Online and face-to-face extended brief interventions for harmful alcohol use: client characteristics, attendance and treatment outcomes

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\textbf{ABSTRACT}
Online service delivery is an alternative to face-to-face interventions for harmful alcohol use. However, little evidence evaluates its relative efficacy or the demographic characteristics of clients accessing these services. Archival demographic and treatment outcome data collected from 82 clients who undertook online or face-to-face extended brief interventions (EBI) were analysed. Measures included a pre-treatment Alcohol Use Disorder Identification Test (AUDIT) and pre/post well-being and drinking behaviour measures. Clients in the online sample were on average younger, scored higher on the AUDIT, were in work/training more days a month and attended a greater number of sessions. After controlling for differences in treatment mode and age, online EBI led to greater increases in quality of life and fewer drinking days. Online EBI may provide an important alternate service delivery mode for harmful alcohol use, which may be accessed more frequently by younger and higher risk clients.

Online interventions are increasingly used as an alternative to face-to-face (F2F) counselling for alcohol problems (Garde, Manning, & Lubman, 2017). Recent systematic reviews suggest that online interventions may be effective for treating addiction in general and specifically harmful alcohol use (Gainsbury & Blaszczynski, 2011; Khadjesari, Murray, Hewitt, Hartley, & Godfrey, 2011). Online interventions can offer particular advantages for a substance-dependent population including convenience, cost-effectiveness and privacy/anonymity (Gainsbury & Blaszczynski, 2011). Online interventions can be autonomously delivered by software (i.e. mobile/cell phone apps which deliver an intervention) or can involve real human interactions either in real time or asynchronously. The current study focuses on real-time, F2F interaction delivered by a trained practitioner, delivered through an online video platform (Skype). We refer to this as an online videoconferencing intervention.

Although online interventions in general have received good empirical support, there is little published data on the efficacy of online videoconferencing interventions specifically for harmful alcohol use and, to our knowledge, no published works specifically
exploring this mode for extended brief interventions (EBIs: structured courses of 4–6 sessions of 1–1, non-didactic, client-centred sessions, delivered by a specialist practitioner – see below and also Poikolainen (1999)). The current paper addresses this issue by comparing attendance and treatment outcomes from EBIs delivered either F2F or online.

The EBI approach evaluated (sometimes referred to as “brief lifestyle counselling” or “brief motivational interviewing”) was based on the UK implementation of the Drink-Less Brief Intervention programme (see Heather, Girvan, Kaner, & Cassidy, 2008). EBIs are recommended in national guidance as a means of filling the gap between services provided for people whose drinking behaviours present as high risk or dependant (who can access specialist alcohol treatment) and those at increasing risk (who can access brief advice [BA]). As such EBIs are recommended for those referred to as “higher risk” and in the literature are typically understood as people who score 16–19 on the Alcohol Use Disorders Identification Test (AUDIT, Saunders, Aasland, Babor, DeLaFuente, & Grant, 1993). The therapeutic foundations of EBI are drawn from motivational interviewing (MI) and health behaviour counselling (Miller & Rollnick, 1991), the core aim being to motivate the client to achieve their self-identified goal of reduction or cessation of alcohol use. Whilst this definition describes the vast majority of work on EBI, in that the intervention under analysis is derived from MI, it is noteworthy that there is an earlier form of the EBI work which drew from cognitive behavioural therapy which as Heather (2011) states could be coined “condensed cognitive behaviour therapy” (Heather, 2011, p2). The EBI approach is distinct from identification and BA as it is delivered by specialist practitioners and is typically delivered across several appointment-based sessions. Furthermore, following the MI tradition, it is regarded as being more refined than BA, non-didactic and client-centred and specifically avoids giving advice unless clients directly ask the practitioner to do so. As such, EBIs delivered at an alcohol service (i.e. F2F) are often included in the literature under the term “brief treatment” (Heather, 2011).

