**The effectiveness of an innovative intervention aimed at reducing binge drinking among young people: results from a pilot study**

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AIMS

To assess the effectiveness of a digital-story intervention (short videos made by young people) seeking to reduce the prevalence of young people's binge drinking in Caerphilly.

METHOD

A quasi-experimental design was adopted with three intervention sites and one control site providing the sample (mainly aged 14-15 years). Three rounds of self-completion questionnaires, completed prior (T1), immediately after (T2), and six months after the intervention (T3).

FINDINGS

A total of 1031 questionnaires completed across the three time-points. Two-factor ANOVAs revealed a positive effect on knowledge for the intervention sample. The intervention group results showed stable attitudes towards drinking at the three time-points whilst the control group showed increasing positive attitudes towards drunkenness over the same time period. Intentions towards drunkenness were higher in the control group than the intervention group at T2 (Control -T1 Mean = 3.37, T2 Mean = 3.90; intervention -T1 Mean = 3.26, T2 Mean = 3.29). Intervention participants got drunk on fewer occasions in the last

week (mean occasions last week = 1.57) compared to control participants (mean occasions last week = 2.00), with the difference approaching statistical significance (F = 1.90, p =.07).

CONCLUSIONS

Promoting negative attitudes towards drunkenness, alongside a greater sense of control and potential regret about drunkenness are likely to be important factors when considering how to change people's intentions to drink. The study shows the potential to reduce the frequency of drinking behaviour when intentions are changed, and provides recommendations for future interventions of this nature.

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INTRODUCTION

Young people's drinking has received a great deal of media attention recently. Media focus on the anti-social behaviour of young people, and the opinion that drinking in the UK is increasing and spiralling out of control, means that we are never very far away from a news story or political debate concerning the alcohol consumption of young people. Headlines such as 'Binge drinking costing billions' (BBC 2003), 'Too much drink puts 1,500 children a year in hospital' (The Times 2007) and 'Alcohol is more dangerous than ecstacy' (The Telegraph 2007) are far from isolated examples.

To assess these concerns, the UK is fortunate that it is able to draw reference from a number of nationally representative surveys. For example, an annual survey of 8,200 11 to 15 year old school pupils in England (NCSR/NFER 2007) provides some insights into the extent of alcohol use. Over the last 15 years these surveys report a relative stability in the proportion of school-aged people who drink alcohol 'at least weekly', hovering around 20-25% with no discernable trend (NCSR/NFER 2007). However, of greater relevance to this investigation, these surveys also show that the average weekly consumption of those who report drinking in the previous week has more than doubled from 5.3 units in 1990 to 11.4 units on 2006 (NCSR/NFER 2007). It could be argued that these

increasing levels of consumption, rather than being spread evenly throughout the course of a week, are indicative of 'binge[1]' or excessive drinking over the course of one or two occasions. More specific evidence of a style of binge drinking has been provided through longitudinal European surveys with the proportion of young people in the UK (aged 15-16) who drank five or more drinks on a single occasion over the last 30 days increasing from 22% in 1995 to 27% in 2004 (Hibell et al. 2004). From more regional data, using data from a survey of 9,833 15 to 16 year olds in North-West England, Hughes et al (2008) estimate that around 30% drink five or more drinks in one session at least weekly. Within the study site (Caerphilly, South Wales) there is further evidence of widespread binge drinking. A recent Communities that Care (CTC) survey (2005), derived from over 8,000 questionnaires completed by secondary school age pupils in Caerphilly County Borough, showed that 37% of 15-16 year olds reported binge drinking in the past four weeks (defined as 'drinking five or more drinks in one sitting'). To summarise, the surveys show that amongst those young people who drink alcohol, an increased number are likely to binge drink and get excessively drunk than of previous generations (Coleman & Cater 2003).

Concern about alcohol consumption is becoming increasingly prevalent, as illustrated by the publication of the first Alcohol Harm Reduction Strategy for

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[1] 'Binge' drinking is defined in a variety of ways and there is no agreed single definition (see McAlaney and McMahon 2007). To illustrate, the Department of Health and Home Office (2007) define it as 'drinking too much alcohol over a short period of time….typically drinking that leads to drunkenness' (p.3), whereas the Cabinet Office (2004) in the Alcohol Harm redaction Strategy for England define it as drinking 'above double the recommended daily guidelines on at least one occasion in the last week' (p.11). As noted in some of the reviewed surveys among young people, 'binge' drinking has been defined as 'drinking five or more drinks in one sitting'.

