring

Four interviewees commented that their self-monitoring habits had “tailed off” after continued use of the app. These interviewees had all been using the app for 3-4 weeks at the point of interview.

“I'd probably say every other day, every two or three days maybe.....I've been a bit lazy with it. I think, you know, like with a lot of apps and new toys really, you know, you are kind of eager to begin with and then it's tailed off”. (C15, male, high risk, no information)

One interviewee commented that their drinks recording had tailed off due to the fact that he wasn't seeing any changes in drinking behaviour, which left the app self-monitoring process feeling like “a bit of an effort”. Another interviewees commented that they turned off the notifications after a few weeks (“I sort of got a bit sick of that”) and then noticed that she was not recording drinks as often as she previously had done.

Usefulness of self-monitoring (as a behaviour change technique)

This feature of the Drinkaware app was reported by interviewees to be used more consistently than both the goal and weak spot setting features (as is evidenced in the quantitative report). For a number of interviewees, the self-monitoring component was the only app feature that was used – interestingly, for these three individuals, their original motivations for downloading the app was ‘curiosity’, rather than aiming to reduce drinking specifically.

There is consistent evidence within the behaviour change literature that “self-monitoring of behaviour” is an effective behaviour change technique, and that prompt self-monitoring has been associated with better outcomes for a wide range of health behaviours⁵, including alcohol consumption⁶. A small number of respondents commented that the act of self-monitoring drinks alone “slows it [drinking] down”. One interviewee also commented that the process of recording all drinks made her feel “guilty” if she had drunk too much (this individual later commented that she does perceive her drinking to have reduced over time).

Another user commented that the act of recording drinks provides a sense of “accountability” which ultimately leads to a reduction in consumption:

“And I think the...I think writing things down or having a visual picture gives you accountability, so it sometimes like makes you...say for example now, I want to eat a bar of chocolate, if I have to write it down I think well I won't eat the bar of chocolate. And I think that's a bit the same with the...whereas I might have just had a glass of wine, the feedback from having a, no drink day, and having that on the chart, counteracts it, if that makes sense. So I'm less likely for example, just to have a glass of wine, because I'd rather have the, no drink day”. (C3, female, high risk, to be healthier)

⁵ Michie et al. (2009). Effective techniques in healthy eating and physical activity interventions: a meta-regression. *Health Psychol.* 28(6):690-701. doi: 10.1037/a0016136.

⁶ Michie et al. (2012). Identification of behaviour change techniques to reduce excessive alcohol consumption. *Addiction.* 107(8):1431-40. doi: 10.1111/j.1360-0443.2012.03845.x. Epub 2012 Apr 17.

One user (female, high risk) commented that the process of recording drinks was still useful, even when drinking had reduced to zero units:

“And I think.....even when I stopped all together, there was something still really...something to be said for still logging that, even though I was looking at a whole month and it would just be all green, and it would be like nothing, nothing, nothing, nothing, it was still quite satisfying to log that somewhere, if that makes sense. So, at the end of the day, you go, yeah, I’ve done it again. I’ve done another night, where I haven’t...I’ve met the goals that I wanted to meet. And then you’ve got somewhere to actually log that and you’ve got something that shows you the progress that you’ve made. And so that’s really, really helpful, and it’s sort of a little motivator for yourself (C10, female, high risk, to reduce drinking)

This is interesting given that a consistent theme to emerge across interviews was a feeling that the app offers little utility as a ‘maintenance’ tool once drinking has been reduced (see section 3.11 for more details on patterns of long term use). Whether this concept is different for app users depending on initial drinking levels and motivation to use the app is worthy of further exploration. For example, for individuals who are alcohol dependent – the concept of continued monitoring of consumption (including zero consumption) is documented in the alcoholic support literature as one technique that can contribute to relapse prevention⁷

Process of recording drinks

Several interviewees reported that the process of recording drinks was “easy” overall, with comments concerning the ease of adding custom drinks/adding own drinks, as well as the ease of selecting drinks from the pre-specified list:

“....so you are switching on your phone, swiping up, tap the app, add a drink, you know, five or six clicks something like that. I am not having to type anything out. I am not having to enter any words. You know, it is literally just one push, one tap sorry and you are done” (C13, male, high risk, to reduce drinking)

“I find it’s easy, well I find it’s very easy and if, for example, you know, if you can’t find a specific drink, okay, then, you know, be it just the fact that you can actually make up your own, you know, by choosing whether it’s white wine, red wine, whether it’s rose and the strength and the thing, you know, the size of the glass and the price of it, it’s all, you can actually set up manual quite easily anyway” (C9, male, high risk, to reduce drinking)

⁷Klingemann. (1992) Coping and maintenance strategies of spontaneous remitters from problem use of alcohol and heroin in Switzerland. J Addict. 1992 Dec;27(12):1359-88.

Another subset of interviewees commented that the process of recording drinks was too complicated, with one comparing the Drinkaware app to a weight watchers app in which you could type in the brand name of a product and it would come up with all the different options (rather than manually searching through the list). Other users commented that the Drinkaware app was not particularly user-friendly for recording drinks or for saving “favourites”:

“It’s a fuff having to go and find, like the brand and then resave things, you know, for all the different levels, so say 12 per cent wine, a 125ml glass, find that and then if you don’t...if you think oh I have had a 175, you’ve got to go and find that, I think that’s a bit of a fuff”. (C4, female, low risk, just curious)

Drinks Database

A number of interviewees commented that the list of drinks to choose from within the app was sufficient and captured their usual drinking patterns:

“It was quite easy because it had all the different kinds of drinks that I would have. Yes, it seems fine, easy to use”. (C8, female, low risk, to be healthier)

Others, however, commented to the opposite effect - that the list of pre-specified drinks did not capture the variation in ABV required to report accurately:

“That is the bit I don’t like quite so much, because it’s interesting the drinks that you have listed on there and the ones that aren’t on there. In some ways I’d quite like it if it was almost like you had more, kind of, beer, different make, number of percent proof and that was it. Sometimes it is quite hard to find the one that you want to put on”. (C16, male, low risk, just curious)

In contrast, one interviewees reported that the very long list of various drinks was off-putting- especially as she had to manually set up custom drinks regardless of the list available:

“I found it a bit difficult to get around selecting the type of drink that I’d taken, because some of the more exotic beers that you can get in the shops are not necessarily on the list and you have to, sort of, chose other and then the alcoholic percentage, but there’s also a list on there that I don’t drink and it would be nice if you could just, sort of, enter the names of the drink that you actually do drink and then maybe select what you’re taking from your own customised list....I think that was one of the reasons I stopped using it, because there were so many...a big list of drinks that I don’t drink and my own drink I was having to enter as other and that put me off a little bit”. (A2, female, high risk, no information)

Customised drinks

It is interesting to note that whilst several interviewees commented on the ease of “personalizing” the drinks list to suit them (i.e., adding custom drinks with accurate sizes and ABV’s), others’ comments suggested that they did not know that this was an option:

“It sometimes can be a bit of a faff to download the drinks and also you don’t always fit into having a 175 or a 250, so I think that there would be a benefit in being able to actually put your own measure in”. (C6, female, high risk, to reduce drinking)

This was reflected further by the fact that there appeared to be a contrast between interviewees who were satisfied with estimating drinks/ABV and size and those who wanted the process of recording drinks to be as accurate as possible. For example, several interviewees commented that they “made it up”, using drinks that were “close enough” to what they had consumed, while others commented that complete accuracy of reporting was of central importance:

“Sometimes I make it up, so let’s say I have a glass of Champagne, I don’t necessarily know what percentage proof it is so I just guess because I think it’s probably good enough, and that would apply to wine as well. I wouldn’t go to the bottle that my friend’s pouring me and have a look and see what percent it is; I would just measure whether I’m having 125 or 175, which is equally quite difficult when you’re at someone’s house rather than buying measures in a pub” (C14, female, high risk, just curious)

“...because it’s sort of very generic, so you know, I can’t think of an exact example but like a pint of beer or a pint of lager, 4.5% is your only option. Whereas, I found myself getting a bit frustrated because it didn’t have all of the options and even with the kind of...the additional ones, it didn’t quite cover things that I was drinking”. (C5, female, low risk, to be healthier)

Recommendations

It remains difficult to make recommendations relating to the process of recording drinks within the app, given the variation in responses regarding the ease of inputting drinks and the ability to customize drinks that are added. This is probably reflective of interviewee’s prior app experience and also of personal traits, such as a desire for greater accuracy at the possible expense of ease of use. It would be worth exploring further how users interact with the app (perhaps further user-testing) to see how people navigate the app to record drinks. A “think-aloud” protocol can be particularly insightful here, in which users can verbalise their thought process as they navigate the app. This approach may allow for more detailed recommendations for technical refinements that can improve this feature of the app. Alternatively, A-B testing protocols may be useful to improve this feature further. This involves either (a) establishing a ‘baseline’ for a key set of variables and then making a change to the app and determining what effect this has, or (b) giving different versions of the app to different groups of users and establishing what difference this makes.

One recommendation that does not involve further evaluation may be to add further brands and glass sizes – especially very small amounts (i.e., “just a sip”!) to ensure that a range of options are captured by default within the app. Provision of clearer instructions on customizing drinks lists may

also be helpful, especially given that some interviewees did not seem to be aware that this was an option.

Given the usefulness of recording drinks in 'real-time' as opposed to at the end of the day or the following day, we recommend more reminders/notifications to highlight the benefit of this approach, although this is with the added caveats that this is may not always be possible, depending on drinking environment. Furthermore, there is likely to be an optimal number of alerts that users remain responsive too, beyond which point, they may be deterred from using the app.

Also, from a data capture/analytical perspective – it would be useful to record the timing of drinks entry (i.e., varied throughout the day/evening versus all in one go at end of evening/next day) rather than rely on user self-reports of their pattern of self-monitoring. This would prove useful if subsequent evaluations wish to further explore how reporting patterns may be associated with behaviour change.

Finally, as the quantitative report highlights, there are a number of limitations of using self-reported drinking data as an outcome in the quantitative analysis, especially as this form of recording is also a key 'behaviour change technique'. This notion was further supported in the qualitative interviews, with interviewees noting that the process of recording drinks is itself seen a useful mechanism to facilitate behaviour change. We recommend that future iterations of the app incorporate a separate drinking questionnaire at baseline (and other stages throughout the app, i.e., 4 weeks, 8 weeks etc), especially when trying to quantitatively analyse associations between app use and drinking outcomes.

