

Research Article

Telephone Based Versus Face to Face Assist Linked Brief Intervention on Alcohol Use Cessation in a Nigerian Family Practice

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ABSTRACT

Objective: To compare the effectiveness of standard face-to-face Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) linked brief intervention (F-ASSIST) with mobile telephone-administered ASSIST linked brief intervention (T-ASSIST) for alcohol use cessation in a Nigerian clinical population.

Methods: Participants (787), 18 years and above were consecutively randomized into either a T-ASSIST or F-ASSIST brief Intervention. Participants in the F-ASSIST group received face-to-face brief Intervention (standard care) at baseline and at 3 months. Participants in the T-ASSIST group received face-to-face intervention at baseline and at 3 months but in addition received weekly mobile telephone-delivered short message service (SMS) aimed at encouraging abstinence during study period. Main outcome measures were significant reduction in mean ASSIST score and percentage abstinence at 6 months.

Analysis was carried out by Chi square statistics and analysis of covariance (ANCOVA) using SPSS (16.0).

Results: The ANCOVA was significant, $F(2,761) = 77.2$, $p < 0.001$. Post hoc tests showed the adjusted means of the three groups to be significantly different. The effect sizes for the mean differences were 0.836, 0.601 and 0.227 respectively. Highest proportion of abstainers at 6 months was in the T-ASSIST group $p < 0.001$. Binary regression analysis shows that respondents in the F-ASSIST group were significantly less likely to be abstainers compared with the telephone based intervention OR = 0.18, 95% CI (0.09-0.37).

Conclusion: A telephone-based programme offers superiority compared with a strict face to face alcohol cessation program because it enhances treatment adherence.

MeSH Headings/Keywords: Alcohol, Mortality, Alcohol consumption

Introduction

Unhealthy use of alcohol constitutes one of the gravest risk factors for disease and disability worldwide [1-3]. Problematic alcohol use contributes to about 3.9% of the global burden of disease [3]. Studies have shown that mortality risk rises as the use of alcohol increases [2]. In addition, mortality risk has been found to differ among those with alcohol dependence who continue to drink heavily compared with those who are abstinent and those who have cut down on their drinking [4]. However, despite the evidence that shows high prevalence of alcohol use disorders is associated high mortality, there is a huge treatment gap for alcohol use disorders more than any mental disorder and this is particularly more in developing countries [5].

Systematic reviews have reported that brief advice interventions that are delivered in various health care settings can reduce problematic alcohol use. Having found screening and brief intervention to be effective in addressing non-dependent unhealthy alcohol use within various hospital settings [6], it has been recommended in national practice guidelines in developed countries of the world [7], but despite this considerable evidence-base, this is seldom the case in sub-Saharan Africa from a review of literature. Specifically in Nigeria, there is a high unmet need for the treatment of those with alcohol and drug use disorders [8].

One promising method that could work in effective delivery of brief interventions for alcohol use in resource poor low income countries is mobile telephone text messaging. Mobile phone text messaging is popular among Africans. Specifically in Nigeria, about 75% of Nigerian adults have active mobile phones [9]. This ubiquitous growth of mobile phones in Nigeria provides important means of using mobile technologies to deliver and assist in health interventions including alcohol use problems [9]. Literature has documented the potential and usefulness of SMS to large proportion of the population for health promotion in a wide range of health conditions including diabetes [10], asthma [11], risky sex [12], chronic obstructive airway disease [13], HIV [14,15], and cigarette smoking [13]. In addition, some literature in Nigeria have highlighted that text message-based health promotions are feasible and acceptable [14].