England (Cabinet Office 2004). In line with this growing concern research evidence connected to young people's binge drinking is gradually strengthening. Of particular significance, there have been a number of comprehensive studies in the UK exploring the motivations of young people to 'drink to get drunk' (for example, Coleman & Cater 2005, Engineer et al. 2003, Harnett et al. 2000, Harrington 2000, Hughes et al. 1997, Kloep et al. 2001, Matthews et al. 2006, Norman et al. 1998, Pavis et al. 1997). As an extension to these exploratory studies, further research has investigated young people's opinions of successful ways to reduce binge drinking (Cabinet Office 2004, Coleman & Cater 2007). Coleman & Cater's 2007 study, conducted in Caerphilly South Wales, was notable in that young people reported a desire to hear real-life stories from people who they could relate to, and also wanted interventions to be delivered in a culturally-specific and area-specific way (Coleman & Cater 2007, p.315). The value of involving young people to assess their views about addressing public health concerns has been widely recognised, with the essential argument being that young people understand the views, attitudes and beliefs of their peers more so than adults (Cohen & Emanuel 2000).

Building upon the evidence, the next key step is to develop and conduct methodologically sound evaluations of interventions that seek to reduce binge drinking amongst young people. So called 'Brief interventions', or those which aim to promote harm-reduction among people consuming excessive levels of alcohol without significant dependence, have shown to be effective in medical

settings (D'Onofrio & Degutis 2002, Moyer et al., 2002, Heather & Wallace 2002, Whitlock et al., 2004).  However, less is known about their effects when implemented in different settings (Waller et al., 2002, Babor et al., 2003) such as in schools or community venues frequented by young people.  The need for innovative community-based interventions in the UK is recognised as a priority in National Strategies (Cabinet Office 2004, The National Assembly for Wales 2000) and by numerous other significant studies (Babor et al. 2003, Coleman & Cater 2007, McIntosh et al. 2007, Waller et al. 2002).  Moreover, the, 'Next steps in the National Alcohol Strategy' (Department of Health & Home Office 2007) highlight the importance of delivering and evaluating interventions within priority groups of young people under the age of 18 (who drink alcohol) in addition to specifically targeting 'binge' drinkers.

In response to this, the study presented in this paper documents important findings from a pilot-intervention conducted in Caerphilly, South Wales.  The intervention uses up-to-date media technology and is set in a geographical area of relatively high socio-economic deprivation where binge drinking among young people may well exceed the national average (Communities That Care, CTC 2005).  The intervention also builds upon recommendations derived from young people in the local vicinity interviewed during a preceding study (Coleman & Cater 2007).

*The intervention*

The intervention consists of two distinct components delivered over the course of a single 45 minute session. The first part, typically taking 20 minutes, involves viewing four 'Digital Stories'. The Digital Stories are two to three minute long films created by young people. To create these, a young person develops a 400-500 word script about a topic they are interested in and then records themselves reading the script. This is then combined with photographs or still-images that the young person has created and which are used to bring the stories to life. The unique features of Digital Stories are that they use modern technology, present contemporary images in a culturally-specific manner (through local dialect, images and scenery, etc.), and ultimately they are expressions of young people's perceptions of their world and life that their peers can relate to. Digital Stories have been used widely in arts' projects and more recently to address social and health issues such as crime and drug use (see Breaking Barriers 2008). The four stories used in this intervention address the consequences of binge drinking, through feeling ill, getting into trouble with the police, being in prison, and being hospitalised after a near-fatal accident. Given the use of media and technology, these Digital Stories can be shown to large numbers of young people simultaneously.

The second part of the intervention is delivered in smaller groups (typically up to 30 young people) and involves a group discussion surrounding some of the issues raised. The group discussion explores young people's reactions to the

stories and their views and attitudes towards sensible and harmful drinking.  The

group discussion is highly interactive, for example, to express their attitudes,

young people are asked to move to different parts of the room according to how

much they agree or disagree with certain statements.  Significantly, alongside

exploring young people's views, the group discussion allows the facilitators to

impart crucial information as to what can be considered sensible or harmful

drinking.  The facilitators of the intervention are a combination of staff employed

in community-based settings (e.g. a PSHE school teacher) and externally

appointed staff such as Youth and Social Workers from the local community.


RESEARCH METHODS


*Aim*


The aim of the research was to assess the effectiveness of this media-based

intervention seeking to reduce the prevalence of young people's binge drinking in

Caerphilly.  The effectiveness is determined through recording changes in young

people's drinking behaviour as well as the socio-psychological predictors of this

behaviour, such as; knowledge, attitudes, peer-group and descriptive norms,

perceived control or capability of changing behaviour, and intentions towards

future drinking.  For more detail on these socio-psychological predictors in the

context of alcohol use see Conner and Norman (2005) and Cooke et al (2007).