4.9 Feedback, notifications and awards

Usefulness of feedback provided by the app (general)

Several interviewees commented on the usefulness of feedback (in general) provided by the app. Specifically, a couple commented that the feedback provided in the app helped them to “quantify” their drinking habits – which was particularly useful for encouraging subsequent behaviour change. One interviewee commented that the “stats” enabled him to compete with himself each week to try and improve his feedback. A re-occurring theme across several interviews was the importance of the “numbers”:

“I like the numbers. I like to track stuff and have some figures behind it rather than just like, oh, I’ll go for a run today. I’ll be like, well, I’ll go for a run today but what’s my time from last time and how can I beat it? And I think that’s why this kind of app appeals to me. If I just put the drinks in and it just said you’re drinking too much but didn’t give any numbers behind it, I’d probably delete it within a few days”. (C17, male, high risk, to reduce drinking)

One interviewee commented that the feedback provided on drinking makes the app less “passive” than a previous diary app that had been used, while another commented that it was the combination of self-monitoring (recording drinks) and receiving feedback about drinking that is beneficial:

“I guess because you were filling out a diary it’s a bit more passive and the fact is that when you enter your figures on the drinkaware app that first notification and ongoing notifications made you more aware of what you were doing and you are more inclined to do something about it”. (C13, male, high risk, to reduce drinking)

“...the fact that I’m going in on a daily basis and putting in the information, and whatever way I was using it, it was giving me back some feedback. It was easy to put the information in....and it’s giving me statistical information back based on what I’ve been doing since I started using it. (C12, male, high risk, just curious)

Feedback on calories

Within the app, users are provided with several forms of feedback, one of which presents the calories consumed that week in alcohol, along with a real food item equivalent (e.g. ‘burgers’). A couple of interviewees commented that this was the most “surprising” aspect of the feedback provided by the app:

“The most surprising thing actually was the amount of calories. Because I know there’s lots of calories in alcohol but I never linked drinking a lot to having a lot to eat. And then when it said you’ve had 2,500 calories in alcohol this week or some ludicrous figure, I thought, whoa, that’s a lot.

Looking at it and saying you were two times or three times over the recommended [units] I thought, well, that's probably what I would have guessed. But the calories was something I hadn't expected, so I think when I've looked back on it, that's probably been quite useful to see....Because when you think about how much you eat and what's a lot... You know, if you think about having a massive pizza that might be a 1,000 calories, I'd think twice about eating a really big pizza. But having ten pints in any night, I would link it to be unhealthy and costly and feeling a bit bad the next day, but I wouldn't have thought before that it was also calorific. (C17, male, high risk, to reduce drinking)

Interviewees varied greatly in their perceptions of how useful this type of feedback was. For example, some commented that the calorie feedback is more motivating and informative than general feedback on drinking (units):

"It's more realistic, it's more fun, that's right, rather than, you know so this is how many, this is how many units you've drunk, because that means absolutely nothing to me". (C9, male, low risk, to reduce drinking)

However, an equal number of interviewees commented that the calorie feedback was not specific or personal enough to be useful:

"...it just feels a bit too generic. Whereas with the MyFitnessPal it's very much, you know, one can of Carling you know you're going to consume, you know, 210 calories and that's it for Carling. If you drink Carlsberg it could be 220 or, you know". (C5, female, low risk, to be healthier)

Regarding feedback in the form of eating burgers, again opinions varied greatly, with some interviewees finding this more useful and meaningful than calories, whereas other reported that this was just not relevant to them:

"So like for example my alcohol calories this week are 444; from this time last week is minus 1448 because we were on holiday, but on its own that information, I know that I've drunk less but it doesn't really mean a lot to me, so the equivalent of 1.5 burgers is much more realistic". (C14, female, high risk, just curious)

"I don't see the relevance of the burger. Comparing the calories in the burger, I don't see that relevant at all, to be honest with you. I think that makes it more like a bit of a joking app....I mean, having 11 burgers. I think...if you were then putting in say, a male or female, certain age and weight. Then you might get it set up that your calories for this week is X number, but because of your drinking so far this week, that has been your calories. So it might be a case of... You could even put in something like, 75 per cent of your weekly calories is drink." (C12, male, high risk, just curious)

"I don't even eat burgers, I'm a vegetarian." (B1, male, high risk, to reduce drinking)

The app also tells the user how many hours running would be required to burn off the calories consumed in alcohol. Interestingly, no interviewees commented on this form of feedback, apart from one male interviewee who suggested that ‘walking’ equivalent should be provided, given that he does not run, making the feedback less meaningful.

Feedback on cost

Similar variability in interviewee responses was revealed when they were asked about the feedback that the app provides on amount of money spent on alcohol. Again, some interviewees reported liking this feedback and finding it motivating – although none said that they found it the ‘most’ motivating form of feedback (compared to unit or calorie feedback). At the other end of the spectrum, several interviewees commented that this feedback was not relevant for them.

“I think putting things in terms of money. So when it works out how much you’ve saved. I think that means a lot to people and that could really hit home as well, so that’s really interesting, to actually go, bloody hell, that’s what I’ve spent a week on that.” (C9, male, low risk, to reduce drinking)

“...but the cost not so much so. I have never, you, you know, I don’t drink enough.... but it is nice to see”. (C13, male, high risk, to reduce drinking)

“The cost for me personally isn’t so much of a driver; it’s much more just about bringing down the level of drinking and about my health as opposed to what I’m spending”. (C11, male, high risk, to reduce drinking)

Although one interviewee did comment that the cost feedback “actually matches” what he spends on alcohol, and so is a useful tool to help manage his budget, a small number of interviewees suggested that the cost feedback is not accurate given that the cost of drinks depends on drinking location. A couple of other interviewees commented that there was also no option to state that the drink was ‘free’ (i.e., being bought by someone else or drinking at a friend’s house).

“...cost can vary so much, I realise it has to be fairly generic, but you know, people in London, a beer, you know, a pint of beer can cost you a fiver in a pub, whereas where I’m from up in Grimsby, you can still get a pint for two quid”. (C5, female, low risk, just curious)

“It’s not frustration, but the monetary value isn’t necessarily a true representation of how much I’ve spent, so because I tend to sort of go for offers, so it doesn’t always equate, and actually the pub that we use that’s near college is a Wetherspoons, so they’re very much cheaper. I don’t know if you know the chain, but they don’t charge anywhere near as much as independent pubs, so that in itself is not necessarily a true representation” (C2, female, high risk, to lose weight)

Feedback on risk level

Several interviewees commented that the weekly feedback on risk level was potentially too vague to be considered useful. One user commented that the ‘risk’ level didn’t really have an effect given that it was quite non-specified:

“...it's just like, you know, it meant nothing.....be in high risk, it's just, it's just a combination of words....You see, when you're telling me you're high risk because you're going to go blind, that's a different story...If you were telling, so if again, those things, you know, high risk, low risk, whatever that is, medium or, what's the, there is a red, orange and a green, anyway, so yes, they mean nothing” .(C9, male, low risk, to reduce drinking)

Other interviewees also commented that the feedback relating to risk level is not sensitive enough to capture changes in drinking – which can leave them feeling de-motivated if they had reduced their drinking (in terms of units consumed), but still received the same, generic feedback of risk-level:

“It just feels quite generic. So, like with the feedback things, you know, with the three options, it's a bit blah, it's kind of your doctor saying, oh, you drink too much....I think with things like that, when there's only sort of three finite options...it kind of gets a bit dull after a while.....it didn't really help me change my behaviour. I just thought oh, I'm still yellow” (C5, female, low risk, just curious)

“Because I was increasing risk and drinking, you know, quite...I'm not saying I was an alcoholic or anything like that but I was drinking a lot more than I know that, you know, would be perceived as healthy. So like a couple of glasses most nights...and then coming right down to a bit at the weekend and not a lot more than that. So, I felt really virtuous actually. But, it was still saying I was at increasing risk. And I get that, because I guess what I was having at the weekends was still more, but I just feel like if there's that big threshold...I kind of felt like I wanted the reinforcement of, oh you're doing really well, your risk has come down....I completely appreciate that that group must be massive, but I felt like I didn't really progress even though I was doing really, really well. (C3, female, high risk, to be healthier)

Feedback over longer term

One interviewee commented that the monthly feedback display (at the moment this presents a 28-day overview comprising circles that represent risk levels on each day) was very clear and enabled him to see an overview of the previous months drinking levels:

“I mean it is very clear. It's very...especially on the monthly one because it has got the different colours so straightaway you know whether you are okay, not that okay, and very bad kind of thing. It is very straightforward really, which I like.” (C16, male, low risk, just curious)

However, several interviewees commented that they would like specific unit feedback over a longer time frame. Specifically, users commented that they would like the app to display some sort of graph (or visual display) showing actual units over time. This relates to the point highlighted above about the risk feedback being too generic to show progress/subtle changes in drinking. This is discussed further in section 3.11:

“It sort of comes up as like little circles instead, like coloured circles, to show you where you were on each day of that month. And maybe a graph of the whole 28 days, might be a really good overview.....so you can see if it’s gone down, if it’s gone up across the month, where maybe at what point in the month it goes up and down, and then, yeah, that might be quite helpful”. (C10, female, high risk, to reduce drinking)

“So I’ve been doing it for 12 weeks; I’ve had seven weeks of lower risk and five weeks of increasing risk but without going into each one of those weeks I don’t know how many units I’ve had, because it looks to me that a typical week I could be an increasing risk anything between 19 and 30 units, or maybe less; I don’t know because I don’t know what the parameters actually are”. (C14, female, high risk, just curious)

Style of feedback

Several interviewees (of differing initial risk levels) commented that the style of feedback provided by the app (in general) was acceptable. Interviewees described the style of communication as “inoffensive”, “sensitive” and “appropriate”.

“I think the tone’s absolutely right, I do, and it’s encouraging when you achieve things, and it’s not discouraging when you haven’t, it’s just come on, try again, sort of thing” (C2, female, high risk, to lose weight)

“Yes, I mean...it’s appropriate in terms of timing, it’s not too intrusive, it’s not telling you off too much either, it’s just, kind of, you know, hey.” (C8, female, low risk, to be healthier)

Only one interviewee (no longer using the app) commented that he found the style of feedback quite patronizing – especially relating to the awards:

“To be frank, I don’t think it’s a bad feature.... but I don’t know that I need that to tell me that I’ve been a good boy, you know what I mean, I kind of know that myself”. (B1, male, high risk, to reduce drinking)

Similarly, only one interviewee commented that they perceived the app to be “telling me off” which was disheartening:

“I don’t know, it’s, to be honest, it’s probably the only thing is, you know, it’s that it’s to start, at the start, like I said, when it’s telling you off for not achieving your goals...that can be quite disheartening because if you’re like, well, I’m doing it, so then, you know, who, who, you know, but you try telling me off for that, it’s my life, you see what I mean?” (C9, male, low risk, to reduce drinking)

Notifications

Almost one third of the interviewees commented that notifications from the app had been switched off – reasons given for this was that they were “annoying” or generally disliked. In most cases, it was unclear if it was the content of the notifications that was annoying or disliked, or just that these individuals did not wish to receive notifications from an app in general. For example, a couple of interviewees commented that they always turn notifications off for all apps.