A typical EBI would be delivered when a client has requested further help with their alcohol use, and/or are ambivalent about behaviour change, and/or are at a higher risk (defined by having AUDIT score reflecting harmful use; see Babor, Higgins-Biddle, Saunders, & Monteiro, 2001; Pechey, 2011). Such an intervention would involve 4–6 sessions to assess the client’s motivation and confidence and to co-create a six-step plan. The plan aims to address their alcohol use by focusing on the costs and benefits of a client’s alcohol use and developing strategies for managing difficult/triggering situations. This six-step plan is reviewed in each session. EBI practitioners use the client’s current level of motivation and confidence to promote “change talk” and use the client’s own language to identify their own goals around reduction or cessation. Clients are supported to take responsibility for their own process by completing agreed “homework” tasks between sessions, such as noting their consumption and cravings by using paper and pen worksheets and/or smartphone apps.

In terms of F2F treatment, EBIs are delivered by a single practitioner in private consultation with the client, in the same geographical location (i.e. in a consultation room of a service centre). Existing evidence broadly suggests that such forms of EBI are effective, although no clear evidence suggests they are superior to other interventions such as IBA or BA (e.g. Kaner et al., 2007; Poikolainen, 1999). In contrast, online EBIs
involve the person delivering the treatment at one location (often a dedicated space) and the client at a location of their choice where they have access to a telemetry device (typically, a laptop/phone with video call capacity). In terms of online treatment (in general), there is an emerging body of work supporting the efficacy of web-based treatment and brief interventions for harmful alcohol use (e.g. Sinadinovic, Wennberg, Johansson, & Berman, 2014), to our knowledge no published work directly compares outcomes for online EBI as compared to F2F EBI for harmful drinking. Given the lack of research comparing F2F and online implementations of EBI, the current study aimed to utilise existing service evaluation data to directly compare these two modalities. Given the paucity of evidence and exploratory nature of this research, no directional hypotheses were made.

Method

Participants

Data from 82 clients who began EBI treatment between 1 April 2015 and 30 April 2016 were included in the study. Data were not available pertaining to clients who, post referral and initial assessment (but prior to receiving the EBI), were transferred to more intensive treatment due to alcohol dependency. Such early referrals took place on the basis of clinical judgement of suitability to EBIs. Clients with missing data (i.e. a scale score) were excluded from the analysis in which that data were being used. All clients provided consent for their data to be used anonymously for service evaluation purposes.

Descriptions of interventions

The current study utilised data collected by a community alcohol treatment agency (the Haringey Advisory Group on Alcohol [HAGA]) as part of their normal service monitoring procedures to draw preliminary comparisons between online and F2F delivery of EBI. Specifically, the interventions at HAGA involved one to six 20–40 min MI sessions that focused on increasing individuals’ motivation and confidence, weighing the pros and cons of change, planning change strategies and reviewing progress. The EBI worksheet used at this service was based on the content and format in a large-scale randomised controlled trial (RCT) (Coulton et al., 2009). The F2F EBI sessions were delivered at the HAGA centre and local general practices. Online EBI sessions were delivered over Skype (an online video call platform) with clients who self-referred from a website (www.dontbottleitup.org.uk) or internal HAGA referrals. All alcohol services at HAGA were provided free at point of entry and throughout to self-referred adult clients who live or work in the London Borough of Haringey (these services are funded by the local authority).

The F2F and Skype EBIs were identical except for the mode of delivery (as specified above) and the practitioner (one per condition). Both interventions were identical in terms of content and process in that both practitioners had received the same F2F training and used the same manual, flow charts (or care pathways), screening tools and both attended the same supervision provided by in-house staff.
Measures

AUDIT
The AUDIT (Saunders et al., 1993) was used to measure problem drinking on entry to the service. This 10-item measure identifies four levels of risk (low, increasing, higher and dependent) with scores ranging from 0 to 40 (scores ≥6 for women and ≥8 for men indicating problematic use and scores of 20–40 indicating probable dependence on alcohol for both genders).

Outcome measures
Several outcome measures were drawn from the Treatment Outcome Profile questionnaire (Marsden et al., 2008), a standard outcome instrument used by all publicly funded UK addiction treatment organisations, completed by the clinician, using clients’ self-reported data. This included measures of psychological well-being, physical health and overall quality of life using single items, on scales of 0–20 (0 “poor” and 20 “good”). The number of days in work (in the past 28 days including paid work, volunteering/structured work placement and/or school or college attendance) and the number of drinking days (defined as the number of days which the participant has used alcohol or substances in the past four weeks in the past 28 days) were also recorded, alongside demographic information (age/gender). Treatment attendance was recorded by the clinician. All measures were verbally delivered by the clinician during the EBI sessions and participants’ responses recorded on paper forms before being transferred to electronic format.