However, it is noteworthy that despite the effectiveness of brief interventions on problem alcohol use in developed countries, their impact on public health has been severely limited because high proportions of at-risk individuals are reluctant to seek help [15], there is lack of health care resources as well as the reluctance of health care workers to undertake these interventions [16]. In addition, health practitioners who are significant in providing such interventions would rarely engage in them due to the fact that they lack requisite skills together with their fear of potential negative effects on relationships with

their patients [16]. Theoretically, in poor resource countries, text message-based alcohol interventions might reduce the need for training potentially reluctant health care workers to deliver alcohol interventions, provide uniform standard protocols, and reach large numbers of persons (who have limited access to hospital based health care services) and reach them in a cost-efficient way. This paradigm shift in low income countries can reach persons in their natural environment where they make decisions to drink and increase saliency. Therefore, there is a real need for a study to explore the effect of SMS intervention to reduce alcohol use in a resource limited setting such as Nigeria where intervention reach and retention in real time are major health challenges. This study is guided by emerging evidence that the text message-based health promotions in Nigeria are potentially scalable and cost-effective. Furthermore, if text message-based alcohol intervention is found effective in Nigeria, this will set the tone for more rigorous studies in similar settings in sub-Saharan Africa in order to replicate this finding, and will also allow for its widespread adoption in these similar settings as evidence-based time- and cost-saving strategy to manage problem alcohol use.

In this paper, we aimed to compare the effectiveness of telephone-based Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) linked brief intervention with strict face-to-face based brief intervention on alcohol use. We also examined the mediators of mobile intervention. We hypothesized that a greater proportion of participants in the intervention group than in control group would report prolonged abstinence (24 weeks) at follow-up.

Methods

Study area: The study took place at the New World Specialist Hospital, Ibadan, Nigeria, a primary health care provider in the Ibadan District. This study took January and September 2013.

Ethical considerations: Before the commencement of the study, written informed consent was obtained from each participant who had a mobile phone and the objectives of the study were duly explained to them. Ethical approval was obtained from the Ministry of Health, Oyo State, Nigeria in December 2012.

Study design: Participants were 21 years and above (N = 3,901). They were service users in the hospital during the study period for any health condition. The initial screening question was with a simple Yes or No question about current alcohol consumption. Out of 3,901, 787 endorsed yes to this one - item screening question. These participants were thereafter consecutively randomized by an independent statistician into either an F-ASSIST or a T-ASSIST group.

Study population: The study population included alcohol users who consume more than 14 units per day for women, and 21 units for men or more than 5 units per day at a sitting. All of them consented to be part of the study.

Randomization process: Seven hundred and eighty seven participants (N=787) were randomized and matched by age and gender into either an F-ASSIST group or a T-ASSIST group and were followed up and assessed at baseline, 3 months and at 6 months. Randomization was via an independent and remote computerized randomization.

Inclusion criteria:

1. Alcohol consumption of more than 14 units per day for women, 21 units for men or more than 5 units per day at a sitting,
2. Possession of a personal mobile phone.
3. Fluency in English language, English being the language of instruction during the study period.
4. Ability to read, write and operate a mobile phone.

Exclusion criteria:

1. Participants with severe general medical conditions capable of affecting the train of research protocol
2. Current use of any other psychoactive substance
3. Participants on any current intervention program
4. Non-consenting subjects.

Measures:

1. Sociodemographic characteristics
A questionnaire elicited sociodemographic characteristics of the respondents. The questionnaire contained items such as age, gender, marital status, years of education, dwelling area, religion and reason for seeking treatment.
2. The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)

The ASSIST was developed by the World Health Organization for screening for drugs and alcohol in high prevalence settings [17].

3. The ASSIST-linked brief intervention
4. The ASSIST-linked brief intervention is a short intervention lasting 3 to 15 minutes. The ASSIST was used to current alcohol consumption, and to generate a risk score ('lower', 'moderate' or 'high') [18]. The risk scores were used to give a feedback to the client. The risk scores and related health problems based on the level of risk were made available to the clients. The act of asking clients to view their scores based on their interest was used in initiating brief intervention to them.

Telephone Based Intervention (T-ASSIST): Participants in the T-ASSIST group received the face-to-face intervention (standard care) and were thereafter followed up with weekly mobile telephone delivered short message service (SMS) reinforcing the initial face-to-face intervention. They were re-assessed at 3 months, and a booster (face-to-face) intervention given followed up by the weekly mobile telephone text messages until 6 months when they were finally assessed.

Face To Face Intervention (F-ASSIST): After the initial baseline assessments, participants in the F-ASSIST group were given intervention. The second assessment was at 3 months, during this period, a booster (face-to-face) intervention was given. At 6 months, the final assessment was carried out.