“Yes, you know, I’m 46 years old, I probably don’t react so well to being prodded. I guess that was one of the things that I...which I just found annoying.” (C7, female, high risk, just curious)

“I probably had it switched off, I tend to switch notifications off, it’s just, I don’t know.” (B1, male, high risk, to reduce drinking)

A couple of interviewees also stated that they turned off the notifications due to the concern that others would see a notification from Drinkaware specifically:

“I think because they were just pinging... and I was just thinking, I don’t really want to read this right now. Obviously, and I don’t know whether they do but I guess most people check their phone when something pings in and you can be with your friends and actually maybe you wouldn’t want to be saying to your friends, I’ve just got a notification from Drinkaware”. (C14, female, high risk, just curious)

Another interviewee commented that he found the purpose of the notifications unclear, as the notification “opens the app without telling me what it’s for”. Another individual found the notifications acceptable, but added that they don’t contribute to fostering greater motivation to change behaviour:

“...when it actually comes to it, the motivation doesn’t really add much for me by...the notifications. My own personal guilt of breaking what I’ve started out to do is enough to keep me going.... I mean, it’s not unhelpful but it doesn’t make a lot of difference to me”. (C17, male, high risk, to reduce drinking)

Finally, approximately another third of respondents commented that the notifications were “acceptable”, in terms of timing and frequency – with a couple stating specifically that they had kept them to the default setting.

“I think that’s quite a fine balance. Yes I think it was regular enough. I mean I have some...I have another app that like bings you every day and tells you off if you haven’t done what you’re supposed to do and it just...and that just gets annoying sometimes. So I think the notifications are pretty good, pretty well spaced actually”. (C3, female, high risk, to be healthier)

In terms of the usefulness of the notifications – a few respondents (those who reported finding the notifications acceptable or well-liked) reported that they were a good tool for prompting self-monitoring (i.e., recording drinks), with one user commenting that notifications served as good reminders to stick to goals.

“Yes, I like the notifications – if I have forgotten to track it will remind me”. (C8, female, low risk, to be healthier)

“And also, when you get a reminder that’s related to that goal, it’s nice as well. So, when it comes up, it says, oh, remember, you said you were going to drink one less today. I thought that’s nice as well. It’s a nice reminder. So yeah, that one worked well. Yeah.” (C10, female, high risk, to reduce drinking)

Awards

Generally speaking, awards were well received by the relatively small subset of interviewees who specifically commented on them, with a couple noting that the awards were appreciated, but not considered directly relevant to them:

“They’re kind of I guess nice to have. That’s not the driver for me but I guess it is nice to have that message reinforced in some way that obviously you have achieved what you set out to....I wouldn’t say personally speaking that really kind of eggs me on but at the same time it is nice to have that message reinforced”. (C11, male, high risk, to reduce drinking)

A couple of interviewees commented that the awards were “encouraging”, with one female interviewee adding that she “responds well to things like that”. Two other interviewees commented that the awards were helpful, but more specific and personalised awards would be better. One interviewee specifically commented on the awards relating to no drink days rather than simply days of monitoring:

“I think it’s because even if I was having a bit [to drink] I wasn’t having nearly as much as I was [before] and then, you know, like it would...I did get a little thing to say, oh you’ve inputted for five days, you’ve inputted for ten days, or whatever that was, but I don’t think I got anything, you know, about having five [no drink] days in a row....As far as I remember I didn’t get anything to say sort of well done”. (C3, female, high risk, to be healthier)

Only one interviewee provided negative commentary about the awards (the same user that found the general communication style of the app slight patronizing; a high risk drinker no longer using the app):

“...and, that was slightly off putting, you know, there are those big stars if you’ve not had a drink or done well, or something”. (B1, male, high risk, to reduce drinking)

Recommendations

As is elaborated in recommendations section 3.11, several interviewees commented that feedback is required over a longer period of time than is currently shown within the app. For example, a couple of interviewees suggested that it would be useful to have feedback presented over the whole year. One individual discussed this in relation to encouraging longer term use, while another commented that the longer term feedback should also come with information on longer term consequences of drinking (or not drinking):

“One thing that I think is possibly missing a little bit is like the long-term effects. So when you’re using fitness apps you aim for like a weight reduction or whatever, and obviously the smoking apps, it’ll say if you smoke this many a day, this is how much you’ll save a year, for example. The long-term stuff can sometimes be quite good for me because it’s like... So if the app said, this is what I drink in one week and it recorded it and then it said, this is like having 2,000 pints a year and the equivalent of this many calories and this... Like it would predict things and not just what you’ve already done. That would probably make me think, that’s quite a lot over a year”. (C17, male, high risk, to reduce drinking)

At the moment, the feedback provided by the app mostly related to ‘outcomes’ of drinking (i.e., calories, money spent and risk level), rather than feedback on the ‘behaviour’ itself. The fact that several interviewees commented that more feedback on actual drinking ‘behaviour’ over time was required suggests that improvements could be made here. For example, specific feedback on actual units (i.e., ‘risk’ levels are too vague) and inclusion of graphs or visual displays showing drinking behaviour tracked over time would be helpful. This is especially relevant when looking at feedback over a longer time period:

“So I’d like those little traffic lights – the red, amber and green bars – to have numbers on them so that I can see them and add them up”. (C14, female, high risk, just curious)

There also appears to be a requirement for greater personalization and tailoring of general feedback (discussed in more detail in section 3.11). This includes more specific feedback about the consequences of various risk levels of drinking in order to make the ‘risk-level’ feedback more meaningful. This could include, for example, further detail about what risks are specifically, tailored to the demographic characteristics of a specific user. This could also be linked to the user’s initial motivations so that the consequences of drinking are directly tied to their motivation for using the app in the first place. This would make the feedback more salient, and so potentially more motivating. Another interviewees commented that “breaking down the ‘increasing’ risk category further” would be beneficial, for example, by providing more finer grade, sensitive distinctions between risk levels.

Concerning specific aspects of feedback – for the ‘cost’ feedback, there should be more options to input the costs of drinks (within the default options available), including the option of ‘free’ in order to allow users to better track, and so receive more accurate feedback on this component. Other

interviewees also suggested that the app included a ‘walking’ equivalent for calories, as opposed to just running.

In relation to calories, a couple of interviewees had suggested that the app gather more detailed information from each user to enable a more detailed calorie feedback option – for example, it would be useful for the app to say X% of your weekly or daily calories came from alcohol, as calories as a weekly figure is not always meaningful:

“Then you might get it set up that your calories for this week is X number, but because of your drinking so far this week, that has been your calories..... You could even put in something like, 75 per cent of your weekly calories is drink.....For myself personally, to continue using it, I think it needs to be more personalised. If I knew that I was drinking 75% of my calories, you know, my total calories to remain healthy, I’d be thinking, hang on that’s wrong, type thing”. (C12, male, high risk, just curious)

A couple of other interviewees also mentioned that different types of feedback would also prove useful, including feedback on emotional health and well-being outcomes. Again, this is something worth exploring further and may perhaps only be relevant if users are able to tailor and adapt a future iteration of the app to suit their unique motivations and preferences. One interviewee suggested that it would be a good thing to be able to add emoticons (or similar) when recording drinks, and so map drinking patterns to emotional states:

“I guess....one thing I liked to do on the diary app...you could set an emoticon for a day – happy, sad, angry or whatever and you could do a monthly view and it would show you just the emoticon and so I used a red emoticon for a day when I had been drinking and an emoticon for a day that I hadn’t and it meant that I could look back at a whole month and get a snapshot picture of how that month had been and that was actually very useful, and then very quickly, you could look at two months next to each other and say, well, that month has got more red in it than that month and that actually gave a very good picture of progress. I don’t think, although I am willing to be corrected, I don’t think there was that ability within the app. It would compare week to week but when you were looking back at a longer time period, it didn’t allow that comparison quite as much”. (C13, male, high risk, to reduce drinking)

One interviewee commented that the feedback incorporated in the app could be more hard-hitting – and again, more personally relevant to each individual. This individual raises an interesting point in that feedback could show a relative risk associated with each individuals’ drinking habits, potentially tied to life years lost (or similar):

“Yeah, not just generically saying you shouldn’t drink because in the long-term it’s bad for you. It’s like, well, tell me something I don’t know. But if it was personalised and said, this is the long-term effect. I mean, I would even go as far as... I know some people wouldn’t like it but I’d even go as far as saying, if you drink this amount, the risk to your health is like minus three years off your life. And I think that would probably be quite useful to me because then I’d probably weigh it up. If it said like, you’ll have two months off your life, I’d probably think this isn’t a big deal. But if it said it might take ten years off my life, I’d probably think, right, I either need to stop this now or stop it in the short-

term rather than carrying this on 'til I'm much older because it's obviously really bad for me" (C17, male, high risk, to reduce drinking)

One final recommendation made by an interviewee was to link feedback to driving regulations (he was a taxi driver and thought that this would be useful to a lot of people).

"Another thing that might be good is to turn around and let the person know and say something like, are you aware if you were driving you can't drive a vehicle for 18 hours. Something came up on Facebook or one of them and they were saying something like, if you have a bottle of wine tonight you're not meant to drive for another 12 hours. And four pints was something like 18 hours. I don't know how true that it is or what country that may relate to but as a driver, I was taken back a bit by that". (C12, male, high risk, to reduce drinking)

4.10 Usefulness and impact of app use

Awareness

The majority of interviewees, both male and female and representing various motivation categories and baseline drinking levels discussed how the app had increased their “awareness” of how much alcohol they consumed. Several interviewees talked about awareness in general, in relation to being more conscious of units and/or quantities of alcohol consumed.

“Because, just like the name of it, Drinkaware, it made me aware of my alcohol intake, because if somebody, like I said, you know when you go to the doctor then they ask you how many units, like, well how do I know? Do I sit and count my units every night? I don't even know what a unit is. You see what I mean? Where, with the Drinkaware, you know, you're just, rather than sat there with a calculator, which is really boring, nobody wants to do it, all you have to do is write, large glass of wine, boom boom, you've got all your statistics there”. (C9, male, low risk, to reduce drinking)

“It made me think about the quantity and the number of glasses and the size of the glasses. Yes no it did make me think quite a lot which was, you know, it was a really good outcome, so that's a positive thing”. (C7, female high risk, just curious)

Several other interviewees specifically referred to an increased awareness of “binge drinking” – and a realization of what a “low threshold” it takes in order to fall into this category.

