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COMPARATIVE EVALUATION OF ARTIFICIAL INTELLIGENCE-BASED CONSULTATION, PERSONAL COUNSELING, AND USUAL CARE FOR TOBACCO CESSATION AND ORAL HEALTH OUTCOMES AMONG ADULT SMOKERS: A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

BACKGROUND. Tobacco is still the foremost preventable factor that contributes to both morbidity and mortality rates globally and is strongly linked to oral disorders such as periodontitis, gum inflammation, poor oral hygiene practices and oral mucosal lesions. The advent of digital approaches like artificial intelligence for smoking cessation can enhance the quitting process due to its customized, efficient, and accessible behavioral help. **OBJECTIVE.** This study aims to compare the impact of AI consultation, personal counseling, and verbal education in smoking cessation and oral health.

MATERIAL AND METHODS. A 6-month prospective randomized control trial was carried out on 138 adult smokers within the age range of 35-44 years old. The participants were divided equally into three groups (n=46 each): Group A (AI consultation), Group B (personal counseling), and Group C (usual care). The key outcome measure was biochemical confirmation of smoking cessation after 6 months through the measurement of exhaled carbon monoxide levels. Other measures included Simplified Oral Hygiene Index (OHI-S), Gingival Index (GI), Community Periodontal Index (CPI), tobacco-induced oral lesions, participation, and satisfaction. Statistical analysis included chi-square test and one-way ANOVA.

RESULTS. After 6 months, the highest quit rates were found to be among the AI consultation (58.7± 4.8) and the personal counseling (39.1± 4.2) groups, with no cessation among the verbal education. There were significant gains in the OHI-S and GI scores for both intervention groups compared to the control ($p<0.001$). Less intergroup variation occurred with regard to the CPI scores throughout the follow-up period. The greatest participant satisfaction scores occurred in the AI group.

CONCLUSIONS. In comparison to personal consultation and usual care, artificial intelligence was more effective in encouraging smoking cessation, engaging participants, and improving certain oral health parameters. Artificial intelligence may be employed successfully as an additional method for tobacco cessation programs in the future.

Keywords: *Artificial Intelligence, tobacco, chatbots, cessation, counselling*

INTRODUCTION

Tobacco smoking is still among the leading causes of death and disease that can be prevented. As per the WHO, smoking leads to millions of deaths each year and also significantly contributes to the burden of heart diseases, lung conditions, cancers, and metabolic ailments around the world (1). Although more information about the negative impact of tobacco smoking has emerged over time, its usage is prevalent among different communities, especially in developing nations where access to quit smoking services could be limited (2).

Other than the systemic implications, tobacco consumption has been shown to have various detrimental impacts on dental health. These include increased risks for periodontal disease, gingival inflammation, tooth discoloration, impaired wound healing, halitosis, cavities, and oral mucosa lesions like leukoplakia, nicotinic stomatitis, and tobacco pouch keratosis (3, 4). Tobacco smoking over time has also been linked with increased incidences of potentially malignant conditions in the mouth and squamous cell carcinoma of the mouth (4). In addition, smokers have been noted to exhibit poor oral hygiene habits and low attendance at preventive dental clinics (5).

There are multiple benefits for systemic and oral health in the process of smoking cessation. It was already proven that smoking cessation leads to lower levels of gingival inflammation, positive changes in periodontal indices, improved wound healing capacity, and reversal of some tobacco-related lesions (6,7). Despite this fact, the rates of relapse and sustained smoking abstinence are still high, thus, searching for effective tobacco cessation methods is one of the main priorities in modern healthcare (2).

The majority of traditional tobacco cessation programs, like personal counseling, behavioral modification, quit lines, and pharmacotherapy, are rather effective; however, they can be hampered by the lack of access, affordability, time constraints, and professional assistance (8).