Procedure
The data were collated by HAGA from their archives and passed to the data analysis team (blinded for review). The analysis (reported below) was undertaken independently of HAGA. The results were prepared for publication by the research team, including individuals employed by HAGA (see “Conflicts of interest”). The research was considered a service evaluation by London South Bank University and thus did not undergo ethical review. The use of the data for this publication was also approved by HAGA.

Results

Demographics
Clients referred to online sessions were significantly younger, reported significantly higher AUDIT scores and attended more sessions. There was no association between gender and intervention type, \( x^2 (1) = .89, p = .89 \). See Table 1 for relevant descriptive statistics and associated \( t \)-test results.

Treatment outcomes
Analysis of variances (ANOVAs) with time (pre- and post-intervention) as a within-participant factor and intervention (online vs. F2F) as a between-participant factor were conducted, along with relevant simple effects analysis comparing pre/post scores in each treatment modality if appropriate. A summary of these results is presented...
below, and descriptive statistics and full ANOVA results for all analyses are reported in Table 2. Participants who received no sessions were not included in the following analyses (as no change scores could be calculated).

**Psychological well-being**
Psychological well-being increased significantly from pre- \( M = 11.33, SD = 4.43 \) to post-intervention \( M = 14.29, SD = 3.97 \). Neither the main effect of intervention nor the resulting interaction term was significant.

**Physical well-being**
Physical well-being increased significantly from pre- \( M = 13.02, SD = 4.30 \) to post-intervention \( M = 14.87, SD = 3.94 \). Neither the main effect of intervention nor the resulting interaction term was significant.

**Quality of life**
Quality of life increased significantly from pre- \( M = 12.73, SD = 4.02 \) to post-intervention \( M = 14.96, SD = 4.30 \). Neither the main effect of intervention nor the resulting interaction term was significant.

**Days in work**
No pre–post differences were observed. However, there was a significant effect of time: clients in the online condition had a significantly greater overall number of days in work \( M = 15.65, SD = 8.20 \) than did F2F clients \( M = 10.15, SD = 9.87 \). No significant interaction effect was observed.

**Number of drinking days**
Number of drinking days decreased significantly from pre- \( M = 20.05, SD = 8.16 \) to post-intervention \( M = 12.77, SD = 8.56 \). Neither the main effect of intervention nor the resulting interaction term was significant.

**Secondary analysis**
Because age and AUDIT scores differed significantly between intervention conditions, we conducted the same analyses controlling for these factors. As can be seen in Table 3, patterns of results remained the same, with the exception of quality of life where a significant interaction between time and intervention was observed. Simple effects tests of this interaction showed an increase across time in the online condition \( p < .001 \), but the change in F2F

| Table 1. Demographic data from online and F2F intervention clients. |
|---------------------------------------------------------------|
| Demographic | Online | Mean (SD) | n | F2F | Mean (SD) | n | t (df) | p | CIs (95%) |
| Age (years) | 36.13 (8.01) | 32 | 46.24 (11.48) | 45 | 4.20 (75) | <.001 | 5.32, 14.93 |
| No. of sessions attended | 4.75 (5.04) | 36 | 2.89 (1.92) | 45 | 2.28 (79) | .025 | 0.24, 4.39 |
| AUDIT | 26.62 (6.53) | 37 | 23.18 (5.58) | 45 | 2.58 (80) | .012 | 0.78, 6.11 |
| Gender (M/F) | 20/17 | 37 | 25/20 | 45 | – | – | – |

Note: Within-test sample sizes (reflected in degrees of freedom) vary as a function of completeness of data (see “Participants” and footnote 1 for more information).
Table 2. Mean outcomes by intervention condition and time point (standard deviations in parentheses) and associated ANOVA statistics.