“So what I've learnt about my drinking habits is that probably I can do five days a week and not drink but on a Friday or a Saturday or a Saturday and a Sunday then I'll drink more, so I might have half a bottle of wine on a Saturday and half a bottle of wine on a Sunday, but that almost puts me into, well it puts me into a red; it puts me in towards binge drinking”. (C14, female, high risk, just curious)

“I like the fact that it picks up on binge drinking because what I actually found that... well I hadn't actually really noticed that I was doing it. It was the app that made me aware of it. It was that although my consumption was going down and the fact is that I was binge drinking, say one, two or three days of the week, you know, I would drink enough to bump up to an unhealthy level and drinking like that. If you think if doesn't matter if you drink all you can counting all of your units are on one day, know it is still bad for you.” (C13, male, high risk, to reduce drinking)

A couple of other interviewees discussed an increased awareness of ‘units’ specifically, commenting that without the app it is difficult to know how many units are in a drink:

“I think, you know, rightfully the app will point out we are not very conscious of exactly how many units there are in glasses of wine and stuff like that, but when you actually break it down it is quite informative and it's a bit of a wakeup call”. (C7, female, high risk, just curious)

A couple of other interviewees also discussed an awareness of calories, with one individual discussing how, as with units, without the app she would not have been aware of this:

“You don't think of the units in a drink and you don't realise, you know, how many calories are in a drink, you don't think of any of it, besides, you know, they don't put calories and nutrition advice, nutrition information on the bottle of drinks in the UK, do they?” (C9, male, low risk, to reduce drinking)

Another interviewee discussed increased awareness of the financial implications of their drinking habits:

“I suppose I knew it but I switched off on it but now I see it every day or whenever I drink, the next morning I can see it. Apart from opening my wallet, if I was on a big session I tend to look at it and think, oh, there's £20 gone or whatever. And it's there in black and white. So I like that.” (C12, male, high risk, just curious)

Several interviewees commented that the app had made them a more “mindful” drinker or more “thoughtful” about their drinking. In some cases this was mentioned as a pre-cursor to actual changes in drinking behaviour (discussed in more detail below). For some interviewees, this “mindful” drinking led to a general reduction in consumption due to the conscious thought process to “not have one extra drink” that did not happen prior to app use:

“like I was saying before, if we've got a bottle of wine open in the house I would quite easily just walk past it and look at it and think oh go on then I'll have one and I'd pour myself one without thinking about how much I'm pouring myself. And then I'd have forgotten that I'd had it. Whereas if I'm using the app I think, do you want to do this because you're going to measure it later on and you're going to be writing this down whether you like it or not and I think, well probably not then, I'll save it for...you know, I can still have one but I'll save it for when I really want it.” (B2, female, low risk, to be healthier)

Other interviewees discussed the increase in “mindful” drinking as the primary impact of the app. For example, some did not discuss other ‘outcomes’ of using the app. A small number of interviewees discussed specifically that they felt like consumption overall had not reduced, but their “awareness” had improved in relation to their drinking:

“I think it definitely had an impact on what I was drinking and I think in terms of my drinking habits, it's probably not affected it as much as I would have hoped but probably has changed it a little bit....Well, I guess like all these things, I was hoping that it would change my behaviour. I think in reality it just made me more thoughtful about how much I'm drinking, which is probably a good thing”. (C17, male, high risk, to reduce drinking)

Tool for behaviour change

Several interviewees discussed how the app was a tool for regulating alcohol intake, through the provision of support, enhancing commitment and providing information, all of which ultimately helped to increase awareness and reduce alcohol consumption.

A number of interviewees commented that the app provided “support” to regulate drinking, and acted in many respects as a tool to facilitate their decisions to reduce drinking. This ranged from perceptions that use of the app instigated behaviour change (for one ‘low risk’ interviewee who hadn’t initially wanted to reduce drinking), to (more frequently cited) a perception that the app was a useful “tool” to enable the individual to change behaviour if they had already decided to do so. In other words, interviewees reported that they had already “made a decision” or had a “drive” to reduce drinking, but the app made this process easier. Almost all of these comments were made by male interviewees who were classified as ‘high risk’ at baseline.

“...without it I don't think I would actually even have considered cutting down. I mean I was considering it, but I don't think I would have actually come to doing it”. (C9, male, low risk, to reduce drinking)

“I attribute a lot of it [reduction in drinking] to the app I guess because it's a tool isn't it? I mean obviously I wouldn't have achieved it without the wish to do something as well personally, the drive to cut down my drinking, but I think that app is a great tool to help you achieve that”. (C11, male, high risk, to reduce drinking)

“You know when you are not doing the right thing sometimes you need to commit to something else which will take you in the direction you do want to go in.....Something like the app in a very small way just because I made a decision to use it and I continue to use it it's something that will help, then that has helped in that way”. (C15, male, high risk, no information)

A couple of other respondents commented that the app provided “motivation” and kept them “on track”, thus regulating alcohol consumption via that mechanism:

“.....it's a sort of incentive thing that keeps you on course and sort of moves you towards that goal, that otherwise can be really difficult to advance in....especially, when you're drinking you tend to be in a very social sort of situation. It's very, very easy to just slip back into how you were before or to just, yeah, go on, I'll just have a another, and things like that. And so it's nice to have something completely external from that, that sort of just keeps you on track. (C10, female, high risk, to reduce drinking)

“I quite like the app tracking these things, it, kind of, just helps keep me motivated, keep me on track really”. (C8, female, low risk, to be healthier)

For a small number of interviewees, classified as ‘low-risk’, the app provided “re-assurance” that their levels of drinking were “healthy” or “fine”, with one individual commenting that although he had not changed drinking, this was not his intention when using the app:

“No, no [app has not changed drinking]....having found that I am not drinking to excess or to a bad problematic level, it’s been quite reassuring to know the amount I’m drinking is you might say fine, so I haven’t had to change anything...knowing that I am, you could say, healthy and not overdoing it or if I had a particularly bad day, drunk far too much then doing a few days of not drinking after that so it balances it out”. (C16, male, low risk, just curious)

One interviewee commented that the app had provided information that enhanced his understanding of the effect that alcohol was having on his body. This individual was low risk, but was motivated to reduce drinking predominantly by health and appearance reasons:

“Well, there was, like I said, there was some of the, the links that provided, or within the app itself, so I just skimmed through them, you know, and yes, that’s all. For me it was more, sort of, an understanding of how exactly, you know, alcohol was affecting your behaviour, your way of thinking and your body physically, you know, and what are the changes and benefits will be from not drinking, if you know what I mean....And that was very important for me to find out that information in order to make those changes”. (C9, male, low risk, to reduce drinking)

Another interviewee described how the app had provided useful insight into how drinking patterns were associated with wider well-being. This interviewee previously mentioned that the app was a tool for regulating drinking, with a broader goal of improving mental health:

“I’m [now] completely aware of how everything connects up because if I...when you’re drinking less you sleep better and you’re happier and healthier in your mind and your body so I just...I’m so kind of convinced that everything that you do is connected up, so although, you know, when you just...if you can think about...if I’d had 250 milliliters of wine every night I would have that many calories in me and it would be...it would have that many chemicals. But, it’s not just about that, it’s about...like about knowing that I don’t...you know, you don’t need a drink to relax”. (B2, female, low risk, to be healthier)

Several interviewees stated that they saw the app was a useful tool to “regulate” drinking and keep it in “control”. A couple of interviewees specifically commented that their goal was not to stop drinking completely, but to reduce their consumption to a level that they are “comfortable with”.

“I think it’s...it’s more the control aspect rather than...it’s not necessarily I think, oh god, I really need to cut it down. It’s just more knowing how to control it more than anything”. (C5, female, low risk, to be healthier)

Changes in drinking behaviour

The majority of interviewees discussed some changes made to their drinking behaviour (in addition to changes in awareness). Interviewees discussed generally drinking fewer units, often tied to their greater ‘awareness’ or ‘mindfulness’ surrounding consumption.

"I think it has because I now know and have a good idea over a couple of months, which I think is probably representative of what I drink. And I think it probably also has changed my behaviour, both in the amount that I drink but also in what I think about before I start drinking.....I would hazard a guess at like, ten to twenty per cent, probably in reduction. So not a lot.... it's more that I think about it. And when somebody says, shall we go out for a drink or I think, shall I have another one, I'll just be thinking how much is that costing me, in like every way, not just in money". (C17, male, high risk, to reduce drinking)

"...don't get me wrong I've had one or two nights out since using the app, even since reducing my alcohol where I've gone above the recommended amounts, but I've still drank way less than I would have done in the past". (C8, female, low risk, to be healthier)

Several interviewees (of differing motivations and risk profiles at baseline) spoke about how the app had increased their number of 'no drink days', which aligns with the themes presented earlier in the report, that there was an overall perception that reducing drinking by incorporating no drink days was "easier" to achieve. This also reflects the findings of the quantitative report indicating that this the most frequently set goal across all follow-up time points.

"I now have it down that I have a minimum of three, if not four days, sometimes five days' break between drinking". (C12, male, high risk, just curious)

"...so what I was doing, I was trying to make sure that I wasn't drinking in the week, and then...so I was having like long bursts of no drink day, no drink day, no drink day and that was really, really positive and then when you looked at it over a month it looked fantastic". (C3, Female, high risk, to be healthier)

Interestingly, although the app appeared to increase 'awareness' of binge drinking, a couple of interviewees commented that it had very little effect on pre-planned "big" nights - in the sense that it didn't seem to affect 'binge' drinking if the intention already existed to "drink a lot". Interviewees did however mentioned that the app may have helped them to reduce their drinking in other ways, specifically consuming 'less' during a binge session, or drinking less on other nights:

"if I go out and I'm on one a bit then I'm going to drink a lot. I'm just having a good night and there is no way I'm going to be curbing it. What the app does, is say the night is maybe tailing off a bit it's easy for me to just think oh that will do now..." (C15, male, high risk, no information)

"I think it depends, that sounds bad, it depends what sort of drinking I'm doing. If I'm out on like...for example I had a hen party, I think it plays probably no role because I'm just...you know, you kind of accept that it's going to be a big night and that's it. I don't think it's changed that sort of...I suppose it's a binge drinking where...but I think the nights where I might go out and have three glasses of wine I would...you know, if it's just a sort of go out and have a few...you know, what would have been a few, it might be a little bit less". (C3, female, high risk)

Only a very small number of interviewees spoke specifically about how they now drank one or two drinks less on each drinking occasion, consistent with themes earlier presented regarding the general lack of engagement with the 'drink one less' goal. This finding is also reflected in the quantitative report which shows that the 'drink one less' goal is least frequently set at all follow-up time points. However, some interviewees did comment that they had intended to reduce the quantity (rather than number of occasions) that they drank:

"I'm probably coming down slightly....I'm probably drinking around I don't know around six pints say if I go out, whereas sometimes I could probably drink around eight, so it's helping in that way". (C15,

male, high risk, no information)

Although the majority of interviewees did report that the app had some positive impact on their drinking habits, one individual mentioned that the influence of the app had been less than they had initially anticipated:

"I think it's changed a bit but maybe not as much as I might have idealised at the start". (C17, male, high

risk, to reduce drinking)

One interviewee explicitly stated that the app had no effect on alcohol consumption (this individual was 'low risk' initially and not motivated to 'reduce drinking'), whilst another stated that the app may have inadvertently increased their drinking:

"To be honest, in a way, I think it's probably made things worse, because while I might have been interested in pursuing a programme, like, you know, following that and trying to do something about it, it's just forced me to go off the app, delete it, and forget all about the idea. Do you know what I mean? So, I might even be worse off after the app, rather than better off. I'm not, of course, blaming the app, my responsibility lies entirely with me, of course, as with anything else. But, I think you can see where I'm going, I really don't think it's helpful, actually". (B1, male, high risk, to reduce drinking)

4.11 Use of the app over time

We asked interviewees who were currently using the app on their intentions to continue using the app in the longer term and queried interviewees who were ex-users on their reasons for discontinuation.