The face-to-face group was the control group among whom the standard care was administered. Nevertheless, at 3 months, participants in this group were randomly assigned into two groups, control group A and B, by the alternate method. Participants in group A received another face-to-face intervention and a weekly telephone, SMS messages, reinforcing the contents of the brief intervention. On the other hand, participants in group B did not receive any weekly telephone SMS message.

Content of the face-to-face intervention: The type of intervention was based on their level of risk. For lower risk (score 0-10), general health advice was provided, for moderate risk (score 11-27), brief intervention and a take home booklet were given and for high risk (score 27+), brief intervention, take home booklet were given, in addition each of them were referred for specialist assessment and treatment.

Content of SMS message: The text messages were developed by alcohol treatment specialists (BA, VO), and were also partially adapted from educational material, 'Rethinking Drinking' [19]. These messages attempted to reflect the style of language used in motivational interviewing [20]. The construction of the SMS used elements of the Health Belief Model [21], the Information Motivation Behavior model [22] and the Theory of Reasoned Action and Planned Behavior [23], which included: information linking drinking behavior to consequences and health, intention formation, barrier identification, general encouragement, goal setting, self-monitoring, positive feedback on performance, and rolling with resistance. The text messages consequently were reflective of the following key determinants of drinking behavior: [1] intention to drink (i.e. Do you plan to drink this week or weekend?), [2] knowledge of health risks associated with drinking (i.e. Do you think there are health problems associated with drinking alcohol more than 11 bottles for men; more than 7 bottles for women in a week? [3]. Skills to reduce drinking and action planning to avoid a drinking episode (i.e. would you be willing to set a goal to drink less than 11 bottles per week men; 7 bottles; How can you can achieve this?) They receive either positive encouragement as well as strategies for protective drinking or encouragement to reflect on their decision based on their response.

We estimated, 1 bottle of beer as 2 units of alcohol, 1 bottle of palm wine or sorghum as 2 units, a bottle of small stout as 1 unit, 1 short of hard liquor as 1 unit, ½ pint of liquor or 1 full standard glass as 6 units. 1 glass of wine as containing a unit of alcohol, 1 bottle of wine as 6 units [24].

Urine toxicology: To validate abstinence, we carried out a random urine toxicological test for alcohol at 6 months on 10% of participants in both groups. The desire for toxicological screen on these 10% of the entire sample at 6 months was borne out of the possibility of a false positive self-report of alcohol abstinence.

Chronic general medical conditions: We also obtained by self-report, from each participant, the history of any chronic, general medical condition. Clinical evaluation of the respondent and reports from the treating physician were used to validate self-reports of chronic, general medical condition. An important criterion used to classify a disease under a chronic general medical condition, was that, it must have been on for 3 years. We set the threshold of 3 years for the general medications to exclude any acute health condition that may be unrelated to alcohol use.

Data management and quality control: Trained research assistants who at the time of the study were residents doctors in psychiatry were the research assistants. They had received 2 weeks training on the research protocol and have been involved in similar studies. Before, the commencement of the study, three days of debriefing and review of all protocols were carried out.

We ensured completeness of the data, thereafter, data were electronically stored with regular backups. Areas that were not clear to the research assistants were rectified during regular meetings throughout the study period.

Data analysis: At baseline, all the sociodemographic data the participants in the two groups were compared using Chi square statistics, the independent t-test was used to compare ASSIST score.

Associations between dual diagnosis, chronic general medical conditions and alcohol use abstinence at 6 months were explored using Chi square statistics and binary regression analysis.

Treatment effects: Baseline, 3 months and 6 months between-group comparisons of ASSIST scores were computed using independent t test and percentage abstinence at 6 months with Chi square statistic a period.

Analysis of co-variance (ANCOVA): In order to determine the effect of the intervention on reducing ASSIST scores of participants, the analysis of co-variance (ANCOVA) was used to analyse the Mean ASSIST scores at 6 months. We controlled for baseline mean ASSIST scores and were entered as a covariate.

In the model, the dependent variable was the ASSIST score at 6 months; the fixed factor was the group (F-ASSIST, F-ASSIST + telephone text message follow up starting from 3 months and the T-ASSIST group).

