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CONTENTS

GENE-ENVIRONMENT INTERACTION AND INDIVIDUAL DIFFERENCES: IMPLICATIONS FOR CONTEMPORARY CLINICAL PSYCHOLOGY BENEDICT C.E. AGOHA, JUDE O. OGUIZU & ELIZABETH A. URIETO.	1
AFTER THE WHISKING: POST-TRAUMATIC STRESS REALITIES OF SOME KIDNAPPED PERSONS MFON E. INEME, HELEN O. OSINOWO, ANASTASIA O. AGUIYI	10
DEVELOPMENT OF THE HARMONY RESTORATION MEASUREMENT SCALE (COSMOGRAM): PART I PETER O. EBIGBO, CHIMEZIE L. ELEKWACHI, JOHN E. EZE, FELIX C. NWEZE, & CLARA U. INNOCENT	25
SCHIZOPHRENIC PROFILE ON THE AWARITEFE PSYCHOLOGICAL INDEX AFOLABI B. AROYEWUN, CAROLINE E. OFOVWE & ALFRED AWARITEFE	50
PREFERENCE FOR CONFLICT RESOLUTION STRATEGIES AMONG NIGERIAN UNIVERSITY WORKERS JOHN E. EZE, & REBECCA E. UZUEGBUNEM	56
SOCIAL SUPPORT IS RELEVANT IN INTERVENTION IN POSTPARTUM DEPRESSION: HERE IS THE EVIDENCE CHIINWE I. IFEACHO, AFOLABI B. AROYEWUN & AGATHA O. OGWO	70
MOTIVATIONAL COUNSELLING AND COGNITIVE BEHAVIOUR THERAPY COULD REDUCE NICOTINE DEPENDENCE RISK AMONG NIGERIAN ADOLESCENTS HENRY O. IMHONDE & BENJAMIN O. OLLEY	78
EXPOSURE TO VIOLENCE AND PSYCHOLOGICAL HEALTH AMONG RESIDENTS OF IBADAN GBOYEGA E. ABIKOYE	92

EXPLORING ISSUES IN THE MANAGEMENT OF
TRAUMA COUNSELLING NEEDS OF VICTIMS OF
ETHNO-RELIGIOUS VIOLENCE IN NIGERIA

MUSA A. TAFIDA AND OCHINYA O. OJIJI 101

TOWARDS A SANE NIGERIAN SOCIETY

PETER ONYEKWERE EBIGBO 107

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MOTIVATIONAL COUNSELLING AND COGNITIVE BEHAVIOUR THERAPY COULD REDUCE NICOTINE DEPENDENCE RISK AMONG NIGERIAN ADOLESCENTS

* HENRY O. IMHONDE, & BENJAMIN O. OLLEY,

ABSTRACT

Cigarette smoking is a serious problem worldwide with enormous psychological implications among adolescents. Despite risk of smoking, intervention strategies to address this problem are inadequate in Nigeria. This study was therefore designed to determine the relative efficacy of Cognitive-Behavioural Therapy (CBT) and Motivational Interviewing Supportive (MIS) counselling in reducing adolescents' nicotine dependence risk. Phase one of the study facilitated the documentation of code names, addresses, phone numbers, and school codes of all the participants. Participants who scored on the mean and above on the Nicotine Dependence Scale (NDS) in the first phase and expressed willingness to participate in the study were recruited for the intervention phase. Twenty-five participants (20 males and 5 females each) were assigned to three intervention conditions, CBT, MIS and Waiting List Control Group (WLCG). ANCOVA results showed that adolescents in the two intervention groups reported significant reduction in the number of cigarettes smoked than those on the WLCG: $F(2, 60) = 29.61, P < .05$. Follow-up assessment showed that while adolescents exposed to CBT reported significant reduction in the number of cigarettes smoked at one month evaluation ($P < .05$), such effect was no longer observed at the three-month evaluation. Conversely, while there was no significant reduction in the number of cigarettes smoked by adolescents exposed to MIS at one month, there was a significant reduction in the number of cigarettes smoked at three-month evaluation ($P < .05$). Adolescents who were nicotine dependent benefited from the two psychological based intervention strategies for risk reduction. It is therefore recommended that such intervention programs should be incorporated in the school curriculum.