Positive intention to continue with app

The majority of respondents reported positive intentions to continue with the app, to either help facilitate further reductions in drinking, or to prevent relapse if drinking gets “out of control” again. These tended to be the same people who reported that the app was useful to promote increased awareness or an actual change in drinking (outlined in more detail in section 3.10).

“Oh I'm looking forward to it, because I'm just coming up to the end of the month, that will give me statistics for the previous two months and then in future I just, just as an experiment, every time, you know, I just push myself further and see how long will I actually last without a drink. And funnily enough, with the app, I thought it would be really difficult, but how easy actually I found it, to cut down to almost nothing; and so I'm looking forward to using it in the future” (C9, male, low risk, reduce drinking)

Discontinuation of app usage

For the two ex-users who reported no desire to continue with the app, negative views surrounding app design or functionality were expressed, and appeared to be stronger determinants of discontinuation of app usage than no longer requiring support to cut down on their alcohol consumption.

The overall attractiveness of the Drinkware app was mentioned as an important factor in determining user retention in the long term:

“...and the Drinkaware one is not attractive if you know what I mean.” (B2, female, low risk, to be healthier)

Privacy concerns were also additionally mentioned as a reason for discarding the app. This included not wanting to be seen to be recording alcohol intake during social drinking occasions, fear of judgement regarding the amount consumed if information entered into the app is overseen and privacy concerns surrounding the drinking data entered and stored on the phone in the event that the phone is lost.

“...but I remember one evening when my in-laws were over and one of them was fiddling with my iPad and I was thinking oh god, I hope that nothing flashes up because they're going to think I'm an alcoholic if it does. So I was...maybe there's a way of kind of putting on discreet mode or doing...like having the icon for Drinkaware, the actual app itself being perhaps...like having an option to make it a bit more discreet if you want it to be” (B2, female, low risk, to be healthier)

“So I thought that, you know, if I lost my mobile phone or something and someone accessed my data, they would immediately go to the page it was on” (A2, female, high risk, no information)

Inconsistent app usage over time

A number of interviewees reported intermittent periods of app usage, tending to self-monitor drinking consistently for a period of time, followed by periods of non-usage. Subsequent re-engagement with the app may or may not be planned. Drop-off following a period of consistent monitoring appeared to be prompted by either an external event that interrupted habitual phone usage, through frustration with certain aspects of the app or diminishing interest in recording drinking over time.

"I've been a bit lazy with it. I think, you know, like with a lot of apps and new toys really, you know, you are kind of eager to begin with and then it's tailed off..." (C15, male, high risk, no information)

"...sort of, for my curiosity to go through it for a couple of weeks and then I kind of...it didn't kind of do what I expected it to do, so I ended up stop using it." (C7, female, high risk, just curious)

"I quite like things to be accurate and when it's not I just kind of give up, so I've had a look at the sort of options for improving things and it's never quite what I would drink." (C5, female, low risk, to be healthier)

Where usage was interrupted by an external event, interviewees mentioned 'forgetting' to start recording drinking again. This would suggest that the app may benefit from incorporating a revised alert system to prompt self-monitoring in users who may have dropped off after a certain period of time. It did however appear to be the case that, once a user has disengaged with the app, the app is then often deleted from the phone, along with any other applications that are not interacted with on a regular basis. Thus, it would appear that encouraging habitual self-monitoring using the app may be a priority for encouraging user retention over time:

"My phone is quite full so ...I delete all the stuff that I'm not using on a regular basis." (C7, female, high risk, just curious)

"Because, you know, when I decided I can't be bothered with this I, kind of, just deleted the app from my phone, and promptly forgot everything about it, more or less." (B1, male, high risk, to reduce drinking)

"What happened is I was being really good at inputting and then I changed my phone and unfortunately I wasn't able to then bring the information zone, which I think had quite a negative impact on me because I'd been doing so well and then I lost it all and I have to say it did...it threw me off a bit, as in I had a...like a couple of weeks where I wasn't bothering to do it anymore, which was a shame." (C3, female, high risk, to be healthier)

Usage in the future

A number of interviewees currently engaging with the app expressed positive views towards the idea of continued usage in the longer term. The ability to control consumption through self-monitoring and recording progress over time were both mentioned as key determinants of satisfaction with the app. Many interviewees saw recording of their consumption patterns in the

longer term as ‘evidence’ for positive changes made, rendering these more tangible and ‘real’ and also making it more difficult to ignore any negative trends in consumption:

“I haven’t thought about stopping. I think it still does feel really good to log everything and especially when you know you’ve done well. It’s almost like I look forward to it. And I’m like, yes. I’m looking forward to getting that little star.” (C9, male, low risk, to reduce drinking)

“if you are not counting or looking back on your history of using the graph and thinking, oh what was I like last month or what have I been like last week, if you don’t have that record there, it can all disappear into a blur and you can kid yourself that you are not being too bad, with the app it’s all there, you can’t hide it.” (C4, female, low risk, just curious)

Some interviewees did however note that the app needs to incorporate more features that maintain their interest in self-monitoring drinking behaviour over time.

You know, I would really be still interested in an app of this type, but I would need it to be way more attractive, and much better...like, because I would like to know what I drank on all the public holidays, on Sundays, over weekends, during the week, Monday, whatever, over a period of time (B1, male, high risk, to reduce drinking)

This appeared to be especially the case for those who had reduced their drinking to a level that they were currently satisfied with and were no longer motivated towards making further reductions.

“I would be a bit surprised if I’m still using it after a year because I think I’ll have got what I feel I need out of it. Because I can see how much drinking, how many calories that is, how bad that is for me and how much it’s costing me. I probably will have learnt those things and feel like I’ve got what I need out of it.” (C17, male, high risk, to reduce drinking)

“..now I’ve got to the stage that the weeks became boring because there’s not much change going on there because I hardly drink anymore”. (C9, male, low risk, to reduce drinking)

Where user interviewees may have stopped using the app, a number mentioned that they would consider using it again in future if they felt that their drinking once again needed controlling. This may be, for example, in future situations where consumption had increased and users required support from an external tool.

In spite of not currently entering data, a number of interviewees appeared to have retained the app on their phones as a form of ‘insurance’ against future relapses to a previous drinking level:

"I will, I won't say that I won't download it again because I thought it was quite handy.... I would, you know, certainly if I want to have another, sort of, crosscheck on a week or something, to bring that up and go through that initial stage." (C7, female, high risk, just curious)

"I will keep it on my phone for the next time, unfortunately inevitably I will probably end up having to use it." (C13, male, high risk, to reduce drinking)

Switching to alternative apps

For many interviewees who had discontinued or reduced their usage of the Drinkaware app over time, this resulted from their switching to an alternative, rather than ceasing to self-monitor alcohol consumption completely.

MyFitnessPal was most commonly mentioned by interviewees, favoured over the Drinkaware app as it was thought to provide more accurate feedback on the calorie content of drinks and the interface was considered easier to use for recording the amount of alcohol consumed. Furthermore, users appeared to like the fact that MyFitnessPal provides an overview of alcohol consumption in the context of wider dietary and exercise practices, providing users with what they felt was a more holistic interpretation of their health behaviours.

For some interviewees, the specialized focus of the Drinkaware app was seen as a limitation, and they expressed a preference for an app that would allow self-monitoring and provide feedback on a more complex range of health behaviours:

"I use MyFitnessPal so you can put in what food you've eaten, what drinks you've had, including alcohol and what exercise you've done, so it's kind of...it kind of covers everything. So I'm still recording the alcohol that I had, just in a different way." (C5, female, low risk, to be healthier)

"it's probably easier for me to capture my alcohol consumption on something like My Fitness Pal which also enables you to capture what you are drinking and how much of it, the calorie content and how good or bad it is for you, but then it gives you more of a holistic picture on what you've been doing during the day." (C7, female, high risk, just curious)

Furthermore, a number of interviewees also mentioned that they would like for the Drinkaware app to connect to various other health apps that they are currently using simultaneously, allowing for data from all sources to be combined to provide a more coherent overview of the cumulative health effects of their current lifestyle:

"Well the thing with my other apps, so I've got a Fitbit that talks to My Fitness Pal. Having the Drinkaware talking to something else that then could talk back to it would be helpful....it could give me a prod and say, okay based on what you've put into this central app that you are using this is how you've done and this is what you've achieved, and this is how you compared to last week and stuff like that from an alcohol perspective and a unit's perspective and a health perspective." (C7, female, high risk, just curious)

Additional features to encourage long term usage

Interviewees suggested a number of improvements and alternative features that could be incorporated into the Drinkaware app to promote longer term usage. The main criticism of the Drinkaware app is that the current iteration does not allow interviewees to easily view their progress in reducing consumption in the longer term (e.g. for periods of more than a month). Being able to view progress over time was considered important, with interviewees recommending that the app include a clear visual summary of longer term consumption patterns. Interviewees noted that receiving feedback on longer term trends in drinking, and being able to map these to specific days of the week or months or the year, or to other calendar events, would encourage self-monitoring of drinking in the long term. This form of tracking over time had been appreciated in other health apps:

“..with the NHS one you could look at the whole year; and I’ve never found a way that you can do that with the Drinkaware one. I think the most you can look back over is a month....I suppose because I am someone that is quite religious about doing it and have had it for a long time it was quite helpful to see...am I drinking more than I was this time last year?” (C6, female, high risk, to reduce drinking)

“It might give you a real big overview, say if you’ve been doing it for a year, it might give you a whole overview of how you’ve done in that year and how much you’ve saved, and how much...things like that. That might be quite helpful, to really look at it quite broadly.” (C10, female, high risk, to reduce drinking)

Interviewees also mentioned that they wished the Drinkaware app included more useful hints and tips on how to reduce consumption and maintain reductions in drinking in the longer term. Including information on how to manage relapses is likely to prove helpful for users intending to maintain changes made to their drinking behaviour, especially if this is combined with information previously gathered through the app on likely ‘weak spots’ that trigger consumption:

“And, you know, strategies to try and reduce drinking. You know, like swapping drinks and like, you know, going to different places, rather than going into a situation where you would normally have a drink, doing something different.” (C5, female, low risk, to be healthier)

“Potentially, you know almost a kind of a thought for the day maybe pop up. I use a diet and exercise app called Moom which is one of the best that I have ever found... what it will also do is that it will pop up a couple of articles that is called on, you know, some research that has found a methods that prove effective or check things that you can use to try and improve things” (C13, male, high risk, to reduce drinking)

Recommending the app and willingness to pay for the app

Interviewees were also asked about whether they had, or would be willing to recommend the app to others, and whether and under what circumstances they would be willing to pay for an app to assist in moderating their alcohol consumption.

A number of interviewees had already recommended the app to others, including partners, family members, colleagues and friends. The general consensus among these individuals was that the app was only likely to be downloaded by others who felt ready’ or were sufficiently ‘motivated’ to cut down on their drinking.