The effect size across the three groups was generated by the "test of between-subject effects" of the SPSS output from ANCOVA. For post hoc pairwise comparisons, effect size was calculated using the formula $X_1 - X_2/s$ (where X_1 is the mean post intervention score of the intervention group; X_2 is the mean post intervention score of the control group, and s is the pooled standard deviation of the two groups) (Figure 1).

Results

Three thousand, nine hundred and one participants were accessed for eligibility, 801 participants were initially found eligible, 13 had severe general medication and found unsuitable to follow research protocol, 1 declined just before commencement of randomization. Seven hundred and eighty seven participants were finally randomized into the F-ASSIST (N = 392) and the T-ASSIST (N = 395) groups respectively.

There were no significant demographic or clinical differences between the two groups at baseline (Table 1).

At baseline, there was a significant association between age of respondents and ASSIST score, $F = 5.6$, $p < 0.001$. Post-hoc tests shows that this difference was due to the mean score of respondents who were < 25 years of age, being lower than those between 25 and 34 years, 35-44 years, 45-54 years, 55-88 years and > 64 years, $p < 0.001$ respectively.

Also, men reported higher score, $p < 0.001$, Christians also reported higher score on the ASSIST, $p = 0.002$, so also were rural dwellers, $p < 0.001$ (Table 2).

We conducted a one-way analysis of covariance (ANCOVA) for this study. The dependent variable was ASSIST score at 6 months, the group the participants belonged to being the