Keywords: *Cognitive-Behavioural Therapy, Motivational Interviewing Supportive Counselling, Adolescents, Nicotine Dependence Risk Reduction.*

Introduction

Smoking rates among adolescents have risen over the past decade, with prevalence of cigarette smoking among high school students increasing from 27.5% in 1991 to 36.4% in 1997 (Center for Disease Control and Prevention, CDC, 1999). Global Youth Tobacco Survey Collaborative Group (2002) put cigarette use by youths in Nigeria (youths in secondary schools) as 23.9%. The increase in the prevalence of cigarette smoking among adolescents also

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exemplifies changes in the pattern of smoking. Despite the changes in the pattern of smoking among adolescents and dawning awareness of the threat of smoking, smoking still continued to be a formidable problem among adolescents. For example, Johnston, O'Malley, and Bachman (2000) found that among high school seniors, 23% report daily smoking, with 8.9% of seniors smoking more than 10 sticks of cigarette per day (Center for Disease Control and Prevention, 1999). Research suggests that nearly all-first use of tobacco occurs by the age of 18 (U.S. Department of Health and Human Services, U.S. DHHS, 1994).

Furthermore, children that begin smoking regularly at younger age are more likely to be nicotine dependent in adulthood (Stanton, Oei, & Silva, 1994). The National Drug Law Enforcement Agency [NDLEA] (1991) found that about 11 percent of the student population in Lagos abused cigarettes. Another study found that the male to female ratio for cigarette use in Kano is 11:1; and a comparative study of Kano and Lagos state on the extent and pattern of the use of psychoactive drugs among secondary school students found that unlike in Lagos State, where Valium topped the list and cigarette use came 3rd position, cigarette use topped the list in Kano State and was followed by Valium use (National Drug Law Enforcement Agency, 1992).

These findings which represents just a subset of the Nigerian population has led to the researchers looking for treatment paradigm that will be tailored to help the Nigerian adolescent smokers quit smoking or bring to the barest minimum the dependence on nicotine. These findings call for urgent attention as smoking is directly linked with diseases such as cardio-vascular disease (CVD), lung cancer, other tobacco related diseases, and possibly early death.

There is therefore need to prevent youth experimentation and smoking initiation; and what a better place to reach impressionable youth than the schools. School-based prevention programmes are popular and enjoy strong political support. The U.S. Center for Disease Control and Prevention Best Practices Guidelines for Tobacco Control (Center for Disease Control and Prevention, CDC, 1994) recommend school-based smoking prevention as one element of a comprehensive tobacco-control programme (Glantz & Mandel, 2005).

O'Leary (1985) reported that there are no recorded 50 percent successes in smoking cessation program. Evidence suggested that smoking cessation counselling treatments may have peaked in efficacy over the past 10-15 years (Shiffman, 1993). In fact, a more recent analysis suggests that multi-componential smoking cessation treatment have yielded declining abstinence rates over the last 15 years (Irvin & Brandon, 1999). It is possible that cessation treatment efficacy is declining either because treatment components (e.g. skill training) have been so widely disseminated that their effects have diminished because of repeated exposing or because the population of smokers now comprises more difficult to treat individuals, such as smokers with psychiatric co-morbidities (Hughes, 1996). The causes notwithstanding, smoking cessation treatments do not produce sustained abstinence in the majority of treated individuals. This therefore, calls for interest in new smoking treatment strategies

such as the motivational interviewing counselling and the cognitive behavioural therapy