There are also number of factors which might act as barriers for accessing conventional cessation programs in certain regions (9). In recent times, digital health advances have opened new vistas in tobacco dependence cessation therapy. An intervention using AI can enable personalized, real-time, scalable, and economical cessation via mobile apps and conversational interfaces. An AI intervention can help in assessing the behavior, tracking the cravings, sending tailored motivational reminders, analyzing any risks of relapse, and providing consistent behavioral reinforcement outside medical settings (10,11). This could potentially result in better engagement and greater success compared to traditional approaches (12).

Though there have been a number of research works that prove the effectiveness of AI intervention for smoking cessation therapy, it has not been studied whether these digital interventions can be more effective compared to the conventional methods of treatment and their impact on the oral health status of patients undergoing tobacco cessation. Previous researches related to the topic were mainly focused on evaluating the effectiveness of smoking cessation and very rarely did they study whether or not there were oral health benefits of cessation by different means (11,12). However, the current randomized clinical trial was undertaken to evaluate the effectiveness of AI intervention, personal consultation, and usual care on cessation outcomes and oral health status of smokers within six months of following up.

METHODOLOGY

Study design and setting. A parallel-arm randomized controlled trial was performed over a six-month period to assess the efficacy of artificial intelligence (AI) consultation, personal counseling, and usual care on smoking cessation and oral health status in adult smokers of Nalanda, Bihar.

Study questionnaire. The WHO Oral health survey Adult Performa 2013 was used for clinical assessment. A pre-validated 6-item questionnaire of Fagerstrom Nicotine Dependence was used to measure participants smoking status. Smokerlyzer was used to measure carbon monoxide levels and participants with above 6 ppm were recorded as smokers. For recording patient satisfaction National Centre for Smoking Cessation and Training (NCSCT) Stop Smoking Service Client Satisfaction Questionnaire was used (16-18). Data was collected using Likert scale.

Ethical approval. The protocol of the study was approved by the institutional review board before the trial commenced. Informed consent was obtained in writing from all the participants, informing them of the purpose, goals, and the voluntary nature of their participation. The confidentiality of the participants' data was ensured at all time.

Sample size. The determination of the sample size for the current randomized controlled trial was made through the use of G*Power statistical software according to three independent comparison groups, with medium effect size (f=0.30), 80% power, and alpha value of 0.05. In this regard, the minimal sample size needed was determined to be 126 individuals. To allow for attrition or loss to follow-up, an extra 15-20% of participants were added; thus, 150 participants would be initially recruited.

A total of 150 consenting adult smokers who fulfilled the eligibility criteria were included in the current trial. After conducting baseline assessment, these participants were randomly assigned to three different interventions: Group A (AI-assisted consultation), Group B (personal counseling), and Group C (usual care). At the end of the follow-up period of six months, there were 12 (8.0%) dropouts or exclusions from the study due to various factors, with only 138 participants left to participate in data analysis (46 participants per group in Figure 1). The causes of participant loss included relocation/migration outside the study area (n=4), non-compliance with scheduled follow-up visits (n=3), voluntary withdrawal of their participation following their initial inclusion (n=2), personal/family-related issues (n=2), and incomplete documentation of clinical and/or biochemical outcomes (n=1). The overall retention rate was found to be 92.0%, which was deemed satisfactory for a six-month behavioral intervention experiment. Only those who had undergone baseline assessment as well as follow-up evaluation became part of the final data analysis.

Inclusion criteria:

- Adults aged between 35 and 44 years
- Active smokers with a minimum daily consumption of 5 cigarettes/bidis for the last 1 year
- Intention to quit smoking (motivation score of six out of ten)
- Consent to participate and sign an informed consent form.

Exclusion criteria:

- Current enrolment in any formal tobacco cessation programme
- Taking any drug for quitting smoking in past three months
- Existence of any systemic disease
- Pregnant or lactating mothers.

Randomization and allocation concealment. Participants who met the criteria were randomized into three groups by computerized blocked randomization in the proportion of 1:1:1. Allocation concealment was achieved by sequentially numbered, opaque sealed envelopes created by an independent researcher who had nothing to do with participant recruitment and evaluation.