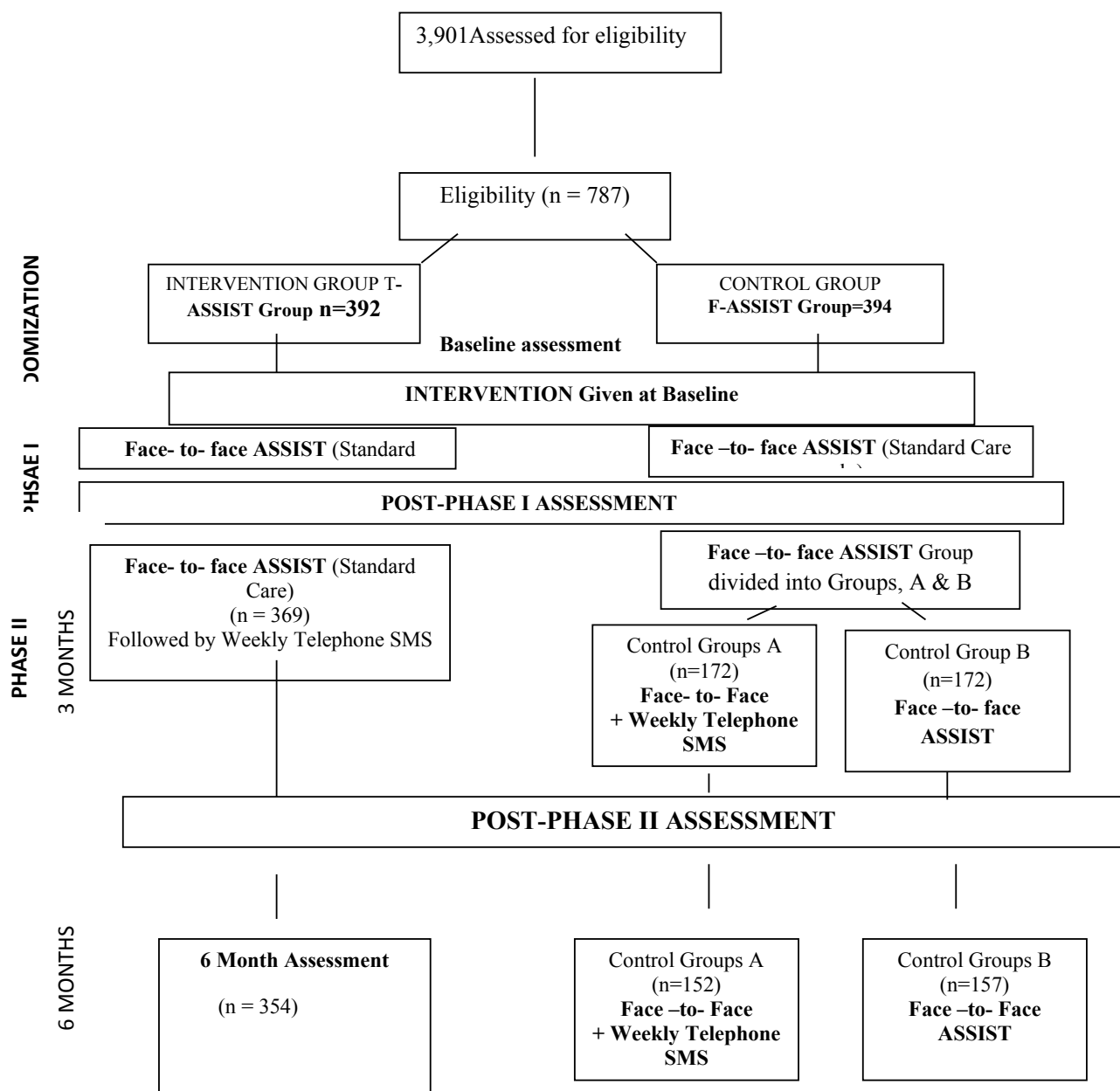


Figure 1: Consort flow diagram of participants throughout study stages.

independent variable. There were three groups: F-ASSIST intervention group, F-ASSIST + Telephone SMS at 3 months group and the T-ASSIST group. The covariate was ASSIST score at baseline, the ANCOVA was significant, $F(2, 761) = 77.2$, $p < 0.001$ (Table 3).

We conducted post-hoc tests to determine pairwise differences among the adjusted means for ASSIST scores at 6 months for the three groups. A Bonferroni correction was carried out to control for Type I error across the three pairwise comparisons ($\alpha = 0.05/3 = 0.017$).

The results showed the adjusted means of the “T-ASSIST group” was 16.16, “F-ASSIST group” 22.97, and the “F-ASSIST + Telephone at 3 months” 20.40. The adjusted means score of the “T-ASSIST group” was significantly lower than the “F-ASSIST”, $p < 0.001$; it was also significantly lower than the

mean of the “F-ASSIST + Telephone at 3 months group” $p < 0.001$. Nevertheless, the adjusted means of F-ASSIST group was not significantly different (after Bonferroni correction) from that of F-ASSIST + Telephone at 3 months group mean difference $p = 0.002$. The effect sizes for the mean differences were 0.836, 0.609 and 0.227 respectively (Table 4).

In line with our second objective, based on our univariate analysis, we found that age, $p < 0.001$, gender, $p = 0.002$, marital status, $p = 0.003$, residence, $p < 0.001$, religion, $p < 0.001$, cardiovascular disease $p = 0.03$, haematological diseases, $p = 0.03$, any chronic, general medical condition, $p = 0.01$ and intervention group, $p < 0.001$ were associated with abstinence at 6 months (Table 5).

However, the only predictor of abstinence was the intervention group, where the F-ASSIST group were significantly less likely

Table 1: Baseline demographics and psychiatric characteristics.

Demographic &	F-ASSIST Group	T-ASSIST Group	Statistics	P
Psychiatric Characteristics	n = 392	n = 395		
Age mean (SD)	45.77 (15.05)	46.28 (20.95)	0.4 ^t	0.7
Years of Education (SD)	7.60 (4.60)	7.11 (4.87)	1.5 ^t	0.1
Male n (%)	278 (70.9)	294 (74.4)	1.2 ^x	0.3
Married n (%)	298 (86.9)	306 (89.0)	0.7 ^x	0.4
Urban Dweller n (%)	194 (49.5)	191 (48.8)	0.1 ^x	0.8
Christianity n (%)	222 (56.6)	203 (51.4)	2.0 ^x	0.2
Islam n (%)	170 (43.7)	192 (48.6)	2.0 ^x	0.2
Any GMC n (%)	166 (42.3)	176(44.6)	0.3 ^x	0.6
Dual Diagnosis n (%)	53 (13.5)	45 (11.4)	0.6 ^x	0.4
Mean ASSIST Score (SD)	26.83 (6.67)	26.80 (6.50)	- 0.06	1.0

t: Independent t test; X: Chi Square

Table 2: Demographic association of all respondents with baseline ASSISTS score.