*Participants*

To assess the effectiveness of the intervention, four community-based sites were approached and agreed to participate.  These consisted of two secondary schools and one youth group within Caerphilly County Borough who received the intervention, and one secondary school in neighbouring Gwent that acted as a control site (see later).  It is important to understand at the outset that these sites were purposively, rather than randomly selected to take part in the study and that two further secondary schools were approached but declined invitation to participate. All three intervention sites were within a six mile radius with the nearest site to the control site being 15 miles. This close proximity provides further confidence that the sample were likely to be similar in terms of their socio-economic status and rural/urban mix that characterises the area. The local geography of the area, with limited transport access to the control site also meant that the risk of contamination between samples was minimal.

Within the schools and youth group, three self-report questionnaires were used to assess the effectiveness of the intervention.  The first questionnaire was completed one-month prior to the intervention (T1), the second immediately after viewing the intervention (T2) and the third six months after the intervention (T3). The samples from each site were based on a 'take-all' approach - all those in attendance were invited to complete the questionnaires.  This involved all attendees in the youth club irrespective of age, however, within the schools this

was exclusively amongst Year 10 (aged 14-15) students for T1 and T2 who then progressed to Year 11 (aged 15-16) students at T3.  The focus on Year 10s for the intervention was based on the local survey data reporting that many were binge-drinking (CTC 2005), and the fact that they would remain in school over the course of the intervention (by progressing into Year 11) ensuring adequate numbers of the *same* students would complete all three questionnaires.

*Measures*

The questionnaires at the three time-points included a number of identical sections, allowing the impacts and effects of the intervention to be determined. All three questionnaires recorded standard socio-demographic data, experiences of drinking alcohol (including times drunk[2] in the previous week and month which were used as the main outcome measures), and possible predictors of alcohol use, such as indicators of knowledge, attitudes, peer norms, perceptions of control, regret and intentions.  The predictors were adapted from measures used in previous studies that assessed the likelihood of future alcohol consumption (e.g. Norman et al. 1998, Cooke et al. 2007). All items were closed questions. For example, knowledge was measured with items such as 'Drinking alcohol slows down you reactions' using 'True' or 'False' for answers, while attitudes were measured using items such as 'Getting drunk in the next month would be

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[2] Drunkenness was defined in the questionnaire as follows: "By drunk we mean that you may not have remembered what you've been doing, felt a bit dizzy may have been sick, or had a hangover, etc". This has been used successfully in previous research (Coleman and Cater 2005).

enjoyable' on a numerical scale from 1 (Strongly disagree) to 5 (Strongly agree).

These measures (a total of 38 response options) were used in all three

questionnaires, while later questionnaires added a further 20 possible response

options, including two open-ended questions about the views and memories of

the intervention. A copy of the questionnaires is available from the author (see

Coleman et al. 2008). All three questionnaires were pilot-tested among 30 young

people in South-East England (where the Research Centre of the authors was

based). The piloting resulted in two of the knowledge questions being rephrased

slightly and refinements to the question measuring the amount of alcohol

consumed on the last occasion of drinking. In relation to the amount consumed, it

was proposed to use an example of how participants could complete their

response. The piloting confirmed that the first questionnaire took around five

minutes, with subsequent questionnaires extending the completion time to up to

10 minutes.

*Procedures*

In order to isolate the effects of the intervention from potential extraneous

influences, a quasi-experimental research design was used.  Alongside the three

intervention sites, a third school acted as a control group and completed the

questionnaires at the same time-points.  The questionnaires were identical to the

intervention measures, but excluded those questions at T2 and T3 that related

directly to the intervention.  As the intervention was potentially committed for

delivery across the Caerphilly Borough County, it was not possible to randomly allocate young people to receive/not receive the intervention, as in a RCT design. Therefore, the control group was purposively recruited from a secondary school in neighbouring Gwent. Due to the geographical proximity, the control group was deemed as similar in terms of socio-demographic composition and rural/urban mix. Further evidence detailing comparisons between the control and intervention sites is presented in the results section.

Quantitative analysis was used to assess the intervention's impact upon behaviour and the socio-psychological predictors of this behaviour (attitudes, peer-influence, intentions, etc.). To complement the descriptive findings with more sophisticated inferential statistics, a key step was to match individuals' responses across the three time-points. The merging of individuals across these time-points, alongside the addition of the merged control group, enabled the influence of confounding variables to be minimised although clearly not to the extent that a RCT would be able to achieve. Prior to examining the effects of the intervention on the predictor variables a reliability analysis[3] was performed which resulted in a single score being provided for the combined attitudinal (0.94, 0.95 and 0.94 at T1, T2 and T3 respectively) and intention (0.74, 0.73 and 0.79) responses. Satisfactory reliability was not found for peer-group norms and perceived control which were thus analysed as separate measures.