Blinding. Considering the behavioral aspect of intervention, participant blinding was impossible to achieve. Nonetheless, blinding of the examiner who would conduct oral health assessments and record outcomes was assured.

Intervention groups.

- Group A: Artificial Intelligence-Based Consultation- Participants of Group A had access to an AI-powered mobile app for assistance in quitting tobacco use. The AI mobile application used in this study was custom designed by the research team to provide tobacco cessation support and behavioral monitoring. The mobile app offered personalized quit plans, cravings monitoring, progress tracking, behavior coping skills, automatic reminders, motivation, and interactive guidance from a chatbot. Participants were required to engage with the mobile app every day during the six-month intervention period.
- Group B: Personal Counseling-Participants of Group B attended personal counseling sessions conducted by certified tobacco cessation counselors. The counseling sessions were informed by established behavioral models such as the 5As (Ask, Advise, Assess, Assist, and Arrange) and 5Rs (Relevance, Risks, Rewards, Roadblocks, and Repetition). The first counseling session lasted about 45 to 60 minutes, followed by one-hour follow-up sessions each month.
- Group C: Usual care – individuals assigned to Group C were given regular oral hygiene instructions, along with minimal information on the detrimental impacts of smoking. This comprised conventional clinical practice, without any formal behavior counseling or AI support.

Outcome measures. Tobacco cessation status after six months was the main outcome variable. Self-reported tobacco cessation status was corroborated by biochemical measurement, i.e, exhaled carbon monoxide breath test. The cutoff point used to identify tobacco cessation was $\leq$6 ppm carbon monoxide.

Secondary outcome variables included oral factors and behavior. Oral hygiene was assessed using the Oral Hygiene Index – Simplified (OHI-S). Gingival health was evaluated using the Gingival Index (GI). The periodontal state was determined using Community Periodontal Index (CPI) as per WHO classification system. Smoking-induced oral pathology such as leukoplakia and palatal lesion were documented through oral examination. The behavioral component was measured in terms of participation in all planned intervention steps. Satisfaction with interventions was assessed six months later using a 10-point Likert-type questionnaire.

Data collection procedure. The baseline data collected included demographics, smoking information, number of cigarettes smoked daily, smoking duration, pack-years smoked, motivation to quit smoking, CO level, and complete oral examination. At the follow-up stages of 6 months, these data were collected through standardized measures. Information

concerning smoking status, oral indices, participants' involvement, and satisfaction were gathered at follow-ups.

Examiner calibration. Prior to the experiment, the examiner was calibrated in relation to the oral health measurements. The intra-examiner reliability test was performed using a kappa value of ≥ 0.80.

Statistical analysis. All data gathered were entered in the Microsoft Excel spreadsheet and analyzed using the IBM SPSS Statistics software, version 25.0. For continuous data, mean ± standard deviation was used, while frequencies and percentages were presented for categorical data. One-way analysis of variance (ANOVA) with post hoc Tukey test was conducted for intergroup differences involving continuous data, while chi-square test was done for categorical data. Paired t-test was used to assess differences within the group at different time points. Relative Risk (RR) with 95% confidence interval was determined for smoking cessation. A p-value of ≤ 0.05 was set as significance level.

RESULTS

Demographic variables for each group were showed in Table 1. Variables such as age composition, gender, residency status, educational status, type of smoked product, smoking behavior, duration of smoking habit, prior quitting attempts, and degree of nicotine addiction were similar among the three groups. Majority of the subjects in each group were male and belonged to the age range of 40-44 years; they were residing in rural settings and had a moderate degree of nicotine dependence. Cigarettes were preferred over bidis, while moderate smoking frequency (11-20 cigarettes/bidis) prevailed among the participants.