Demographic Characteristics	ASSIST		Statistics	P
	Mean	SD		
Age				
< 25	24.38	7.17	5.6	< 0.001
25-34	27.81	5.73		
35-44	26.83	6.19		
45-54	27.15	5.18		
55-64	26.88	8.14		
>64	27.52	7.05		
Gender				
Male	21.02	5.16	6.8	< 0.001
Female	18.58	7.95		
Marital Status				
Married	24.54	4.11	1.7	0.1
Unmarried	23.98	5.34		
Religion				
Christianity	22.44	6.08	3.06	0.002
Islam	21.01	7.09		
Education				
< 6 years	25.32	3.11	1.3	0.2
> 6 years	24.06	4.83		
Residence				
Urban	20.69	7.41	-4.7	< 0.001
Rural	22.88	5.47		
Any GMC*				
Yes	22.18	6.39	1.2	0.2
No	21.57	6.69		
Dual Diagnosis				
Yes	20.44	6.92	-1.3.	0.07
No	21.01	6.50		

F; ANOVA; t:Independent T test; *GMC: General Medical Condition

to be abstinent compared with the T-ASSIST group, OR = 0.18, 95% CI (0.09-0.37). This implies that the T-ASSIST group was $1/0.183 = 5.46$ times more likely to be abstinent compared with the F-ASSIST group (Table 6).

Discussion

This study to the best of our knowledge is the first randomized trial that used the ASSIST Linked Brief Intervention Program to address unhealthy alcohol use among a sample of Nigerians. In this study, we found that telephone-based brief intervention was an effective method of achieving abstinence from alcohol use. We also found the presence of certain self-reported chronic, general medical condition among persistent alcohol users at 6 months.

Demographic and medical correlates of alcohol-related harms: We found that at baseline, older respondents reported higher level of harm as reflected by the higher ASSIST score among them. Although, this finding is suggestive of the period in time it takes for alcohol-related health harm to develop, it is contrasting to reports indicating that drinking decline for those aged 26 and older, but increases for those aged 18 to 25 [25]. Although there is a growing body of literature on drinking and gender equality [26], we found a population that comprised of a preponderance of men; they also reported a higher ASSIST score at baseline. This is in support of reports showing that men generally drink more than women [27], and more likely to have alcohol-related harm [28]. The higher drinking rate in men may in part reflect the observation that men tend to become less intoxicated than women at an equivalent dose of alcohol [29].

The higher level of harm as reflected in the higher mean ASSIST score among the unmarried respondents at baseline is suggestive of higher prevalence of drinking in this group. Although, a decrease in prevalence of drinking has been reported during transition from a single conjugal status to being married, it has been argued that this may not be the case in divorce [30], thus, the influences of marriage on alcohol consumption are complex.

We found a higher index of alcohol-related health risk among rural dwellers. This suggests a higher drinking rate in them. This is in support previous work [31]. This may be because rural dwellers have limited access to information about alcohol and drug-related harm and health care services.

We also found a higher alcohol-related health risk among respondents with any chronic general medical conditions.

Table 3: Tests of between-subjects effects (Dependent Variable: ASSIST 6 Months).

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	42631.607(a)	9	5847.956	196.989	.000	.700
Intercept	312.886	1	312.886	10.540	.001	.014
Group	4581.822	2	2290.911	77.170	.000	.169
ASSISTalc0	28298.347	1	28298.347	953.233	.000	.556
Error	22591.576	761	46.687			
Total	350258.000	771				
Corrected Total	75223.183	770				

Table 4: Pairwise comparisons of adjusted mean ASSIST score at 6 months with associated effect size.

	Adjusted	T-ASSIST	F-ASSIST + Telephone at 3 months	F-ASSIST
T-ASSIST	16.49	-----	4.08 (0.609) ^{ES}	5.60 (0.836) ^{ES}
F-ASSIST + Telephone at 3 months	20.57		-----	1.52 (0.227) ^{ES}
F-ASSIST	22.09			-----

P < 0.017; ES in bracket

This supports the known association between chronic alcohol consumption and health hazards. Although moderate alcohol consumption may confer some health benefits [32] excessive alcohol consumption is known to be a leading risk factors for mortality and morbidity [1].