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[3] The reliability scores (Cronbach alpha) of above 0.70 depict the suitable reliability for combining measures in this manner and derived from the entire sample (intervention and control groups).

The research centre's ethical policy was followed throughout the intervention. This policy covers issues including the protection of participants, informed consent, confidentiality and the use of information, feedback, disclosure, expenses and payment, and organisational matters. The research was also approved by the research centre's Trustees' Sub-Committee on Ethical Standards. Finally, all participating researchers had current and approved Criminal Records Bureau (CRB) checks.

RESULTS

*Sample profile*

In total, 1031 questionnaires were completed (424 at T1, 324 at T2 and 283 at T3). The following table shows this in more detail, and identifies the number of control questionnaires which were completed at the three time-points.

| Site | T1 | T2 | T3 |
|---|---|---|---|
| Intervention | 334 | 245 | 214 |
| Control | 89 | 79 | 69 |
| Total per round | 423 | 324 | 283 |

Table 1. Numbers of questionnaires completed (T1 = one month prior to the intervention, T2 = immediately after the intervention, T3 = six months after the intervention. The darker line indicates delivery of the intervention).

Analysis of the data showed that the sites were socio-demographically similar with over 95% of all young people reporting that they were, 'White British' and all living in a relatively socio-economically deprived and rural area in South Wales. Analysis of the postcode data from the questionnaires indicated that the vast majority of the participants were living within the local, relatively socio-economically deprived, area. As expected with a largely school-based sample, the age and gender profiles of the intervention and control groups were similar. Within the intervention group 49% were male (47% in the control) and the average age at T1 was 14.8 years in the intervention (14.7 years in the control). The similar demographic profile of the sites indicates the suitability of the control site for comparison with the intervention groups. The mean age of the entire sample was 14.7 years at T1 and 15.3 years at T3.

Similar to evidence from larger-scaled survey data, the T1 questionnaires recorded that the majority of young people from the entire sample had drunk alcohol on at least one occasion in their lifetime (between 90% and 95% across all sites). Around three-quarters of the entire sample had been drunk at least once in the six months prior to the delivery of T1 questionnaires. Young males and females reported a similar level of alcohol use for these two measures. In general, from the three-quarters of the sample who had been drunk in the last six months, the first round of questionnaires revealed that around one-fifth got drunk twice or more in the previous week, with a similar proportion being drunk five or

more times in the previous month.  Based on these findings, it is clear that at least a proportion of young people from this sample, both boys and girls, were drinking heavily on a regular basis.  This finding supports results from earlier survey work performed in this locale (CTC 2005).  It was noticeable from these questionnaires that although the reported frequency of drunkenness over the previous week was generally similar among boys and girls, boys tended to report greater levels of consumption than girls.

*Data handling and management*

As also noted in Table 1, there was a significant degree of drop-out in the number of participants completing questionnaires between T1, T2 and T3. Although a certain degree of drop-out is expected in any longitudinal study, this was compounded by the delivery of near identical questionnaires one month apart at T1 and T2.  Unfortunately some of the respondents were not fully aware that they were expected to fill in similar questionnaires at three time-points. Some students were confused and believed that as they had already completed the questionnaire there was no need to repeat the exercise (see Discussion for further reference to study improvements derived through this pilot experience). This drop-out resulted in only 11 individuals being tracked across all three time-points and 17 being matched between the T1 baseline and T3 follow-up. A sample this small was not sufficient to meet recommendations for performing tests (Cohen 1992). Therefore, it was decided to base the inferential analysis on

the 94 young people who could be matched between T1 and T2, and the 89

between T2 and T3. Although not being able to track individuals across all three

time-points was a limitation, it was slightly eased by the fact that behaviour

change following the intervention was only recorded at T3.  This was because

the timeframe of the two behavioural measures (times drunk in the last week and

last month) were essentially baseline figures when recorded at T1 (pre-

intervention) and T2 (immediately after the intervention, *whereby the last month*

*and last week applied to times prior to the intervention*). Therefore, the matching

of individuals between T1 and T2, and T2 to T3, were both used to assess

changes in the predictor variables pre and post intervention.  The matching

between T2 and T3 (89 participants) was used primarily to assess behavioural

changes after the intervention (with the numbers exceeding the 17 who were

matched between T1 and T3). However, although stating that behaviour at T2

could act as a baseline, this must be recognised as a baseline measure which

was actually recorded *after* the intervention. Although recording behaviour that

occurred prior to the intervention, the time of questionnaire completion increases

the threats to the internal validity of the study, particularly as completing the

intervention may have affected responses about previous behaviour. This is a

limitation of the study that could be countered by reducing the drop-out of

participants between all three time-points (see Discussion).