The cognitive-behavioural coping skills treatment (CBT) is a short-term, focused approach to help tobacco dependent individuals. The underlying assumption is that learning processes play an important role in the development and continuation of tobacco use and independence. These same learning processes can be used to help individuals reduce their drug use. Very simply put, CBT attempts to help patients recognize, avoid, and cope. That is, recognize the situation in which they are most likely to use cigarette, avoid these situations when appropriate, and cope more effectively with a range of problems and problematic behaviours associated with substance abuse. CBT is collaborative. The patient and the therapist consider and decide together on the appropriate treatment goals, the type and timing of skills training, whether a significant other is brought into some of the sessions, the nature of outside practice tasks, and so on. Not only does this foster the development of a good working relationship and avoids an overly passive stance by the therapist, but it also assures that treatment will be most useful and relevant to the patient. While the cognitive-behavioural therapy has a definite structure that could easily be documented, the second strategy, motivational interviewing supportive group counselling (MIS), simply utilizes the social support, reward and punishment of the operant learning process.

This study thus examines the efficacy of cognitive-behavioural therapy and the motivational interviewing counselling in helping adolescent smokers reduce their nicotine dependence. Smith, Jorenby, Fiore, Anderson, Mielke, Beach, Piasecki, and Baker (2001) reported that there was no evidence that intensive step-up counselling treatment of either CBT or MIS actually benefited smokers, compared with participants receiving a brief intervention. However, considering the reported efficacy of CBT in literature, we hypothesized that adolescent participants who received cognitive behavioural intervention (CBT) would significantly report reduction in nicotine dependence than those who received the motivational interviewing supportive group counselling (MIS) and Waiting List Control Group (WLCG). Secondly, it was predicted that Participants in the cognitive behavioural group therapy post-tested one month after intervention would significantly report reduction in nicotine than when post-tested after three months of intervention. It was also postulated that participants post-tested after one and three months of intervention in cognitive behavioural group therapy would significantly report high nicotine reduction than those post tested one and three months in motivational interviewing supportive interviewing intervention. The researchers also looked at the effect of various factors (therapist support, group derived support and skill-training) that was most useful to participants in reducing nicotine dependence. Thus it was hypothesized that CBT participants would score a higher mean on the therapist support than MIS participants. Also it was predicted that MIS participants would report higher group derived support than those on the CBT group. Lastly, it was postulated that

CBT participants would have a higher mean on the skill-training factor than the MIS participants.

Methods

Phase One

Participants

A total of 356 adolescent smokers from 33 secondary schools (23 public schools and 10 private schools) recruited from among 2340 students initially surveyed from across secondary schools in Benin City participated in this phase of the study. These adolescent smokers had indicated to have either taken a puff of cigarette or are currently smoking. Two hundred and thirty five (65.8%) participants were males while 121 (34.2%) were females. Forty participants (11.2%) were aged 13 years, 76 (21.3%) were 14 years of age, 79 (22.1%) were 15 years of age, 63 (17.6%) were aged 16 years, while 99 (27.7%) were 17 years of age. The mean age of the participants was 15.29 years, with standard deviation (SD) of 1.37 years. On duration of smoking, 84 (23.6%) reported consistent smoking for between 1 week and 6 months, 114 (32.0%) had been consistently smoking for between 7 months to 1 year, 82 (23.0%) reported smoking for upward of 1-2 years, 67 (18.8%) had smoked 3-4 years, while 9 (2.5%) reported smoking for 5 years and above. One hundred and sixty-one participants (45.2%) reported smoking 2-5 sticks of cigarettes per day, 67 (18.8%) reported smoking 10-14 sticks per day, while 24 (6.7%) participants reported that they smoked 15 sticks and above a day. The mean number of sticks of cigarettes smoked per day across the participants was 6.84 (SD = 3.40).

On age at onset of smoking, 158 participants (44.3%) reported having their first cigarette at age 12; 99 (27.7%) smoked their first cigarette at age 13; 42 (11.8%) had their first cigarette when they were 14 years of age; 46 (12.9%) had their first cigarette at age 15; while 12 (3.4%) had their first cigarette at age 16. The mean age at onset of cigarette smoking among the participants was 13 years (SD = 1.33).