Correlates of drinking cessation: Results of our univariate analysis show that most of the correlates of drinking cessation at 6 months were essentially same as for the baseline. They were: age, gender, marital status, residence, religion, cardiovascular diseases, diabetes mellitus, any chronic general medical condition and telephone based ASSIST linked brief intervention.

According to the results, the age distribution of abstainers at 6 months was U shaped. This pattern may not be unconnected with the commonly reported J or U shape of morbidity and mortality associated with alcohol [33,34] and may suggest that their abstinence may be not be unconnected with alcohol-related morbidity. This is very relevant given the fact that participants in the current study are problem drinkers, seeking medical treatment for one or more disease conditions in the study facility. Specifically, our univariate analyses reveal an association between continued alcohol consumption at 6 months and cardiovascular diseases as well as with diabetes mellitus. Given, our sample as binge drinkers or excessive drinkers, our findings support the risk excessive drinking poses on cardiovascular health [35], and the increased risk of diabetes mellitus [36,37]. This by implication means that the health consequences of alcohol misuse persist after abstaining from its use suggesting the “deed has been done”.

The finding that fewer men were abstainers at 6 months is consistent with the well-documented reports of men generally drinking more than women [27]. The fewer proportion of abstainers at 6 months may be as a result of the notion that drinking is more common in unmarried people [38]. The lower proportion of rural dwellers, abstinent at 6 months is in support of higher rate of alcohol use in rural areas [39]. The

preponderance of Muslims as abstainers at 6 months, replicates documented evidence and could be adduced to the effects of religion [40]. We also found that respondents who received mobile telephone-assisted intervention were significantly more likely to be abstinent.

Effectiveness of the intervention: Our regression analysis shows that there were no demographic or clinical correlates of alcohol cessation at 6 months. This, by implication means that readiness to quit alcohol use at 6 months among this cohort of patients was not determined by their demographic and general health profile. This is a very useful epidemiological information and is relevant, noting that, alcohol and drug intervention programs are not generally available in most primary care centers in Nigeria, despite the high rate of medical morbidities associated with alcohol use.

Our results indicate the intervention carried out in the present study yielded large effect sizes. Given reports that psychosocial interventions that target behavioural change often do not yield large effect sizes, [41], mobile telephone delivered brief intervention is a very feasible way of reinforcing a positive behavioural change.

There is an increasing recognition of proven effect of the delivery of medical recommendations and prescriptions for patients’ behavioural changes in other medical settings, using mobile phones [42]. The current study has shown its potential in alcohol cessation setting within a family practice in Nigeria. This is very relevant considering the high rates of medical comorbidities among this population who may be consulting their general practitioners for medical concerns.

Our study showcases the potential of mobile telephone devices in the delivery of healthcare intervention among hazardous drinkers who are community dwellers. In another setting, the emergency department, mobile telephone technology has been found to effective for screening and delivery of

Table 5: Demographic and medical correlates of abstainers at 6 months (N = 663).

Age	Abstainers		Users		X ²	P
	N	%	n	%		
<25	23	20.3	90	87.4	12.6	< 0.001
25-34	5	8.9	51	91.1		
35-44	6	6.7	84	93.7		
45-54	3	6.7	42	93.7		
55-64	15	7.0	200	88.9		
>64	25	17.4	119	82.6		
Gender						
Male	49	9.4	470	90.6	10.0	0.002 ^{FE}
Female	28	19.4	116	80.6		
Marital Status						
Married	60	14.4	348	85.6	9.1	0.003
Unmarried	17	6.7	238	93.3		
Residence						
Urban	63	15.5	344	84.5	14.3	< 0.001
Rural	14	5.4	242	94.6		
Religion						
Christian	46	8.8	476	91.2	16.9	< 0.001
Islam	31	21.7	112	78.3		
Cardiovascular						
No	74	13.4	517	86.6	4.5	0.03 ^{FE}
Yes	3	4.2	69	95.8		
Hematological						
No	74	12.6	515	87.4	4.6	0.03 ^{FE}
Yes	3	4.1	71	95.9		
Dermatological						
No	133	18.6	544	88.6	0.4	0.5
Yes	11	19.3	42	85.7		
GIT						
No	65	11.6	494	88.4	0.01	0.1
Yes	12	11.5	92	88.5		
Diabetes Mellitus						
No	70	11.7	526	88.3	1.0	0.8
Yes	7	10.4	60	89.6		
CNS						
No	72	11.4	562	88.6	0.9	0.3
Yes	5	17.2	24	82.4		
Musculoskeletal						
No	75	11.6	573	88.4	0.04	0.8
Yes	2	13.3	13	86.7		
Malignancy						
No	75	11.5	575	88.5	0.2	0.7
Yes	2	15.4	11	84.6		
Respiratory						
No	51	11.3	399	88.7	0.1	0.7
Yes	26	12.2	187	87.8		
Ear/Nose/Throat						
No	75	12.0	552	88.0	1.4	0.2
Yes	2	5.6	34	94.4		
Ophthalmological						
No	72	11.7	546	88.3	0.012	0.9