Critically, both of the merged groups (T1 and T2, and T2 and T3), comprised of

intervention and control participants, appeared to be representative of the wider

dataset.  In conducting independent group t-tests on the predictor variables

(knowledge, attitudes, subjective norms, etc.) between the matched and

remaining samples from the intervention and control groups, there were no

statistically significant differences. The only exception was in relation to

perceived control.  The merged sample who completed questionnaires at T2 and

T3 had significantly higher[4] perceived control scores compared to wider sample

of the intervention and control participants who completed the same measure at

T3 (T2 and T3 Mean score = 1.59, T3 only Mean score = 1.87; t = 2.10, p<.05).

These tests support the suggestion that, overall, participants who were merged

at T1 and T2, and at T2 to T3, were representative of the sample as a whole.

This is a particularly important point, and provides confidence about the

robustness of these tests and the ability to generalize the findings from the

matched sample to the entire sample of respondents.

With these caveats in mind, the results presented include a range of descriptive

statistics, and inferential statistics that were derived from the merged samples.

As briefly mentioned before, reliability analysis supported the derivation of a

single score for the three attitudinal and two intention responses.

*Impact of the intervention on predictor variables – Knowledge, attitudes, and*

*intentions*

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[4] This item was designed so that lower values indicate higher control.

Knowledge levels surrounding alcohol and its effects were generally high across

the sample (around 85-95% reporting correct answers across all sites and time-

points), thus making any changes in this owing to the intervention difficult to

detect.  The notable exception for the knowledge findings was the belief held by

around one half of the sample (between 44% and 58% across all time-points)

that 'getting drunk once a week was not harmful' (see Discussion).  However,

two-factor ANOVAs conducted on knowledge scores revealed that there had

been a positive effect on knowledge for the intervention sample which was not

reflected in the control group.  The analysis revealed a marginal interaction

between site (intervention versus control) and time ($F = 3.35$, $p = 0.07$).

Examination of the means for the groups shows that whilst knowledge increased

from T1 to T2 among intervention participants (T1 Mean = 7.71; T2 Mean =

8.15), there was a slight decrease in knowledge scores among the control

participants (T1 Mean = 7.80; T2 Mean = 7.53). This was significant for T1 to T2,

rather than from T2 to T3.

The analysis showed that the intervention had minimal impact on lessening

young people's positive attitudes towards drunkenness. However, a review of the

descriptive data reveals that the intervention may have been important in

preventing any rise in positive attitudes towards drinking that may be expected

with the advancing age of the intervention group (Table 2).  As an example,

intervention participants reported a smaller increase in scores for both attitude

items between T1 and T2 (see Table 2). For example 'Getting drunk *in the next*

*month* would be enjoyable' increased from 3.20 to 3.27 for intervention group compared an increase from 3.55 to 3.78 found in the control group (where higher scores indicate a more positive attitude to drunkenness). As with the knowledge findings, these effects were more evident between T1 and T2, with all sites reporting similar attitudinal scores at T3.

| Mean score for 'Getting drunk *in the next month* would be enjoyable' | T1 | T2 |
|---|---|---|
| Intervention | 3.20 | 3.27 |
| Control | 3.55 | 3.78 |
| Mean score for 'Getting drunk *in the next month* would be good' | | |
| Intervention | 3.02 | 3.13 |
| Control | 3.40 | 3.68 |

Table 2. Mean attitude scores between T1 and T2 (higher score = more positive attitude to alcohol).

The intervention's effects upon young people's intentions to get drunk were also more notable between T1 and T2. Intentions to get drunk were significantly higher for the total sample (comprising intervention and control participants) at T2 (F = 5.25, p<.05). However this effect was qualified by an interaction between site (intervention versus control sites) and time-point (F = 4.04, p<.05). Examination of the means shows that while control participants' intentions were

considerably higher at T2 (T1 Mean = 3.37; T2 Mean = 3.90), the intentions of the intervention participants remained similar at both time-points (T1 Mean = 3.26; T2 Mean = 3.29). This suggests that the intervention may not be reducing intentions, but sustaining them at a similar level. With an increased intention to get drunk observed in the control group, the intervention may be providing a 'preventative' effect similar to the attitude findings noted above.