| Outcome variable          | Pre (SD)  | Post (SD) | Pre (SD)  | Post (SD) | dfs | F   | p    | η²   | F   | p    | η²   | F   | p    | η²   |
|---------------------------|-----------|-----------|-----------|-----------|-----|-----|------|------|-----|------|------|-----|------|------|
| Psychological well-being  | 9.95 (4.70) | 14.26 (3.12) | 12.06 (4.16) | 14.31 (4.39) | 1.53 | 27.04 | <.001 | .67  | 1.15 | .289 | .02  | 2.67 | .108 | .05  |
| Physical well-being       | 12.05 (3.75) | 14.68 (3.40) | 13.53 (4.53) | 14.97 (4.24) | 1.53 | 11.61 | <.001 | .18  | 0.77 | .385 | .01  | .985 | .326 | .02  |
| Quality of life            | 11.68 (3.58) | 15.11 (3.30) | 13.28 (4.17) | 14.89 (4.78) | 1.53 | 19.20 | <.001 | .27  | 0.45 | .507 | <.01 | 2.48 | .121 | .05  |
| Days in work               | 15.96 (8.00) | 15.77 (8.08) | 9.64 (10.04) | 10.67 (9.69) | 1.60 | 0.34  | .563 | <.01 | 6.48 | .013 | .10  | 0.72 | .399 | <.01 |
| Days drinking              | 19.10 (7.73) | 9.95 (7.42)  | 20.58 (8.45) | 14.33 (8.85) | 1.54 | 39.82 | <.001 | .42  | 2.23 | .141 | .04  | 1.41 | .240 | .03  |

Note: Within-test sample sizes (reflected in degrees of freedom) vary as a function of completeness of data (see “Participants” and footnote 1 for more information).
only bordered significance (p = .060). No difference between interventions was observed pre-intervention (p = .184) or post-intervention (p = .459). A trend towards an interaction, F (1,52) = 2.97, p = .091, ηp² = .05, was also observed in the number of drinking days. Whilst reductions in drinking days were observed in both conditions (ps <.001), this interaction suggests the decrease was greater in the online condition (mean difference = 10.21 days) than the F2F condition (mean difference = 5.66 days). Pre-intervention, there was no significant difference between intervention conditions (p = .12). Post-intervention, the difference between conditions was significant (p = .047).

**Relationship between number of sessions attended and outcomes**

To test the relationship between number of sessions and change in outcome variables, Pearson’s correlations were undertaken between number of sessions, and change in each outcome (calculated by subtracting pre-scores from post-scores). Changes scores were normally distributed, with the exception of a skew in the distribution of number of sessions attended (statistic = 2.95, std error = .281). There was a significant correlation between number of sessions and psychological well-being, with more sessions being linked to greater increases in well-being, r(n = 55) = .31, p = .022. There was a trend towards more sessions also being linked with fewer drinking days, r(n = 56) = -.23, p = .088. Given the skew of sessions attended, Spearman’s tests of associations were also undertaken.² The association between sessions and psychological well-being change became a trend (rho = .216, p = .113) and the relationship with drinking days became significant (rho = -.27, p =.048). Relationships between other variables included in this analysis can be seen in Table 4.

**Discussion**

Online interventions, including online videoconferencing interventions, are becoming increasingly common as an option for alcohol treatment (Garde et al., 2017). EBIs have been shown to be an effective treatment for those wishing to reduce their alcohol use. In line with many other interventions, EBIs are increasingly being delivered via online telemetry modes, in contrast to more traditional F2F sessions. However, little evidence
exists comparing the effectiveness of EBIs delivered using these two modalities. The aim of the current research was to begin to explore the efficacies of these two modes of delivery using existing service evaluation data. Our findings present initial evidence to suggest that, for EBIs, online delivery is not inferior to F2F delivery and may in fact be more beneficial (see below). As such, the current research builds upon the growing evidence base supporting the efficacy of online interventions both in general and for alcohol use specifically (e.g. Gainsbury & Blaszczynski, 2011; Khadjesari et al., 2011; Sinadinovic et al., 2014).

Overall the findings of this study were in line with previous observations suggesting that EBIs are effective in reducing alcohol use and improving quality of life. However, some interesting differences in client demographics, treatment attendance and outcomes were observed – we discuss each of these differences in the section that follows, along with their theoretical and practical implications for alcohol treatment.