Measures

The instrument used in the first phase of the study was divided into two major sections: Section A elicits socio-demographic and smoking history while Section B contains the Nicotine Dependence Scale.

Demographic/Smoking History: This self-report part of the questionnaire elicits social demographic information about participants (e.g., gender, age, type of school, religion, ethnic group, and parents' socio-economic status) as well as smoking history, including duration of smoking, number of cigarettes smoked per day, age at onset of smoking, previous attempt at quitting, parenting status and alcohol use.

Nicotine Dependence Scale (NDS): This is a 15-item scale which measures the level of dependence on nicotine. Six of the items were adapted by the researchers from the Fagerstrom Test for Nicotine Dependence (FTND), which is a self-report measure of nicotine dependence (Fagerstrom, 1994). They include: How often after you wake up do you smoke your first cigarette? Do you find it difficult to refrain from smoking in places where it is forbidden? Which cigarette would you hate most to give up? How many cigarettes per day do you smoke? Do you smoke more frequently during the first hours after awakening than during the rest of the day? Do you smoke if you are so ill that you are in bed most of the day? There were other items which are culturally relevant and suit the purpose of this study. Examples include: Cigarette is like a close friend to me? The entire cigarettes I smoke taste good to me? I find it difficult to execute most tasks if I do not smoke. They were adapted from the Wisconsin Inventory of Smoking Dependence Motives, a 68-item scale developed by Welsch, Smith, Wetter, Jorenby, Fiore and Baker (1999). The original response format was modified to suit this study. The five-point strongly Agree (5) to strongly disagree (1) Likert-type response format was used for the study. The initial 25-items that formed the NDS was subjected to revalidation using 60 adolescent smokers comprising 50 males and 10 females from five private and five public schools in Benin City. Item analyses revealed 15 internally consistent items with coefficient alpha of .52. It was the 15 internally consistent items that then formed the NDS, which was used for the study.

Procedure

At the onset of the study, the researchers administered a one page questionnaire to elicit information on the demographics of the participants and their smoking history (such as age, sex, and have you ever tasted cigarette before, even a puff) to 2340 adolescent secondary school students in Benin City. Three hundred and fifty six (356) students from 23 public schools and 10 private schools who indicated to have puffed cigarette were then approached in confidence through a special code peculiar to each school and then given the Nicotine Dependence Scale (NDS) to fill. The questionnaire made provision for each school to have a code number, each respondent to have a code number, and phone numbers and home address were required. This was to help in identifying the participants and to easily reach the individual during the intervention stage. Participants were assured of the confidentiality of their responses to the questions. Two months was spent in the administration and collection of the copies of the questionnaire.

Phase Two

Participants

One hundred (100) participants whose scores were a standard deviation above the mean on the Nicotine Dependence Scale (NDS) consisting 80 males and 20 females from the first phase of the study and who reported willingness to

participate were initially contacted and invited to the intervention clinic. Twenty-five of the invited participants did not turn up on the appointed day, thus they were automatically eliminated. The 75 current adolescent smokers consisting of 60 (75%) males and 15 (25%) females who reported participated. They were randomly assigned to three conditions: two intervention groups comprising motivational interviewing supportive counselling group (MIS) and cognitive behavioural treatment group (CBT), and the waiting list control group (WLCG). Twenty-five participants (20 males and 5 females) were assigned to each condition.

Measures

The Smoking Treatment Questionnaire (STFQ) and the dependent measure, the Nicotine Dependence Scale already discussed in Phase One of this study, were used for Phase Two of the study. The STFQ is discussed below.