Out of the 150 participants recruited initially, only 138 successfully followed up after six months and were analyzed (46 participants each group) in Table 2. There was no statistically significant difference among the three groups with respect to baseline demographics and smoking related variables ($p \geq 0.05$).

The primary tobacco cessation results are illustrated in Table 3 below. After 6 months 46 participants in each group stays with the study. The highest rate of biochemically verified abstinence was achieved by the participants of the AI consultation program (58.7%), with personal counseling being second (39.1± 4.2) and usual care last (6.5± 1.9). The difference between the three groups was statistically significant ($p \leq 0.001$). The relapse rate after quitting smoking was the lowest among the AI group (7.4%), followed by personal counseling (18.2± 3.4) and control (40.0± 5.2). There were considerable drops in CO levels in breath among both intervention programs, with the largest mean decrease among the AI participants.

In Table 4, there were significant improvements in oral hygiene and gum health in both intervention groups, whereas the control group did not show significant differences in CPI scores over a period of 6 month.

Table 5 shows better engagement and higher levels of satisfaction among participants assigned to the AI consultation group than personal counseling and usual care groups.

DISCUSSION

In the current study, the efficacy of consultations with artificial intelligence (AI), personal counseling, and conventional treatment approaches for tobacco smoking cessation along with oral health evaluation during a 6-month follow-up period was investigated. The main result obtained is that AI consultation led to the highest rates of biochemical cessation success (58.7± 4.8) than personal counseling (39.1± 4.2) and the control group (6.5± 1.9). Furthermore, patients who received consultations through AI had more patient engagement, greater satisfaction, and better oral health.

The higher quit rates seen in the AI intervention can be attributed to the recently published scientific literature that supports the use of technology in cessation. According to Bendotti et al., conversational AI tools were shown to be effective in increasing abstinence from smoking compared to control interventions (RR = 1.29; 95% CI: 1.13-1.46) (10). In another meta-analysis conducted by He et al., conversational agents and chatbots were found to be effective and acceptable means of achieving smoking cessation, especially with the inclusion of personalized behavioral feedback (11). This is also congruent with the results of this current study wherein the highest cessation rates were found in the AI intervention. The AI based intervention's greater performance may also be explained by its ability to provide ongoing, tailored and real-time behavioral support which is often difficult to achieve via conventional clinic-based counseling. Recent studies show that conversational agents and AI-assisted smoking cessation interventions improve user engagement, adherence, and abstinence outcomes by offering individualized behavioral feedback and on-demand support (11,14-16).

While AI consultation proved to be more effective, personal counseling was also successful in bringing positive changes in the participants. Those who attended counseling sessions managed to have an abstinence rate of 39.1± 4.2, an impressive rate compared to that of the group C. Indeed, this result is consistent with the findings reported by Hersi et al. in their review, who state that structured behavioral counseling has a huge impact on the rates of quitting (2).

Participant adherence was greatest in the AI condition (87.6± 8.2), then counseling (71.4± 11.6), and least in the verbal condition (39.2± 10.4). Adherence is linked to success in behavioral modification and long-term cessation. In a study by Bricker et al., chatbot-assisted cessation programs increased adherence and engagement due to immediate and on-demand assistance (12). The results also indicate that AI-based systems can address challenges faced in traditional counseling, such as time availability, transportation difficulties, and clinic access issues. The low attendance rate observed in the control group (38% of scheduled appointments completed) might have influenced treatment outcomes, as sustained engagement has been reported to be an important predictor of successful smoking cessation (11).

In terms of oral health status, the AI and MI interventions led to considerable improvement in the OHI-S and GI compared to the control group, especially for the AI intervention group. Smoking cessation can lead to less plaque formation, increased gingival blood flow, and decreased inflammatory load. Dixit et al. observed that tobacco cessation activities can lead to improved periodontal and gingival health status (6). These findings align with the current study's outcomes and indicate that tobacco cessation has a positive impact on oral health practices. At baseline, participants who had tobacco-related oral lesions were sent based on established clinical procedures. So, there may have been improvements in oral health parameters related to smoking cessation, but there was additional treatment during the observation period based on management procedures, and this should be part of the oral health outcomes (14).