When comparing the demographics of the participants using online videoconference and F2F delivery of the same EBI intervention, the findings demonstrated that the samples differed in age (a younger sample attending the online sessions) and score on the pre-treatment AUDIT (the online sample typically scoring higher, i.e. experiencing more alcohol related harms). Overall online clients had, on average, more days in work than F2F clients (when considering mean days in work across both pre- and post-measures combined). These findings suggest that online delivery of the intervention may be accessed more frequently by younger, higher risk clients, and those spending a greater proportion of their time in employment and/or training. Furthermore, broadly in line with other research into videoconferencing for mental health, results demonstrate that more appointments per client were attended in the online intervention. Finally, when baseline drinking severity and age were accounted for, the findings provide initial evidence that online EBI led to equal or greater increases in quality of life and reductions in self-reported drinking days (but these should be interpreted with caution given the observed differences between parametric and non-parametric findings). On the remaining demographics and outcome measures, online and F2F modes of delivery did not differ

These findings are noteworthy given the current lack of published work on the use of online videoconferencing interventions specifically for problematic alcohol use (cf. Garde et al., 2017) and, in particular, the delivery of alcohol EBIs in this way. In general, these findings are supportive of online EBIs, suggesting they engage clients well, and lead to outcomes similar to those experienced by F2F counterparts. The increased

Table 4. Correlations between number of sessions and change in outcome measures.

| (1) | (2) | (3) | (4) | (5) | (6) |
|-----|-----|-----|-----|-----|-----|
| (1) Number of sessions | − .31* [−.034, .55] | .21 [−.11, .42] | .22 [−.12, .45] | − .03 [−.29, .20] | − .22 [−.45, .01] |
| (2) Psychological well-being | − | .49** [.29, .68] | .57** [.39, .73] | <.01 [−.21, .22] | − .28* [−.50, −.02] |
| (3) Physical well-being | − | − | .52*** [.34, .67] | − .30* [−.56, .16] | − .19 [−.43, .06] |
| (4) Quality of life | − | − | − .04 [−.35, .25] | − .32* [−.49, −.15] |
| (5) Days in work | − | − | − | − .09 [−.18, .32] |
| (6) Days drinking | − | − | − | − | − |

Note: n = 55 in all correlations. Bootstrapped rs with n = 1000 samples reported.
* p < .05, ** p < .01, *** p < .001.
Upper and lower 95% confidence intervals are reported in square brackets.
number of treatment sessions is notable because, in the alcohol field, increased attendance is generally related to better longer-term outcomes (e.g. Dale et al., 2011). In the current study, more sessions were linked with improved psychological well-being and a trend towards fewer drinking days. When considering these relationships, it is important to note that the motivation and commitment required to attend online EBI sessions may not be the same level as that required to attend F2F treatment – with the former possibly presenting a lower effort requirement. To the extent that effort requirement may correlate with commitment to change, it is possible that the longer-term outcomes and number of sessions attended may not correlate in the same manner across modes of delivery. Specifically, attendance at online sessions may have a lower association with positive outcomes (our sample size preclude a meaningful test of this effect). Similarly, the mode of recruitment to each service (online screening tool vs. doctor/self-referral) may itself affect session engagement and outcomes. Qualitative research exploring the reasons for increased attendance to the online videoconferencing intervention would be useful to understand the underlying reasons behind this.

There are a number of limitations and constraints to the findings reported here. This sample is relatively small so caution should be taken when interpreting effects, particularly the absence of differences. Also, this sample comprised self-referred clients and no control group was present. As such, it is impossible to disentangle treatment effects from spontaneous remission.

The archival nature of this research also presents special limitations. Only a subset of data (treatment attendance and outcomes as listed above) was available to the research team, and questions around who applied to start the program, and the outcomes of people who dropped out of treatment could not be examined. The follow-up period in the available data is also short. As we were using archival data, some measures (i.e. days drinking) have a low level of granularity – for instance, clients may have experienced fewer drinking days, but increased their consumption on those days. Number of drinking days is by necessity related to the quantity x frequency formula often used to estimate consumption (cf., Poikolainen, Podkletnova, & Alho, 2002 for a discussion) and mortality from alcohol-related illness is linked to increases linearly with consumption frequency (Rehm, Room, & Taylor, 2008). However, frequency has been shown to be an independent predictor of other negative outcomes for only some populations (see Graham et al., 2011 for a detailed overview), and drinking intensity predicts alcohol-related mortality exponentially (Rehm et al., 2008). Thus, whilst number of days drinking may be a viable proxy for actual consumption and subsequent risk, caution should be taken in evaluating the clinical significance of this finding until additional research has been undertaken.