Smoking Treatment Factors Questionnaire (STFQ): Zelman, Brandon, Jorenby, and Baker (1992) developed the STFQ. The original 20-item questionnaire asked participants to rate the importance of various factors that helped them to quit smoking during treatment. During the re-validation, four items boarding on nicotine gum and nicotine patch were removed, thus leaving a 16-item scale. Each item is rated on a 7-point Likert scale from 1 (completely unimportant) to 7 (the most important), with particular sets of items averaged to yield three main scales: skills associated with reduction and support (further subdivided into therapist-and-group derived support) this scale was pre-tested among 60 adolescent smokers. A coefficient alpha of the entire scale was .78 while split half yielded .65. This was administered at the final counselling session.

Procedure

The first phase of the study facilitated the documentation of code names, school code, addresses and phone nos. of participants. This was to avoid the problem of losing contact. Participants who scored within the mean and above on the Nicotine Dependence Scale (NDS) and expressed willingness to participate in the study were invited to the intervention clinic.

During the first day visit to the clinic, all the participants were made to provide their names, phone numbers, e-mail address and home address. On this visit, participants were involved in a Focused Group Discussion (FGD), where factors responsible for the motivation of their smoking behaviour was identified and built into the treatment modules. After the FGD, participants were then randomized to one of three treatment conditions: waiting list control group (WLCG), cognitive-behavioural therapy group (CBT), and motivational interviewing supportive group counselling (MIS).

Participants in the waiting list control group only participated during the first session, but no additional counselling was provided thereafter. They were asked to return home and were informed when to come back for further

instructions. Participants in the other two groups received additional five group sessions (Saturdays only) during the five week following week one.

To make it easier for the therapist, those in the CBT had their clinic in the morning 9-10.30am for five Saturdays, while those in the MIS group had their clinic session by 11am-12.30noon. During the intervention programme 11 participants made up of 7 males and 4 females dropped out of the programme. Two were said to be ill and hospitalized, while the remaining stopped coming after the first two sessions with no reason and never returned again. The final participants were made up of 64 (53 males and 11 females). Additional follow-up and post assessment was made at 1 month and 3 months.

Results

Three hypotheses were stated to test the relative efficacy of the cognitive behavioural group counselling (CBT) and motivational interviewing supportive group counselling (MIS) intervention on reducing nicotine dependence among adolescent smokers. The effect of duration after the intervention was also assessed to evaluate the efficacy of the intervention. Furthermore, the contribution of therapist, group support and skill training was analysed to ascertain their effect on participants in reducing their nicotine dependence.

Results presented on Table 1 indicate that the intervention had a significant effect on nicotine reduction reported by adolescent participants $F(2, 60) = 29.61, P < .05$. The expectation that gender would co-vary with intervention was not statistically significant. Thus no difference existed between males and females in the treatment (CBT and MIS). That is, the reduction in nicotine dependence is the same for boys and girls.

Table 1: Analysis of Co-variance (ANCOVA) summary showing the efficacy of intervention on nicotine dependence among adolescent smokers

Source	SS	DF	MS	F	Sig.
Intercept	10773.08	1	10773.08	35.12	.00
Treatment	18163.52	2	9081.76	29.61	.00
Gender	1.47	1	1.47	.01	.95
Error	21779.30	60	306.75		
Total	150076.00	64			
Corrected Total	3994.32	63			

The mean difference between participants on cognitive behavioural intervention group and those on motivational supportive group was -1.04. The mean difference between CBT participants and WLCG was -33.52 and this was significant at .05. There was also a significant difference between the mean of MIS and WLCG (-32.48). This was also significant at .05. The result indicates that the reduction in nicotine among participants was as a result of the intervention (CBT and MIS).

Table 2: mean and standard deviation of treatment groups

Treatment	Gender	Mean	SD	N
CBT	Males	30.10	22.33	15
	Females	13.60	8.44	3
	Total	26.80	21.26	18
MIS	Males	26.50	14.08	19
	Females	33.20	8.35	2
	Total	27.84	13.27	21
WLCG	Males	58.15	14.85	20
	Females	69.00	22.63	5
	Total	60.32	16.72	25
Total	Males	38.25	22.34	54
	Females	38.60	27.39	10
	Total	38.32	23.23	64

Note CBT = Cognitive Behavioural Intervention

MIS = Motivational Supportive Group Counselling

WLCG = Waiting list control group.