The importance of the effect defined above is furthered given that intentions are considered to be one of the most important predictors of future behaviour (see Connor and Norman 2005). This suggestion was confirmed through regression analysis of the combined intervention and control group sample, which showed that intentions to get drunk were the only significant predictor of drunkenness in the last *month* (beta = .58, p<.01), meaning that people who planned to get drunk were more likely to do so. The effects of gender, social norms, perceived control, attitude and perceived regret were all non-significant.

Given the significance of young people's intentions, it is also important to note that the most important predictors of intentions, again derived from the regression of data from the combined intervention and control group sample, were attitudes (beta = .65, p<.001), perceived control (beta = .22, p<.01), and perceived regret (beta = .17, p<.07). Interestingly, the regression analysis found that intentions were not significant in predicting drunkenness over the previous *week* (rather than month). By contrast, a person's sense of control was the only

significant predictor, meaning that those who perceived they were capable of reducing drunkenness were less likely to get drunk over the previous week (beta = .41, p <.01). These regression data have no bearing on the difference between the intervention and control groups as they were analysed among the entire sample (since both groups provided data on predictors and behaviour), and their predictive properties were not found to be affected by the intervention.

*Impact of the intervention on behaviours*

The proportion of young people who did *not* report drunkenness over the previous week and previous month was fairly stable in the intervention group. This contrasts with a reduced number of control group participants reporting such sobriety over the three time-points.  These descriptive results are shown clearly in Table 3.  The contrast over the previous month is most noticeable, with an increase in the proportion of intervention participants *not* reporting drunkenness over this period (15.4% at T1 compared to 21.3% at T3) compared to a decreasing proportion of the control group (28.1% at T1 compared to 10.2% at T3).  The 'Previous week' results show a stable proportion of intervention participants at the three time-points (53-54%)compared to the dramatic reduction in control group participants who did not reported drunkenness (74.6% at T1 compared to 34.3% at T3).

| Previous week | T1 | T2 | T3 |
|---|---|---|---|
| Intervention | 53.3 | 54.1 | 52.7 |
| Control | 74.6 | 53.8 | 34.3 |
| Previous month | T1 | T2 | T3 |
| Intervention | 15.4 | 13.7 | 21.3 |
| Control | 28.1 | 12.9 | 10.2 |

Table 3. Respondents *not* reporting drunkenness over the previous week or month (%)[5]

Although the intervention group did not report dramatic changes in drinking behaviour, the stability or marginal increase in the proportion of young people who did *not* report drunkenness compared to the behaviour changes of the control group are encouraging.

Two factor ANOVAs (on the merged T2 and T3 sample) supported these findings. A two-factor ANOVA compared the impact of site (intervention versus control) and time (T2 versus T3) on frequency of drunkenness in the last *month*. There was no effect of site or time-point. However, the two factor ANOVAs found that the intervention participants got drunk on fewer occasions in the last *week* (mean occasions last week = 1.57) compared to control participants (mean occasions last week = 2.00), with the difference approaching significance ($F = 1.90$, $p = .07$). The regression analysis confirmed this finding, with site

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[5] Percentage derived from all those reporting drunkenness in the previous six months.

(intervention versus control) shown to be a marginally significant predictor of behaviour in the last week (beta = .22, p = .06), indicating that getting drunk in the last week was more common in the control group than the intervention group.

DISCUSSION

This paper presents findings which assess the effectiveness of a Digital Story-based community intervention seeking to reduce binge drinking among young people.  The intervention was piloted amongst a Year 10 cohort in two schools and one youth group.  A similar cohort in a nearby school provided a control group upon which to base comparisons of the effectiveness of the intervention.  These sites were located in Caerphilly County Borough in South Wales, an area reporting high levels of socio-economic deprivation and rural isolation in parts, and known to be binge drinking 'hot-spot' (CTC 2005, see Introduction).  Therefore, given the socio-economic climate of the locality, and widespread use of alcohol, the intervention received a stringent test of its effectiveness.

Over the course of approximately seven months, and through the completion of three rounds of questionnaires, the impacts of the intervention on predictors of drunkenness (such as attitudes and intention) and actual frequency of drunkenness within 'the last month' and 'last week' are examined.  Whilst it is reasonable to conclude that the effects of the intervention are not dramatic, there are some encouraging results.  For example, we know from national survey data

that the proportion of young people who drink alcohol increases with age. To illustrate, 29% of boy pupils aged 14 drank alcohol in the last week compared to 40% of those aged 15. Equivalent comparisons for girls are 30% for those aged 14 and 41% aged 15 (NCSR/NFER 2007). The intervention group sample in this investigation showed, however, a relative stability compared to the decreasing proportion from the control group *not* consuming alcohol between T1 and T3. Given findings from the national data, there is some basis to suggest, therefore, that the intervention may be preventing the increase in drinking frequency that was present among the control group. In similar fashion, the results indicate a further buffering or preventative effect for the intervention group, through stabilising attitudes and intentions towards alcohol consumption which may arguably increase through its more frequent use and exposure with advanced age.