This reasoning maps closely onto the Transtheoretical or ‘Stages of Change’ model of health behaviour⁸, which suggests that it may be easier to encourage behaviour change in individuals who are in the more progressed ‘contemplation’ or ‘action’ stages of change (i.e. are already considering the promoted behaviour), than those who are in the ‘pre-contemplation’ stage of change (i.e. are not yet considering changing their behaviour).

“I did recommend it to my boyfriend actually, who saw me using it, and although he...he’s actually downloaded it now and although he just sort of...I don’t know how much he wants to reduce it. I think he’s more just interested in looking at it” (C10, female, high risk, to reduce drinking)

“No- one has taken me up on it so far. I think they all, a bit like I was you know when I first downloaded it, it’s like they know they are not going to like what it’s going to tell them, so they bury their head in the sand and not do it. I think you’ve got to be in the right frame of mind, I guess, to be looking to, you know, willing to make some, sort of, change. Maybe you will start, I would say massively its supportive if you are even slightly thinking about making a change or slightly conscious of it, it’s been really helpful.” (C8, female, low risk, to be healthier)

“I have mentioned it to some people and they just go, no chance, particularly people, perhaps who drink quite a lot, so” (C4, female, low risk, just curious)

Leveraging user recommendations to target family and friends who are more likely to be considering making changes to their drinking may be useful way to prompt new downloads. This would require that the app incorporate a feature to help users to identify significant others who may be considering reducing their alcohol intake and signposting these individuals to the Drinkware app, perhaps via email or text message.

Associated with this, a number of interviewees also mentioned that they would be keen for the app to incorporate a feature that allows their progress to be compared with that of their friends, although privacy concerns are an obvious issue to take into account here:

“That’s the only thing I can possible think of that you could maybe use it to, sort of, see how you are doing with friends and things....maybe just high level data, I wouldn’t necessarily want other people knowing exactly what I’m drinking..” (C16, male, low risk, just curious)

“If could get any of my friends to use it we could have some kind of connectivity with my friends.” (C8, female, low risk, to be healthier)

Regarding payment for the Drinkware app, the majority of interviewees both preferred and more commonly downloaded health apps that were free of charge. Interviewees did not however seem to be specifically against paying for an alcohol related app if this was considered to be of superior quality and contained more useful features:

⁸ Prochaska, J & DiClemente C. (1983). Stage and process of self-change of smoking: Toward an integrated model of change. *Journal of Consulting & Clinical Psychology*, 5:3, 390-395.

"I will usually go for ones that are free, but if I'm really interested in something I will pay for it. (C8,

female, low risk, to be healthier)

"Mainly the free ones but if it's something that's recommended and has good reviews then I will pay...And actually sometimes I think with health things, if you've invested something in it, like monetary wise, I think it holds a little bit more value." (C3, female, high risk, to be healthier)

"I would generally prefer to pay for a good app than have a crap free app, to be honest. I wouldn't say it's across the board, but in my experience, you know, if you pay for it it generally is better than the one you don't pay for." (B1, male, high risk, to reduce drinking)

Recommendations

To encourage usage of the Drinkaware app in the longer term, changes may need to be made to both the design and content of the app. Only two respondents reported that they were not satisfied with the attractiveness of the app (in these cases this appeared to be a strong determinant of their dis-continued usage) so limited recommendations can be drawn about the design. A more consistent theme reflected the desire for feedback on longer term trends in drinking. Thus, the inclusion of a visually appealing means of feeding back information on longer term drinking patterns, and possibly linking these to calendar events (e.g. birthdays, holidays, weekends), may enhance user retention over time.

Improving the privacy of data entry into the app may also help to allay the fears of certain users. This may include the addition of a password to enter the app or unlock previously entered data, or developing an easy to access 'data entry' mode, wherein users can record drinks more quickly and easily on a front screen that does not contain colourful visuals and eye-catching branding. Designing a more discrete way of recording drinks may also help to encourage real-time data collection and increase the accuracy of subsequent feedback, itself likely to enhance retention.

One further recommendation on how to increase longer term usage of the app may be to incorporate a number of features designed to prevent relapse to former drinking levels. These may include using information from the 'weak spot' feature to help users avoid possible trigger locations or situations, incorporating problem solving techniques for dealing with high risk situations (e.g. how to manage consumption during social events involving drinking), providing information on possible substitutes for alcohol (e.g. alternatives to alcoholic beverages or alternatives to social events involving alcohol), incorporating a social support feature (e.g. a nominated friend may be alerted when certain drinking patterns recommence), and information on how to avoid absolutist thinking (i.e. seeing a slip-up as a lapse rather than a relapse).

4.12 Recommendations for additional improvements

Further recommendations and comments on how the app may be improved and aspects of the current iteration that were particularly appreciated by users are outlined below:

Simplicity

In general, interviewees mentioned that apps that are simple to interact with are more commonly favoured. This should not be confused with simplicity of the information included within the app, with users generally favouring more complex and personalised feedback. Hence, an optimally designed app should include information that users consider sufficiently complex to be valid and relevant to their personal situation, but that care should be taken in how this information is presented. Clear communication and attractive visuals should be prioritised:

“You know, as long as it stays, it stays that easy, you know, to use, then that's fine, as soon as it, I know that there's a few apps and I think that's the reason why I've stopped using the other app, it just became too complicated, it was just taking up too much of my time in order to set up and check and things like that, you know, so whereas this one just literally takes seconds, if that, and you've got all the information you need.” (C9, male, low risk, to reduce drinking)

“I think the interface is really very simple, I wouldn't change that, I like the simplicity and the simple way of adding things”. (C13, male, high risk, to reduce drinking)

“One thing that I like about this app and on other apps is like the visual...like the icons and stuff. It makes it appealing to use and it's not difficult to put stuff in and it gives you graphs and stuff.” (C17, male, high risk, to reduce drinking)

Connectivity

A number of interviewees appeared dissatisfied with the fact that information entered into the app and onto the Drinkaware website did not sync up with each other. Thus, if information was entered onto the phone, and the phone subsequently upgraded or misplaced, interviewees mentioned losing the data that they had entered.

“Because it's almost like you expect it to be kind of saved on a...because I've got the same email address and the same everything...I just literally swapped the device. So I was quite surprised to sort of lose all that. When you've done well that was quite gutting.” (C3, female, high risk, to be healthier)

“Interviewer: So just going back to your main reasons for stopping using the app, so you've mentioned one of the problems was that it wasn't synchronising with the website.

R: Yes.” (A2, female, low risk to reduce drinking)

Further recommendations surrounding connectivity centred on requests for the Drinkaware app to be linked to other health related apps that the interviewee may currently be entering data into. Specifically, interviewees mentioned that the calorie and exercise information available in the Drinkaware app should be made more interactive (e.g. using the accelerometer imbedded in the

phone to determine calories burnt through activity and discounting this from alcohol calories consumed):

"Well the thing with my other apps, so I've got a Fitbit that talks to My Fitness Pal. Having the Drinkaware talking to something else that then could talk back to it would be helpful." (C7, female, high risk, just curious)

"maybe linking them in so that, so that it just, as you walk or as you exercise or as you run, those calories come off that total count, because at the moment it's just information you see, it's not interactive." (C9, male, low risk, to reduce drinking)

"I guess the only thing is maybe, but it's not really necessary, but thinking about that kind of calorie feature, maybe cross-referencing it with how many you're burning." (C11, male, high risk, to reduce drinking)

Personalization and tailoring

Interviewees frequently mentioned that they would like to receive information from the app that is more carefully personalised to their current drinking habits and lifestyle. This is supported in the wider literature; specifically that tailoring can increase effectiveness of health related interventions⁹ in general, and specifically in mHealth interventions¹⁰ This may include feedback of risk information tailored to specific demographic characteristics of the user, or that takes into account personal medical history, advice on how to cut down that is relevant to the users' specific circumstances and considering individual motivations for losing weight and tailoring subsequent feedback based on this information:

"I'd like it to be more personalised and relevant to me if I was to continue using it." (C12, male, high risk, just curious)

"I want it to be mine rather...my drink and I want to be able to manage my consumption, you know, with strategies and a bit more personal rather than, oh, you're like all the other idiots that have a couple of beers every night." (C5, female, low risk, to be healthier)

"Yeah, not just generically saying you shouldn't drink because in the long-term it's bad for you. It's like, well, tell me something I don't know. But if it was personalised and said, this is the long-term effect. I mean, I would even go as far as... I know some people wouldn't like it but I'd even go as far as saying, if you drink this amount, the risk to your health is like minus three years off your life." (C17, male, high risk, to reduce drinking)

Personalisation of app content presents a challenge given that it may require large amounts of input data and evidence-based ways of tailoring feedback to users (i.e. which individual characteristics are important determinants of drinking behaviour, and can these be readily measured using an app?).

⁹ Hawkins, R.P.; Kreuter, M.; Resnicow, K.; et al. Understanding tailoring in communicating about health. *Health Education Research* 23(3):454–466, 2008. PMID: 81349033

¹⁰ Head KJ, Noar SM, Iannarino NT, Grant HN. Efficacy of text messaging-based interventions for health promotion: a meta-analysis. *Soc Sci Med* 2013 Nov;97:41-48.

Requiring users to input large amounts of personal data during on-boarding is likely to discourage usage of the app in the first place. Thus, it may be more useful if the app provides more generic feedback during the first month of usage, following which point, users may be prompted to provide further data on their drinking habits and triggers, thereby enabling personalisation. It may be valuable to conduct some pilot research to determine how much information users are willing to provide in order to receive a more personalised offering from the Drinkaware app, and consider issues surrounding privacy and data confidentiality.

Additional behaviour change techniques

A number of users mentioned that they wished the app would include suggestions for ‘replacements’ for drinking, and additionally, more specific information on techniques that could be employed to help cut down drinking:

“like a goal could be to replace a glass of wine with 15 minutes of yoga or...do you know what I mean?” (B2, female, low risk, to be healthier)

“...but the education side, how do you try and get out of the yellow. Like what ways can you actually...how can you change your behaviour rather than just see that you’re in the yellow.” (C5, female, low risk, to be healthier)

Several established ‘behaviour change techniques’ (BCTs) incorporate the concept of focusing on ‘alternatives’ to the target behaviour – including ‘behaviour substitution’, ‘distraction’ and ‘reward alternative behaviours’¹¹. These BCTs could be incorporated into the app, for example through notifications and feedback components.

Closely related to this idea of helping people to cut down by providing ideas for alternative behaviours is the notion of ‘Implementation Intentions’, which are specific ‘if-then’ context-specific plans on how to change behaviour¹². Encouraging individuals who are intending to make a change to their health behaviour to elaborate upon the strategies that they can use to achieve their goals has been showed to help bridge the gap between intentions to change and translating these intentions into effective action¹³. Including an app feature that encourages users to elaborate on when, where and how they intend to cut down on their drinking may assist those who are struggling to manage to reduce their consumption levels.