Table 3 indicates that a significant statistical difference exists between participants' post-tested one month and those post-tested three months. One month post-assessment had a mean of 22.92 and SD of 7.52, while three months post assessment had a mean of 28.96 and SD of 5.03 ($t = 7.82$, $df = 35$, $P < .05$). This shows that the one month duration (post assessment) is more important than the three-month in evaluating the impact of intervention on nicotine dependence reduction among adolescent participants in the cognitive behavioural intervention group.

Table 3: t-test for related measure, showing the mean difference of one and three month's duration posttest, on nicotine reduction among adolescent smokers in Cognitive behavioural intervention group

Group	N	Mean	SD	DF	t	Sig.(2-tailed)
1 month post assessment	18	22.92	7.52	35	7.82	.000
3 months post assessment	18	28.96	5.03			

Table 4 shows that participants in cognitive behavioural therapy (CBT) had higher reduction on nicotine dependence (mean = 17.80, SD = 8.20) than those on the motivational interviewing supportive intervention group (mean = 20.50, SD = 6.60) within one month of posttest: $t = 2.25$, $P < .05$. Conversely, the three months posttest results indicated that participants in the motivational interviewing supportive therapy (MIS) group reported significant reduction in

nicotine dependence (mean = 21.30, SD = 7.30) than participants in the CBT group (mean = 23.90, SD = 5.20): $t = 3.01$, $P < .05$.

These results showed that though the CBT group participants reported more nicotine reduction at the one month posttest than participants in the MIS group, the MIS group showed a high reduction in nicotine dependence at the three-month posttest than those who were exposed to CBT.

Table 4: Independent sample t-test showing mean differences between participants in the cognitive behavioural therapy (CBT) and motivational interviewing supportive intervention programs in one and three months respectively

Group	N	Mean	SD	DF	t	Sig. (2-tailed)
One month CBT	18	17.80	8.20			
MIS	21	20.50	6.60	37	2.25	.028
Three months CBT	18	23.90	5.20			
MIS	21	21.30	7.30	37	3.01	.000

The researchers also made an attempt to find out what factor was most useful to the participants in reducing nicotine dependence. The Smoking Treatment Factors Questionnaire (STFQ) provided a base for the assessment of the following components of the intervention: skill training, group support and therapist support. A series of independent sample t-test were therefore computed to ascertain the mean difference across the CBT and the MIS intervention groups.

Result presented in Table 5 indicated that CBT participants reported benefiting more from the therapist support than those on the MIS: $t = 3.30$, $df = 37$, $P < .05$. This indicates that the CBT participants saw the therapist's support as one of the cardinal points that assisted them during the treatment period.

Table 5: t-test on mean difference of CBT and MIS participants on Therapist's support

Variables	Groups	N	Mean	SD	DF	t	Sig. (2-tailed)	Mean Diff
Therapist support	CBT	18	78.88	15.46	37	3.30	.004	22.42
	MIS	21	56.45	13.29				

Result in Table 6 shows that participants in the MIS group reported benefiting more from group derived support than those in the CBT group: $t = 2.81$, $df = 37$, $P < .05$. This indicated that MIS participants believed that group derived support assisted them more during the treatment period in reducing their nicotine dependence than those in the CBT group.

Table 6: Independent sample t-test on mean difference of MIS and CBT participants on group derived support

Variables	Groups	N	Mean	SD	DF	t	Sig. (2-tailed)	Mean Diff
Group derived support	MIS	21	83.63	7.17	37	2.81	.015	18.05
	CBT	18	65.57	16.52				

Table 7 shows that adolescents who were exposed to CBT believed that the skill training was one of the factors which assisted them than those in the MIS group: $t = 3.10$, $df = 37$, $P < .05$.