Some of the more specific findings from this study warrant further discussion. Firstly, the comparable proportion of girls and boys reporting drunkenness in our sample concur with findings of larger surveys which report young women having equal or more numerous instances of binge drinking (Hibell et al. 2004). Likewise, the finding of higher consumption levels amongst boys relative to girls is matched by national survey data, with young men reporting slightly greater levels of consumption per session (NCSR/NFER 2007).

Secondly, it appears that the intervention was able to increase people's knowledge about the harmful effects of alcohol. Although knowledge levels were generally high across the sample, this finding is important since a base level of knowledge is recognised as an important prerequisite for behaviour change (Conner & Norman 2005). The noticeably lower knowledge in relation to the question 'getting drunk once a week was not harmful' was most interesting. This could be interpreted as a person answering that getting drunk once a week is, indeed, less harmful than getting drunk on more than one occasion. However, it could also be interpreted that the sample are reporting a belief that getting drunk on one occasion per week is acceptable in line with their perceived social norms, and also presents a safe level of drinking. The latter explanation certainly ties in with findings from research conducted previously in Caerphilly by Coleman and Cater (2007). This suggests that many young people believe both that binge drinking is not a problem and that they do not engage in binge drinking contrary to their reported levels of alcohol consumption. In the Coleman and Cater (2007) study, 'binge drinking' was believed to be more allied to drinking on a daily basis, whereas weekly episodes of getting drunk were seen as 'normal' behaviour for young people. This interpretation of getting drunk on a weekly basis being both normal and not harmful raises the importance of clarifying the definition of binge drinking, and also increasing awareness of how drinking to this extent can have both immediate and long-term consequences.

Thirdly, the findings from this study show that intention towards future drunkenness (over the following month) was the most significant predictor of this behaviour. Attitudes towards drunkenness, perceived control or capability of reducing drunkenness, and perceived regret towards drunkenness were significant influences upon the intention to drink in the future. Therefore, promoting more negative attitudes to drunkenness, alongside a greater sense of control and potential regret about drunkenness could be the best means of changing people's intentions towards getting drunk. Once intentions have been changed, the analyses show there is real potential to reduce the frequency of drinking behaviour. These are clear and significant messages for those working in the field. Working on these particular components through various alcohol-education interventions may be the most fruitful way of ultimately reducing young people's frequency of drinking.

Fourthly, although intentions were found to predict drunkenness over the previous month, the analyses also found that perceptions of control over getting drunk (specifically, how easy it is to avoid drinking) predicted drunkenness over the previous week. These results indicate that different processes may be important in combating binge-drinking in the short versus the long-term. In the short-term, it seems that perceptions of control are important, and that these may fluctuate from week-to-week, perhaps depending on other factors in the participants' lives (e.g., parties, exams). Working on ways to improve young people's perceived capability to reducing drinking, where no doubt peer influence

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will play a key role, is essential.  Providing young people with confidence, skills and effective ripostes to drinking pressure could be useful considerations for health promotion. Therefore, raising people's sense of control may be particularly effective in the short-term, whereas working on people's intentions (as described above) is required for longer-term benefits and reductions in drunkenness.

Fifthly, many of the outlined impacts on knowledge, attitudes and intentions were more significant between T1 and T2, compared to the T3 findings.  So, whilst there is a suggestion of an effect in terms of knowledge, attitudes and intentions, this effect may be largest at the time of the intervention and may not be sustained in the long-term.  However, it does raise the issue of whether a single and short event such as this Digital Story intervention can ever hope to achieve lasting attitudinal, intentional and behavioural change.  As such, a clear message from this study is that a single event such as this should be considered as only a component of a more comprehensive school-based programme for the outcomes to be sustained.