There were no significant differences in the Community Periodontal Index (CPI) scores among the groups. It might be because of the short duration of observation as periodontal tissue repair may take more than six months to become evident (6). Hence, while improvement can occur quickly, the recovery from inflammation to healthy periodontium may take longer periods to evaluate. Healing from tobacco-induced oral lesions occurred in the groups that received treatment as well as in those who attained smoking cessation. According to Khanna et al., some lesions like leukoplakia and smoker's palate may heal upon cessation of smoking (7). Moreover, recent indication advocates that smoking cessation contributes completely to periodontal health outcomes by decreasing inflammatory burden and promoting tissue healing (15).

The strengths of this research include its design, biochemical confirmation of quitting smoking, blinded oral examination, and combined evaluation of behavior changes and oral status. On the other hand, the limitations of this research include small sample size, recruitment in only one geographical center, lack of participant blinding, and limited follow-up time. The

gender difference in the study population was significant, and this gap restricts the number of gender specific conclusions on the general smoking population, especially female tobacco users. Additional bias in the estimates was due to missed follow-up appointments and different attendance rates, which in turn may have created an attrition bias. Thus, future research should be carried out using multicentric studies, with a greater sample size and longer follow-ups for evaluating whether there is prevention of relapse and sustenance of oral health changes. In conclusion, this current study showed that AI intervention in tobacco cessation was more effective than personal advice and usual care in terms of quitting smoking and enhancing oral health parameters.

CONCLUSIONS

Given the constraints of this study, AI consultation revealed a significantly higher level of effectiveness in smoking cessation when compared to personal counseling and traditional treatment within a follow-up period of 6 months. Patients in the AI-assisted group achieved better results in terms of biochemical verification, higher participation, higher satisfaction, and more positive indicators of oral and gum health. Personal consultations also had positive results and were still more efficient than regular care. These results show that AI-based approaches for quitting tobacco consumption can potentially prove to be a valuable addition to traditional behavior therapy methods, especially in cases of lack of resources. Incorporating AI tools in the process of dental and general healthcare may thus result in not only better cessation programs but also improved oral health for participants. It is advisable to conduct larger multicenter studies and follow up for longer periods to evaluate their efficacy and clinical feasibility.

REFERENCES

1. World Health Organization. WHO report on the global tobacco epidemic. Geneva: WHO; 2023.
2. Hersi M, Beck A, Hamel C, Esmaeilisaraji L, Pussegoda K, Austin B,et al. Effectiveness of smoking cessation interventions among adults: An overview of systematic reviews. Syst Rev. 2024;13:179.
3. Almeida-da-Silva CLC, Dakafay HM, O'Brien K, Montierth D, Xiao N, Ojcius DM. Effects of electronic cigarette aerosol exposure on oral and systemic health. Biomed J. 2021;44(3):252-259.