The treatment condition was confounded by key worker (different individuals delivered the online and F2F treatments), meaning practitioner effects cannot be disentangled from treatment-type effects (the online practitioner had more years of clinical experience), therefore future research must control for this. It is worth noting that such potential practitioner effects are often unavoidable even in purpose-designed RCT evaluations of psychosocial (as opposed to medicinal) interventions, when different treatment arms include practitioners who are trained in different methods (and, of course, may have different aptitudes). In the current study, practitioner effects may have been reduced by virtue of the fact that both practitioners received training from the same treatment centre in the methods used and delivered a standardised treatment package.
Other challenges presented by the archival nature of the work include the recording of outcome measures by the individuals delivering the treatments. Although the fidelity of the analysed data is likely to be high (this approach is standard UK practice in many healthcare settings for both service audit, performance monitoring and future commissioning decisions), it falls short of gold-standard RCT methodologies (where participants would be randomised to condition and an intention to treat approach adopted).

Finally, the current study did not explore why some forms of treatment (i.e. videoconference interventions) may appeal to different groups. Younger clients, for example, may be more familiar with video/webcam interactions, and also may have different attitudes towards online privacy than older clients. This point also highlights the importance of using appropriate platforms for online interventions (Skype, used in the study, is accepted in the UK for the current use, but is not currently Health Insurance Portability and Accountability compliant in terms of data security, so would not be suitable for US applications). Why online videoconference interventions are not attractive to some people (for instance, those preferring autonomous or asynchronous options, which may perhaps offer more flexibility and anonymity) is also of interest, as are the clinical implications of cost-per successful treatment (both in and of themselves, and in comparison to F2F and autonomous interventions such as phone apps).

Future research could expand upon the current research directly by adopting a RCT methodology, recruiting a larger sample size and utilising a control group. Such work would be justified by this initial exploratory research, which also serves as a basis for suitable power analysis to be undertaken. In summary, the current research tentatively suggests that EBIs delivered via videoconferencing online perform as well as those delivered F2F and may be linked to better treatment retention. Online EBI may also be more accessible to a distinct population of clients. However, larger scale, mixed method trials are needed to confirm these effects.

Notes

1. In total, 27 participants had one or more points of missing data. Also, 27 lacked baseline AUDIT and/or gender data, 22 lacked age data. Nineteen were missing pre-assessment baseline measures. One participant lacked post-drinking days data, and eight were missing post work days data. Missing case analysis was conducted by identifying all participants who had one or more missing data points on pre and post measures. Between-subject t-tests revealed no significant differences on AUDIT scores $t(80) = 1.76$, $p = .081$ or age, $t(75) = 0.98$, $p = .329$ for those coded as having missing data or not. Gender did not differ between those who had missing data or not $x^2(1) = 0.31$, $p = .58$. No differences in other pre/post measures were observed ($ps > .176$), although number of post-intervention drinking could not be meaningfully compared given the single missing case.

2. We retain and present both analyses because there is debate around the need for normality with samples >50, and also as bootstrapping is a recognised response to this problem – see e.g. Sainani (2012). This allows readers to interpret this analysis in line with their position on this point. We note the difference in significance patterns signals caution should be applied to interpreting these results.
Data provenance and contributions

These analyses were conducted on the basis of data collected and provided by HAGA, and not independently verified by other agencies. The analysis and results were produced by Wood, Frings and Albery, all affiliated with LSBU. Methodological information was provided by HAGA – with contributions from Mark Holmes, Angela Calcan, Ola Kolade and Dylan Kerr. All authors contributed to the preparation of the manuscript. We are also grateful to Laura Pechey for her insights around the definition and use of EBI.

Disclosure statement

Daniel Frings, Cassandra J. Hogan, Kerlin H. Jn-Pierre, Kerry V. Wood, Ian P. Albery have no conflicts of interest to declare. Mark Holmes was employed as HAGA Digital Health Coordinator during the data collection, analysis and write-up of this research.

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