Elaborated risk information

Some interviewees mentioned that the app could be improved through inclusion of more information on the negative effects of drinking, with an interest in this information being

¹¹ Michie, S. The Behavior Change Technique Taxonomy (v1) of 93 Hierarchically Clustered Techniques: Building an International Consensus for the Reporting of Behavior Change Interventions. *Annals of Behavioural Medicine*; 2013; 46(1): 81-95.

¹² Gollwitzer, P. (1999). Strong effects of simple plans. *American Psychologist*, 54 (7), 491-503.

¹³ Armitage, C. Conner, M. (2000). Social cognition models and health behaviour: A structured review. *Psychology & Health*, 15(2), 173-189.

contextualised to take into account a user's wider health or sociodemographic profile. For example, including a feature that explains how alcohol impacts on both short and longer term health outcomes, as well as effects on mood, activity levels or productivity.

As noted above, finding ways to personalize this information is also likely to increase its motivating potential. Tailoring risk feedback to easily obtained demographic information (e.g. gender, age, ethnicity) may be one way to offer more personalised content to users without necessitating further data collection:

"We know that units are one measure of health and wellbeing, the alcohol content is obviously linked to that. It seems to be a single dimension when it should be part of the rest of your world." (C7, female,

high risk, just curious)

"various things, risk factors and how it affects sleep et cetera et cetera...I don't think I was aware that it affected your health and alcohol could lead to certain cancers, I've never thought about for example bowel cancer and I would associate it with cirrhosis of the liver, it did make you aware of other health risks." (C4, female, low risk, just curious)

"One thing that I think is possibly missing a little bit is like the long-term effects. So when you're using fitness apps you aim for like a weight reduction or whatever, and obviously the smoking apps, it'll say if you smoke this many a day, this is how much you'll save a year, for example. The long-term stuff can sometimes be quite good" (C17, male, high risk, to reduce drinking)

5.0 Discussion

This qualitative report forms one component of a wider evaluation of the Drinkaware ‘Track and Calculate Units App’, presenting findings from 21 telephone interviews exploring app users’ perceptions of usability, acceptability and effectiveness of this offering. The majority of interviewees were classified as current app users at the time of interview. The sample comprised a wide range of ages, from young adults to late middle-age, and included users who expressed different initial motivations for downloading the app.

To our knowledge, this study represents the first qualitative investigation of app users’ views on a *commercially* available alcohol behaviour change app. Most existing studies that explore perceptions of app use (including of commercially available apps) have tended to recruit convenience samples (i.e., university students) and either instruct these samples to use a specified app for a given number of weeks¹⁴ or embed a smaller qualitative investigation into a wider pilot study or trial¹⁵. This qualitative investigation thus provides a more ‘realistic’ overview of app users’ perceptions, exploring the views of individuals who chose to download the app of their own accord. As such, this approach does not only allow us to derive ecologically valid insights into app usability and acceptability, but also provides valuable information on the wider context surrounding initial decisions to engage with the app, and on brand awareness of Drinkaware specifically. The main findings presented in this report also aid interpretation of the prior quantitative analysis, providing additional insights into patterns of app usage.

Overall, the app was reported to be easy to use and fairly intuitive, the style of feedback provided by the app was considered acceptable, as was the information provision and notifications/alerts. Mixed views were however expressed regarding the specific content of feedback, with users desiring greater tailoring to ensure that they are given feedback considered most relevant (or motivating) to them.

With respect to user *motivational profiles*, users often mentioned a number of additional motivations for using the app that are not currently well covered in the existing data capture response options. At present, users can only select one motivation option, meaning that additional motivations beyond ‘weight’ and ‘health’ are not picked up on. Specifically, more options pertaining to mental health and emotional well-being appeared to be welcomed by users. This is important as information on app users’ initial motivations to engage with this product could ultimately be used to personalise content.

This concept of greater *personalisation and tailoring* repeatedly emerged as a key theme across interviews, and so should be considered as a central concern to users. Tailoring can occur along multiple dimensions, including tailoring to person-level factors such as age, gender or race/ethnicity, to self-reported motivations to change behaviour, to users’ most salient triggers to alcohol consumption or to preferred coping or behavior change strategies¹⁶. Tailoring can allow for more personalized feedback and for the inclusion of behavior change techniques most relevant to each

¹⁴ Kim J. A Qualitative Analysis of User Experiences With a Self-Tracker for Activity, Sleep, and Diet. *Interactive Journal of Medical Research*. 2014;3(1):e8.

¹⁵ Giroux, D. Bacon, S., King, D. K., Dulin, P., Gonzalez, V. Examining Perceptions of a Smartphone-Based Intervention System for Alcohol Use Disorders. 2014; 20(10): DOI: 10.1089/tmj.2013.0222

¹⁶ Hawkins, R.P.; Kreuter, M.; Resnicow, K.; et al. Understanding tailoring in communicating about health. *Health Education Research* 2008; 23(3):454–466.

individual. As such, tailoring may prompt longer-term app usage as content may be adapted based on how drinking behavior changes over time (i.e., tailored feedback and notifications could relate to maintenance of low levels of drinking after long term use). This would make the app more dynamic and responsive to user input.

With respect to specific features of the app, the findings of this qualitative investigation support the quantitative analysis in demonstrating that the *self-monitoring* aspect was most widely used. With respect to goal setting, the ‘no drink day’ goal was generally perceived as most useful and potentially the ‘easiest to achieve’. Less enthusiasm was expressed for the ‘drink one less’ goal, implying that current goal options may benefit from re-design.

As also highlighted in the quantitative analysis, the *weak spot* feature of the app appears to have limited utility in its present format. This may be underpinned by a general lack of understanding of what exactly setting a weak spot entails. This feature may therefore benefit from a re-design. As the interviewees themselves suggest, it may be that providing support to break cue-dependent associations between environmental triggers and drinking behaviour is not enough, and that this feature could be improved by incorporation of broader cues to drinking such as time of day or mood/emotional states. With this in mind, the app could include prompts that ask users to recall more details about the context of their drinking episodes (at the time of recording drinks). This could include, for example, the presence of others, time of day, mood and location (and potentially other health behaviours such as smoking). This information could then ultimately be utilised to tailor and personalise notifications, feedback and support.

This links to an emerging data collection technique of ‘ecological momentary assessment’ (EMA) or ‘ecological momentary intervention’ (EMI)¹⁷, which refers to ‘real-time’ data capture in natural contexts. This may help in facilitating the development of real time interventions, delivered at the precise point at which they are likely to be maximally effective¹⁸. This approach is not, however, without its own challenges; as highlighted earlier in this report, asking users to record drinking in real time is likely to prove challenging (i.e. most users report that they input drinks at the end of the day). This, coupled with asking individuals to also recall emotional states (in addition to other potentially relevant variables), might simply be too complicated to work in practice, making app use more cumbersome and less appealing to users.

As outlined in the recommendations of section 3.7 (weak spots), and also discussed in relation to comments on tailoring app content in general, a careful balance needs to be struck between collecting sufficient information to allow for greater personalization of app content and user burden of data collection. Nonetheless, we still recommend that some level of EMA (perhaps over 1 week at baseline) could be useful to permit tailoring, and may even be seen by some users as an additional (and favourable) prompt to self-monitoring consumption. It may be that this offering is particularly relevant to heavier or problem drinkers. The application of EMA and EMI to the Drinkaware app is thus a fruitful direction for further research.

In relation to the usefulness of the app for reducing drinking, several of the interviewees (who are still using the app) believed that the app was a useful tool to facilitate changes in drinking behaviour – often tied to increases in “awareness” or “mindfulness” of drinking. Only one interviewee thought that the app had had an adverse effect on their drinking (due to general dissatisfaction with the app)

¹⁷ Beckford, E. & Shiffman, S. Background for real-time monitoring and intervention related to alcohol use. Alcohol Research.

¹⁸ Lagoa CM, Bekiroglu K, Lanza ST, Murphy SA. Designing adaptive intensive interventions using methods from engineering. Journal of Consulting and Clinical Psychology. 2014;82(5):868–878.

and a couple of users suggested the app was more responsible for an increase in awareness than in actually driving changes in behaviour. We do however note that interviewees expressing this view were generally low risk drinkers for whom the app provided reassurance that their consumption levels were acceptable. Very few users continued to engage with the app as a form of 'maintenance' of behaviour change (i.e., continue to use app as a tool to *maintain* their new lower levels of drinking). It is worth Drinkaware considering the usefulness of incorporating extra features in order to promote longer term use to prevent relapse. Alternatively, it may be that the app is simply downloaded again and used in the same way when the individual perceived drinking levels to be too high. At present the cyclical nature of behaviour change is not reflected in the app content; however this would be captured by increased personalisation and tailoring of feedback and information.

Overall, one can conclude that the app is a useful tool to facilitate behaviour change in users who are 'ready' to change (i.e., have a prior motivation to change) and that it does this by providing a means to record drinking and generate a greater awareness of alcohol consumption. In users who are not necessarily motivated to change their drinking behaviour initially, the app provides a useful tool to increase awareness of drinking habits and may or may not prompt subsequent reductions in drinking as a result. The findings reported here cannot be used as definitive evidence that app usage leads to reductions in alcohol consumption, but does provide useful information on how effective app users *perceive* the app to be.

As noted above, this report provides insight into the wider context of app use, given that the interview sample comprised users who downloaded the app in a natural context, rather than for the purpose of a research study. Through the interviews, it was revealed that app users often also engage in other strategies to help monitor and/or reduce drinking in addition to the Drinkaware app. However, this finding should be interpreted with caution given that it could reflect a characteristic of the sample we interviewed (i.e., people who were happy to talk about this topic might be those who are generally more inclined to utilise multiple apps for examples and enjoy discussing their experiences) and thus cannot be generalised to the full spectrum of app users.

In relation to future directions for research into the Drinkaware app, the need for more appropriate study designs for collection and analysis of 'big data' is critical, especially if future iterations of the Drinkaware app are to incorporate insights from EMA and EMI¹⁹. We recommend that a logical next step for Drinkaware would be to conduct a more critical 'behavioural diagnosis', taking into account the complexities of alcohol consumption related behaviours based on the growing body of research evidence in this field. This would include an in-depth analysis of what exactly is required for behaviour change in this context. This approach may result in a list of additional behaviour change techniques that could be used to modify current app features or provide suggestions as to which new features could be incorporated for testing.

'Think aloud' protocols or 'observation of use' designs may be useful future app evaluation methods, especially in instances where more needs to be known about the value of adding or removing specific app components. Future evaluations could potentially also involve A-B testing, similar to previous work conducted via the Drinkaware website. This would test the effect of different versions of the app in different user groups in order to establish which features appear to improve rates of engagement and increase self-reporting of drinking.

¹⁹ Baker TB, Gustafson DH, Shah D. How can research keep up with eHealth? Ten strategies for increasing the timeliness and usefulness of eHealth research. *Journal of Medical Internet Research*. 2014;16(2):E36.