4. Warnakulasuriya S. Oral potentially malignant disorders: A comprehensive review. Oral Oncol. 2020;102:104550.
5. Johnson GK, Guthmiller JM. The impact of cigarette smoking on periodontal disease and treatment outcomes. Periodontol 2000. 2007;44:178-194.
6. Dixit A, Dhanalakshmi P, Rameshchandra PT, Chachlani KS, Dithi C, Dash KC, et al. Effect of smoking cessation programs on periodontal disease progression. J Pharm Bioallied Sci. 2024;16(Suppl 1):771-773.
7. Khanna D, Shruti T, Tiwari M, Sharma P, Khan A, Ranjan S, et al. Prevalence of oral potentially malignant lesions, tobacco use, and effect of cessation strategies. BMC Oral Health. 2024;24:1292.
8. Fiore MC, Jaén CR, Baker TB, Bailey WC, Benowitz NL, Curryet SJ, et al. Treating tobacco use and dependence: Clinical practice guideline. Rockville: US DHHS; 2008.
9. West R. Tobacco smoking: Health impact, prevalence, correlates and interventions. Psychol Health. 2017;32(8):1018-1036.
10. Bendotti H, Lawler S, Chan GCK, Gartner C, Ireland D, Marshall HM, et al. Conversational artificial intelligence interventions to support smoking cessation: A systematic review and meta-analysis. Digit Health. 2023;9:1-15.
11. He L, Balaji D, Wiers RW, Antheunis ML, Krahmer E. Effectiveness and acceptability of conversational agents for smoking cessation: A systematic review and meta-analysis. Nicotine Tob Res. 2023;25(7):1241-1250.
12. Bricker JB, Sullivan B, Watson NL, Mull KE, Santiago-Torres M, Lavista Ferres JM. Chatbot-based digital intervention for smoking cessation: Randomized controlled trial. J Med Internet Res. 2024;26:e57318.
13. Benjamin N, Choubey V, Bhasin M, Sushma B, Choudhary A, Thomas PA. Analysis of tobacco cessation programs in dental settings. J Pharm Bioallied Sci. 2024;16(Suppl 4):3290-3292.
14. Lachance A, Da SMAR, Yameogo A, Plaisimond J, Naye F, Yousefi F, et al. Interactive Conversational Agents for Cigarette-Smoking and Vaping Cessation: A Mixed-Methods Systematic Review. Multimodal Technol Interact. 2024; 8(11):101.
15. Caggiano M, Gasparro R, D'Ambrosio F, Pisano M, Di Palo MP, Contaldo M. Smoking Cessation on Periodontal and Peri-Implant Health Status: A Systematic Review. Dent J (Basel). 2022;10(9):162.

16. World Health Organization. Oral health surveys: basic methods. 5th ed. Geneva: World Health Organization; 2013.
17. Heatherton TF, Kozlowski LT, Frecker RC, Fagerström KO. The Fagerström Test for Nicotine Dependence: a revision of the Fagerström Tolerance Questionnaire. Br J Addict. 1991;86(9):1119-27. doi: 10.1111/j.1360-0443.1991.tb01879.x
18. Papadakis S, McEwen A editors. NCSCT training standard: Learning outcomes for training stop smoking practitioners. 3rd ed., National Centre for Smoking Cessation and Training; 2018. https://www.ncsct.co.uk/publications/ncsct-training-standard

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Table 1. Demographic characteristics of the study participants

Variable	AI Consultation n (%)	Personal Counseling n (%)	Usual care n (%)	Total N (%)
Age group (years)				
35-39	18 (39.1)	17 (37.0)	16 (34.8)	51 (37.0)
40-44	28 (60.9)	29 (63.0)	30 (65.2)	87 (63.0)
Gender				
Male	42 (91.3)	43 (93.5)	41 (89.1)	126 (91.3)
Female	4 (8.7)	3 (6.5)	5 (10.9)	12 (8.7)
Residence				
Urban	19 (41.3)	18 (39.1)	17 (37.0)	54 (39.1)
Rural	27 (58.7)	28 (60.9)	29 (63.0)	84 (60.9)
Education level				
Primary or below	14 (30.4)	13 (28.3)	15 (32.6)	42 (30.4)
Secondary	21 (45.7)	22 (47.8)	20 (43.5)	63 (45.7)
Graduate and above	11 (23.9)	11 (23.9)	11 (23.9)	33 (23.9)
Type of smoked product				
Cigarette	28 (60.9)	27 (58.7)	29 (63.0)	84 (60.9)
Bidi	18 (39.1)	19 (41.3)	17 (37.0)	54 (39.1)
Daily smoking frequency				
5–10/day	11 (23.9)	12 (26.1)	10 (21.7)	33 (23.9)
11–20/day	24 (52.2)	23 (50.0)	25 (54.3)	72 (52.2)
>20/day	11 (23.9)	11 (23.9)	11 (23.9)	33 (23.9)
Duration of smoking				
<10 years	13 (28.3)	14 (30.4)	12 (26.1)	39 (28.3)
10–15 years	21 (45.7)	20 (43.5)	22 (47.8)	63 (45.7)
>15 years	12 (26.1)	12 (26.1)	12 (26.1)	36 (26.1)
Previous quit attempt				
Yes	17 (37.0)	18 (39.1)	16 (34.8)	51 (37.0)
No	29 (63.0)	28 (60.9)	30 (65.2)	87 (63.0)
Nicotine dependence level				
Low	12 (26.1)	11 (23.9)	13 (28.3)	36 (26.1)
Moderate	24 (52.2)	25 (54.3)	23 (50.0)	72 (52.2)
High	10 (21.7)	10 (21.7)	10 (21.7)	30 (21.7)
Family history of tobacco use				
Yes	25 (54.3)	24 (52.2)	26 (56.5)	75 (54.3)
No	21 (45.7)	22 (47.8)	20 (43.5)	63 (45.7)