Yes	5	11.1	40	88.9		
Psychiatric Disorder						
No	67	11.8	503	85.8	0.08	0.8
Yes	10	10.8	83	89.2		
Any GMC						
No	27	8.3	300	91.7	6.4	0.01
Yes	50	14.9	286	85.1		
Group						
T-ASSIST	57	16.1	297	83.9	16.2 (df2)	< 0.001
F-ASSIST + Telephone	13	8.6	139	91.4		
F-ASSIST	7	4.5	150	95.5		

Table 6: Predictors of abstinence in respondents (% Prediction 81.2%).

Variables	OR	95.0% C.I.		Sig.
		Lower	Upper	
Residence(1)	1.299	.879	1.921	.190
Religion(1)	1.628	0.93	2.561	.052
Any GMC(1)	.750	.501	1.121	.161
Marital Status (1)	.790	.497	1.256	.319
T-ASSIST	1			
F-ASSIST	.183	.087	.367	.000
F-ASSIST + Telephone	.457	.212	1.049	.047
CVSS(1)	.878	.465	1.265	.068
Haematology(1)	.600	.328	1.098	.098

brief intervention for binge drinking among adolescents in developed countries of the world [43,44]. Also among university undergraduates, Gajecki and colleagues similarly found mobile telephone technology useful in increasing the availability of brief intervention to problem drinkers [45]. Given, some, albeit very limited indications about the benefit of mobile telephone messaging interventions in long term illnesses such as hypertension and diabetes mellitus, longer prospective studies are required to determine the long term effectiveness of mobile telephone text message delivered brief intervention [46]. Our study demonstrates that behavior change interventions delivered by mobile phone text message which is now becoming increasingly common [47,48] is applicable in Nigeria. This supports the notion of that text message is a popular and preferred means of communication as it comprehensively accesses a target population groups [49], and also delivers an intervention without face-to-face contact. Its potential in addiction studies is huge, particularly in recruiting people who are reluctant to engage in direct contact [50]. The advantage is

that it is a cheap and friendly provider-patient communication method, given the serious dearth in number of mental health and de-addiction personnel in Nigeria. In addition, a resultant 16.1% alcohol cessation rate in a cohort whose primary reason for seeking medical consultation was not for problem drinking is promising.

In conclusion, mobile telephone-based brief intervention is more effective than routine face-to-face approach in reducing the level of alcohol related harms and achieving a meaningful alcohol cessation among problem drinkers.

The strength of the study is that it has demonstrated the feasibility of a cheap, affordable and available device, mobile telephone SMS in tackling an issue of immense public health significance in Nigeria, problem drinking. Our study has some limitations, the rates of the chronic, general medical conditions were by self-reports, thereby can be an underestimation, so also could the 3 year threshold of a general medical condition have created a selection bias of those with a health problem. This we tried to minimize by obtaining collateral information from the treating physicians. The possibility of contamination during the 6 months follow up period is also a great limitation. Also, our results may not be generalizable to other populations, given cultural and demographic differences in drinking rates and measures of drinking. This type of study is replicable in other parts of the world, given the global usage of mobile for communication. A qualitative research technique may also strengthen our results.

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