To place these findings and concluding points into context, it is important to acknowledge some of the limitations of the study.  These also serve to support those planning future interventions of this nature.  Undoubtedly the most striking limitation was the drop-out of participants between the three rounds of data collection (423 at T1, 324 at T2 and 283 at T3).  This meant that individuals could not be matched across all three time-points, and created problems with extensive

exploration of the data by intervention sites, gender or residence. Also, when an intervention is being delivered, there is always the possibility of data pollution, for example, when people who did not view the intervention complete the questionnaire, or where people view the intervention but are absent when further data collection is carried out. A sample reduction in any longitudinal design is somewhat inevitable however, in this study, there were issues connected to the administration of the data collection that played a significant role. The most noticeable lesson to learn from this investigation is that it is vital to convey to participants, perhaps in a group assembly, that there will be repeated rounds of data collection and that the questionnaires, although very similar, need to be completed on all occasions. Although this was stressed to gatekeepers, it is possible that the administration of questionnaires by individual tutors diluted the message. Conveying the purpose of the data collection to a Year group in a school would also allow opportunities to stress confidentiality and the value of participants' opinions - techniques that have been shown to be effective in school surveys (Testa & Coleman 2006).

Although meaningful analyses were conducted in this paper, particularly through the merger of individuals across two time-points, it is worth emphasising that a larger sample size would have increased the likelihood of more findings achieving statistical significance. More precisely, statistical tests like ANOVA and t-tests are tests of the relative difference between two (or more) groups. With these tests, there is an inverse relationship between sample size and

difference between the means for the two groups. So, the larger the sample, the smaller the difference between means you need for a statistically significant result. As an example, in comparing the means for drunkenness during the last week between intervention and control groups (1.57 and 2.00 – see Results) it appears that there is a fairly substantial difference and potentially statistically significant. However with the tests designed to be robust, the reduced sample size does not allow this significance to be confirmed. If the same means for intervention and control groups occurred with larger samples, and therefore more power, then it would be far more likely that the difference would become statistically significant (and beyond the reported figure of 0.7 in the Results). With this consideration, it could be argued that the findings from this study are conservative, and as such perhaps the full impacts of this intervention are underestimated. As a consequence, it is reasonable to conclude that this particular finding, illustrating that the intervention has a degree of ability to predict drunkenness over the previous week, is possibly the most significant outcome from this evaluation.

A further limitation of the intervention concerned its standardised implementation. Although the Digital Stories were the same, and the group discussion followed a prescribed schedule, the intervention was not administered by the same people, nor on the same date. Undoubtedly, those sites delivering the intervention learnt from the strengths and weaknesses of those programmes delivered previously. Also, the individual perspectives of the staff delivering the intervention were likely

to affect its delivery and message.  This was inevitable given that higher resources would be required to support a group of staff to deliver the intervention across all sites, or to extensively train those delivering the intervention.

In relation to the limitations, the importance of conveying the importance of the study to participants and site staff has already been mentioned. Additional learning generated from the study, to increase the feasibility (and possible effectiveness of the intervention), include earlier consultation with the sites to allow for planning and timetabling, the showing of more than the four Digital Stories, and showing stories that had a much more explicit reference to alcohol and its harms. Also, sharing with the participants how the stories were made, and that creators were able to make a story exactly how they wished, would be important to clarify that they were entirely truthful accounts. Further details of the intervention, the way it was delivered, and an assessment of its feasibility and subsequent recommendations for future delivery can be found elsewhere (Blinded).

Nonetheless, and as a final note, this investigation needs to be acknowledged as a valuable pilot study in an area where little previous research exists. With further refinements based on the findings from this study, future interventions and evaluations would be more likely to approach the required standards that are documented to indicate sufficient robustness in this domain (Oakley 1995, Foxcroft et al. 1997, Dicenso et al. and  Foxcroft et al. 2003). As illustrated

through these aforementioned methodological reviews, this pilot has contributed to our improved understanding of appropriate outcome measures that can be replicated (in terms of predictors and drunkenness frequency), and ways in which methodology can be improved in terms of response rates and the necessary requirement to assign a control group through random assignment. Also, recognising the cultural-specific nature of the study area (largely remote rural and socio-economically deprived) questions whether this intervention could be replicated in other settings. The dialect and geographically-specific nature of the Digital Stories suggests that necessary refinements to the intervention would be required. However, although the results may not show extensive effects, the evidence of important findings does warrant further study of the Digital Story approach within different geographical and cultural settings. With the experience highlighting ways in which the delivery of the intervention can be improved, there is cause for optimism that the interventions' effectiveness may be increased as a consequence. With confidence, therefore, it is concluded that the behavioural impacts which approached statistical significance in this study could be achieved from a refined Digital Story-based intervention study, particularly one that was able to retain a greater sample size throughout. In addition to this, and as a stand-alone finding, the observed increases in knowledge, the 'preventative effect' within the intervention group, and the importance of intentions and the factors that shape these intentions provide significant insights for practitioners and policymakers to consider when developing alcohol interventions.

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