Table 7: Independent sample t-test on mean difference of CBT and MIS participants on skill training factors

Variables	Groups	N	Mean	SD	DF	t	Sig. (2-tailed)	Mean Diff
Skill Training Factor	CBT	18	84.56	7.94	37	3.10	.008	20.06
	MIS	21	64.50	17.05				

Discussion

This study was designed to investigate the relative efficacy of the cognitive behavioural therapy and the Motivational interviewing supportive intervention in helping adolescent smokers in school in reducing their dependence on nicotine. To effectively utilize and maximize the variables involved, the study was carried out in two phase. The first phase of the study screened participants and also established the profiles of participants who were dependent on nicotine and those who were not, thus helping in discriminating between those who will participate in phase two of the study. The second phase of the study tested the efficacy of two intervention strategies namely the cognitive behavioural therapy (CBT) and the Motivational interview supportive counselling (MIS) on nicotine reduction among adolescent smokers in school.

This phase two was designed to test two basic types of hypotheses: effect of the two intervention groups (CBT and MIS) in reducing nicotine dependence and the effect of time (duration) of the MIS and CBT after intervention on nicotine reduction.

The first hypothesis, which states that adolescent participants who received the cognitive behavioural therapy (CBT) would report reduced dependence on nicotine than those who received the motivational interviewing supportive group counselling (MIS) and those on the waiting list control group (WLCG) was supported. This finding differs from Smith, Jorenby, Fiore, Anderson, Mielke, Beach, Piasecki, and Baker (2001) who in their study found

that there were no evidence that intensive step-up counselling treatment of either the CBT or the MIS offered actually benefited smokers, compared with participants receiving the brief intervention, neither at-risk smokers nor smokers who maintained abstinence during the first post-cessation week benefited across week 2-5 of the quit attempt. According to the authors, the absence of any beneficial effect of the step-up treatment is perhaps the most notable and disappointing outcome of their work. Possible reason adduced for their findings was that the treatments were closely modelled after treatments that have yielded positive effects. The possible reason for the significant differences between the present study and that of Smith et al. (2001) is that this present study specifically took into consideration in-school adolescent smokers, which was not in Smith et al. study. Another possible explanation is the cultural variation. Here in Nigeria, it is not morally right for a female to smoke, but in USA, the setting of their study, no social stigma is associated with female smoking. Thus participants freely expressed themselves without fear or favour. Lastly and closely associated with the second point is the fact that reports given were not biologically confirmed as the researchers rely solely on the reports given by the participants.

From the observed marginal means, the CBT treatment was statistically superior to the MIS treatment, while both CBT and MIS treatment were superior to the WLCG. This result however could not be said to have provided a stronger support for the hypothesis. This is because a true matching hypothesis would stratify smokers based on relapse risk status, and since the research was basically concerned about assistance in reduction of nicotine intake, adolescents were irrespective of risk status randomly assigned to one of three groups (CBT, MIS, and WLCG). However, there was a great difference between CBT and WLCG, MIS and WLCG, while there was no statistical significance difference between CBT and MIS. This result as obtained from the post hoc analysis signifies that the intervention, CBT and MIS, was responsible for the reduction in nicotine dependence reported by participants.

The second hypothesis which stated that participants in the CBT post-tested one month after intervention would significantly report higher reduction in nicotine dependence than when tested three months later was supported. This shows that during the intervention and few weeks after intervention, the treatment had a significant effect on the CBT participants than three months later. This is not surprising as smoking is a habit, which is easier to learn but very difficult to totally give up. It is easier for nicotine reduction or total cessation to take place while the intervention program is still on and the individual is still within a group, which encouraged and assisted him or her to give up the habit, than when the individual is not within the confine of the intervention program. The urge to smoke is again built up and the individual again re-united with his or her peer groups, which makes the habit easier to establish again. This supports the finding of O'Leary (1985), which found that there are no recorded 50 percent successes in smoking cessation program. This finding stems from the fact that duration of intervention plays important role in the smoking cessation paradigm,

as many who were found to have recorded success during intervention relapse after months of end of intervention.