Conclusions

A recent review found that very few evaluations of smartphone apps to reduce alcohol consumption (or to treat alcohol use disorders) are reported in the scientific literature²⁰. The authors of this review also concluded that although advances in smartphone technology hold promise for disseminating interventions among hazardous drinkers, more systematic evaluations are necessary to ensure that smartphone apps are clinically useful. With this in mind, this qualitative investigation of the Drinkaware app, in addition to the prior quantitative report, represent useful and novel pieces of research in this field. Specifically, the initial uncontrolled quantitative analyses enabled exploration of patterns of app use, and a greater understanding of *who* users of the DA app are. The qualitative study adds a more in depth examination of user perceptions of acceptability and usability. Taken together, this work provides list of key recommendations for future app development and directions for research and evaluation – a useful first step in ongoing evaluation efforts.

The Drinkaware app is an acceptable tool to help users self-monitor alcohol consumption, and appears to help increase awareness of drinking behavior and enable users who are already motivated to reduce drinking to better commit to this change. The Drinkaware app may be improved through more extensive personalization and tailoring of content. This latter suggestion is also mirrored in the smoking cessation literature, and specifically, in a recent review that concluded that publically available smartphone smoking cessation apps are not, in fact, particularly “smart”: they commonly fall short of providing tailored feedback, despite user preference for these features²¹.

We additionally note that a critical issue for Drinkaware (as with any other app developer) is that of *sustainability* of app use. Digital interventions or programs of this kind cannot be left unchanged as they will quickly look dated and users will come to expect new ways of interacting with app features, depending on what is popular at the time. Ideally, changes to app content and interfaces may benefit from integration of evidence from a growing literature base as to what works to prompt behaviour change in those who regularly consume over the recommended amount of alcohol.

²⁰ Meredith SE, Alessi SM, Petry NM. Smartphone applications to reduce alcohol consumption and help patients with alcohol use disorder: a state-of-the-art review. *Advanced Healthcare Technologies*. 2015; 1: 47-54.

²¹ Hoepfner, B. B. et al. How Smart are Smartphone Apps for Smoking Cessation? A Content Analysis. *Nicotine and Tobacco Research*, 2016;1025-1031.

6.1 Appendix 1: Drinkaware App data entry and functionality

User data entry and set-up

Having downloaded the Drinkaware app the user is asked to go through an 'on-boarding' process which involves entering information on:

- Gender
- Age
- 'Typical week' of drinking, for each day in a week indicating the type and amount of alcoholic drinks they consume, or indicate if this is typically a 'no drinks day'.
- Key motivation for downloading the app, choosing one of the following pre-set options:
 - 'to reduce drinking'
 - 'to be healthier'
 - 'to lose weight'
 - 'just curious'

Once the user has entered this information they then are presented with the dashboard screen showing their typical week risk level. From here they can access the daily tracker, view their progress graphs, and navigate to the goals and weak spots sections where they can set up the following:

- Goals, choosing between pre-set options:
 - 'no drink day': choosing days in the week where the users wish not to have an alcoholic drink
 - 'drink within guidelines': the user can for a given day choose to drink within a max alcohol unit limit (pre-set as the then guideline level at 3 units for women and 4 units for men, but the level can be adjusted downwards or upwards by the user as desired)
 - 'one less': choosing days when they would drink one (or more, as decided by the user) less drinks on that day compared to the number of drinks entered for the 'typical week'
- 'Weak spots': using geo-fencing technology the user can identify a geographical location where they wish to receive an alert helping them to moderate drinking. The pre-set types of 'weak spots' are:
 - Home
 - Work
 - Bar or pub
 - Restaurant
 - Club
 - Family or friends
 - Shop
 - Custom

The goals and 'weak spot' information can be revised at later time points as needed by the users.

Achievement notifications

Users are awarded achievements based on their activity and the goals they achieve.

- First time use, after completing initial setup.
- Drink logger - Adding first drinks through the logger or graph and saving the data.
- Badge on setup of users first goal (Drink with Guidelines)
- Badge on setup of users first goal (One/two/three Less Drink)
- Badge on setup of users first goal (No Drink Day)
- Badge on successful completion of each goal type after each 7 day period.
 - Drank within guidelines this week badge
 - Had one less drink each drinking day this week badge
 - Had two less drinks each drinking day this week badge
 - Had three less drinks each drinking day this week badge
 - Achieved all NDD's this week badge
- Entering 5 days worth of data in a row, including no drink days.
- Entering 10 days worth of data in a row, including no drink days.
- Entering 20 days worth of data in a row, including no drink days.
- On entering 30 days of data. Does not need to be consecutive.
- On entering 50 days of data. Does not need to be consecutive.
- On entering 100 days of data. Does not need to be consecutive.
- On entering 200 days of data. Does not need to be consecutive.
- Setup users' first weak spot.
- Drinking within the guidelines for the calendar week Monday - Sunday. Each day must have data or NDD for every single day.
- Drinking within the guidelines for the calendar Month. Each day must have data or NDD for every single day.
- Monday - Sunday this week you drank less units that Monday - Sunday last week. Must have entered data or no drink day on every single day.
- This calendar month you drank less units than the last calendar month. Must have entered data or no drink day on every single day.
- Monday - Sunday this week you drank less calories than Monday - Sunday last week. Must have entered data or no drink day on every single day.
- This calendar month you drank less calories than the last calendar month. Must have entered data or no drink day on every single day.
- Badge for opening the app 1 year since setting up the app.

Reminders of goals and commitments

If users have allowed the app to send them notifications, they will get prompts designed to remind users of their goals and commitment to track:

No drink day	<p>'Did you manage a no drink day yesterday?'</p> <p>Push notification always comes the day following a no drink day goal. If they say 'yes' they had a no drink day yesterday then they get a congratulations message and the diary is updated automatically with the 'no drink day'. If they say 'no' then they are taken to the logger to enter what they did drink.</p>
One less drink - reminder	<p>'You've committed to drink X less drinks today. Remind yourself of your goal'.</p> <p>If this goal is active this notification appears daily in the morning. Clicking the push notification will open the goal setup view for one less drink.</p> <p>If the user doesn't typically drink on this day then push notification won't show.</p>
Diary input	<p>Incomplete diary: 'Did you forget to complete your diary last week? Please update what you drank' Monday - Sunday.</p> <p>No activity: 'Did you drink anything last week? Enter what you drank last week to see how you're progressing' if 2 weeks 'We've not seen you for a couple of weeks.' after a month 'We haven't' seen you in a while'</p> <p>Appears once a week if data is missing.</p>
Weak spot	<p>'You're at home. Remember to take it easy' or 'You're at the office. Remember to take it easy', etc.</p> <p>Every time the user enters or ideally approaches a predefined weak spot. Only one notification per day for each given weak spot.</p>
Reminder of 'no drink day'	<p>On the morning of a 'no drink day'.</p>

6.2 Appendix 2: Interview schedule

Procedure

Interviewer:

- Confirm they are speaking to the right person
- Introduce themselves, reiterate purpose of interview
- Reconfirm it is a suitable time to conduct the interview and interview should last approx. 30 minutes.
- Explain the interview will be recorded and will begin by running through the consent form
- Check if participant has any questions
- State the recorder will now be turned on, the interview will be recorded

recorder turned on

- Ask participant to state their name and today's date
 - Ask participant to state whether they agree to each of the following statements
1. *I agree to take part in the above research. I have read the Participant Information Sheet which is attached to this form. I understand what my role will be in this research, and all my questions have been answered to my satisfaction.*
 2. *I understand that I am free to withdraw from the research at any time, for any reason and without prejudice.*
 3. *I have been informed that the confidentiality of the information I provide will be safeguarded.*
 4. *I am free to ask any questions at any time before and during the study.*
 5. *I have been provided with a copy of this form and the Participant Information Sheet.*

All: Introduction

- How long ago did you download the app?
- Are you still using the app?
- (If no) How long did you use it for

Group A: Those who have completed the on-boarding ('my typical week') of the app but no further;

Group B: Those who have used the app for one week or more but have stopped using the app at the time of the survey

Group C: Those who are current users of the app. The questions asked will be tailored according to the group to which each participant belongs.

All: Initial motivation to download the app

- How did you first hear about the Drinkaware app?
- What was your initial motivation for downloading the app? (*probe cutting back if not mentioned*)

All: On-boarding process

- How did you find the process of getting started with the app (easy/frustrating etc)?
- How did you find entering your 'typical week'?
- Do you remember getting feedback on your typical drinking (your risk level)?
- What did you think about the feedback (risk level)?
- Did it influence your drinking (how, why)?
- Did you initially set any goals for your drinking? What goals did you set? Why? [*Drink one less; Drink within guidelines; Drink free day*]
- Did you set any weak spots? Where? Why?

B&C: Using the app over time

- When you first started using the app, how much did you use it (e.g., once per week, every day?)
- What features did you use regularly? (Goals, weak spots, my dashboard, achievements) Why?
- What did you think about the notifications you received? Did you change the default settings? Why?
- How often did you record your drinks? Where and when? Did you find it helpful? Is there anything that could make this process better for you? Why/why not?

C: Using the app now

- How many times per week do you use the app now?
- When do you use the app?
- Which features do you use now? Why these features?
- Do you have any suggestions for improvements to these features?
- Overall, how do you find the app to use?

All: Impact of using the app

- Since using the app, have you changed your drinking? How has it changed? What was the role of the app?
- Your motivation to download the app was X. Do you feel the app has helped you to achieve this?
- Do you think you would benefit from using the app longer term? Why/why not?
- Have you accessed any other information or support regarding your drinking? If yes, were you directed through the app? How did you find this?

C: Willingness to use the app over time

- Do you plan to continue using the app over the next few months? Why/why not?
- What would make you to use the app more in future?

All: General Acceptability

- What do you think about the information provided via the app?
- Had you heard of Drinkaware before using the app?
- Have you ever visited the Drinkaware website
- Would you recommend the Drinkaware app to a friend – why or why not?

A & B: Usage cessation

- Overall, how did you find the app to use?
- Why did you stop using the app?
- Do you still have the app on your phone or have you deleted it?
- Do you think you might ever start using it again in the future?

All: General phone and app usage

- Did you use any other way of monitoring your drinking before using the app?
- Are you currently using any other apps to help to improve or monitor your health? What do you think of these/useful features/ things you like or don't like? Is there anything in these apps which you think could improve a drinking app?
- Roughly how many apps do you have on your phone at the moment? How many of those were free? How many paid for?
- Are you currently using any other apps to monitor your drinking?

All: & finally..

- Do you have any other comments or suggestions to help us to improve the Drinkaware app?

All: Close

- Thank for your time, explain recorder will now be turned off

****Turn off audio recorder****

- Explain that £20 Amazon voucher will be sent out within a week via email (as long as consent form has been received).
- Only to users who have had a positive experience of the app:
Our digital team are looking for people who have used the app to provide user reviews/quotes or to share their stories on our website. Is this something you might be interested in? If so we will pass on your email address to our digital team who will get in touch with you to discuss.

-

Signposting for concerns:

- Drinkline 0300 123 1110
- Contact your GP