The third hypothesis, which states that participants post-tested after one month and three months of intervention in cognitive behavioural therapy (CBT) would significantly report nicotine reduction than those post-tested one and three months in the behavioural interviewing supportive intervention (MIS) group was supported. The one-month posttest in the CBT and the MIS recorded that participants in CBT groups had a lower mean than the MIS, indicating a lower level of dependence on nicotine by participants in the CBT group than those on the MIS group. Similarly, three months posttest result showed that participants in the MIS group reported more reduction in nicotine dependence than those on the CBT group. This result is consistent with previous findings showing the influence of duration of MIS intervention on smoking cessation. Smith et al. (2001) found that at-risk and lapsing smokers derived greater benefit from a supportive-motivational treatment as predicted but only at 6-month following-up.

This findings could be adduced to the fact that during intervention, participants on the CBT learned as though they were being thought, and the programme seemed compulsory for them with lots of school settings similarity, so they learned what they were expected to learn and after the intervention, within one month duration, they were still low in their nicotine dependence, but as time increased the learning began to wear off and their nicotine dependence began to increase. On the other hand, the MIS participants learned in a do-it-yourself situation and conditions. Thus, they saw themselves as solely responsible for what they learn and as such at one month follow up they were still learning, while at three months they began to consolidate what they had learned. Hence, they were scoring high on nicotine dependence at one month and low in three months.

The efficacy and the successful implementation of the therapy were checked through the smoking treatment factors questionnaire (STFQ). The STFQ showed that participants in the CBT treatment group reported high therapist support as helping them to achieve reduction in nicotine dependence, compared with participants in the MIS treatment group. Likewise, MIS treatment group reported high group derived support than CBT treatment group participants. Also participants in the CBT treatment group reported skill acquisition compared with participants in the MIS treatment group.

Summary and Conclusion

The results obtained from this study showed that CBT and MIS intervention programme were helpful in reducing nicotine dependence among in-school adolescent participants. It was also found that although gender had no significant influence on nicotine dependence, when combined with the interventions a significant interactive effect was obtained. Females drastically reduced their nicotine intake as a result of the treatment than males.

The study also showed that duration plays a very significant role in the effectiveness of the intervention process. The results obtained showed that participants post-tested one month after intervention showed drastic reduction in nicotine dependence than when tested three months later. Again it was found that while participants who received the cognitive behavioural therapy reported reduction in nicotine dependence more at one month posttest assessment, those who received the motivational interviewing supportive counselling reported great reduction in nicotine dependence at three months duration than those on the CBT group. This shows that smoking is a serious problem, which needs to be talked about daily until the individuals involved truly give up the act of smoking. Thus an intensive intervention programme may need more than one year to achieve a desired result. The results also showed that among participants in the intervention programme the CBT participants reported that they were helped more by the skill acquisition and therapist support, while the MIS participants reported that they were helped by group derived support.

Limitation of study

One of the limitations that will continually trail smoking investigation in Nigeria is in getting females to participate. Out of a total of 356 participants screened in phase one of the study only 122 were females and this number was attained because all who agreed that they had taken at least a puff of cigarette were included in the sample and this does not actually account for those who were dependent on nicotine. Though in phase two of the study those who were dependent on nicotine were identified, the numbers were really few as we had only fifteen females who reported on the first day of clinic, which later reduced to 10 females.

One other limitation of this study is that data on nicotine dependence and reduction were based on self-reports. Since there were no biochemical verification of smoking status, such as expiratory breath CO, available to the researchers, it is possible that some of the participants may have reported what they felt the researcher wanted to hear.

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