Table 2. Baseline characteristics of participants according to study group

Variable	AI Consultation	Personal Counseling	Usual care	p-value
Mean age (years)	40.8 ± 7.6	41.5 ± 8.1	42.1 ± 7.9	0.712
Cigarettes/day	18.4 ± 3.2	17.9 ± 3.5	18.1 ± 3.4	0.768
Smoking duration	13.2 ± 5.4	12.8 ± 5.1	13.6 ± 5.7	0.823
Pack-years	20.1 ± 4.6	19.5 ± 4.8	20.3 ± 5.0	0.694
Motivation-to-quit	7.3 ± 0.8	7.2 ± 0.9	7.1 ± 0.8	0.642

Table 3. Primary outcome measures for tobacco cessation at 6-month follow-up

Primary Outcome Measure	AI Consultation (n=46)	Personal Counseling (n=46)	Usual care (n=46)	p-value
Confirmed abstinence, n (%)	58.7 ± 4.8	39.1 ± 4.2	6.5 ± 1.9	<0.001*
Relapse among initial quitters, (%)	7.4± 2.1	18.2± 3.4	40.0± 5.2	0.041*
Baseline exhaled CO (ppm), mean ± SD	13.2 ± 2.8	12.9 ± 3.0	13.1 ± 3.1	0.884
6-month exhaled CO (ppm), mean ± SD	2.0 ± 0.6	2.6 ± 0.8	10.9 ± 3.4	<0.001*
Mean CO reduction (ppm), mean ± SD	11.2 ± 2.7	10.3 ± 2.9	2.2 ± 1.8	<0.001*
Relative Risk of abstinence vs control (95% CI)	9.00 (2.93–27.67)	6.00 (1.91–18.81)	1.00	<0.001*

Table 4. Secondary outcome measures for tobacco cessation at 6-month follow-up

Secondary Outcome Measure	AI Consultation	Personal Counseling	Usual care	p-value
OHI-S	-0.42 ± 0.28	-0.34 ± 0.25	-0.03 ± 0.08	<0.001*
Gingival Index	-0.48 ± 0.30	0/4 (0.0)	-0.04 ± 0.09	<0.001*
CPI	-0.05 ± 0.10	-0.03 ± 0.09	-0.02 ± 0.06	0.214
Oral lesion resolution	-0.31 ± 0.22	-0.18 ± 0.16	-0.04 ± 0.07	0.041*

Table 5. Participant engagement and satisfaction at 6 months

Variable	AI Consultation	Personal Counseling	Usual care	p-value
Mean engagement	87.6 ± 8.2	71.4 ± 11.6	39.2 ± 10.4	<0.001*
Satisfaction score	8.5 ± 0.9	7.0 ± 1.2	4.1 ± 1.0	<0.001*

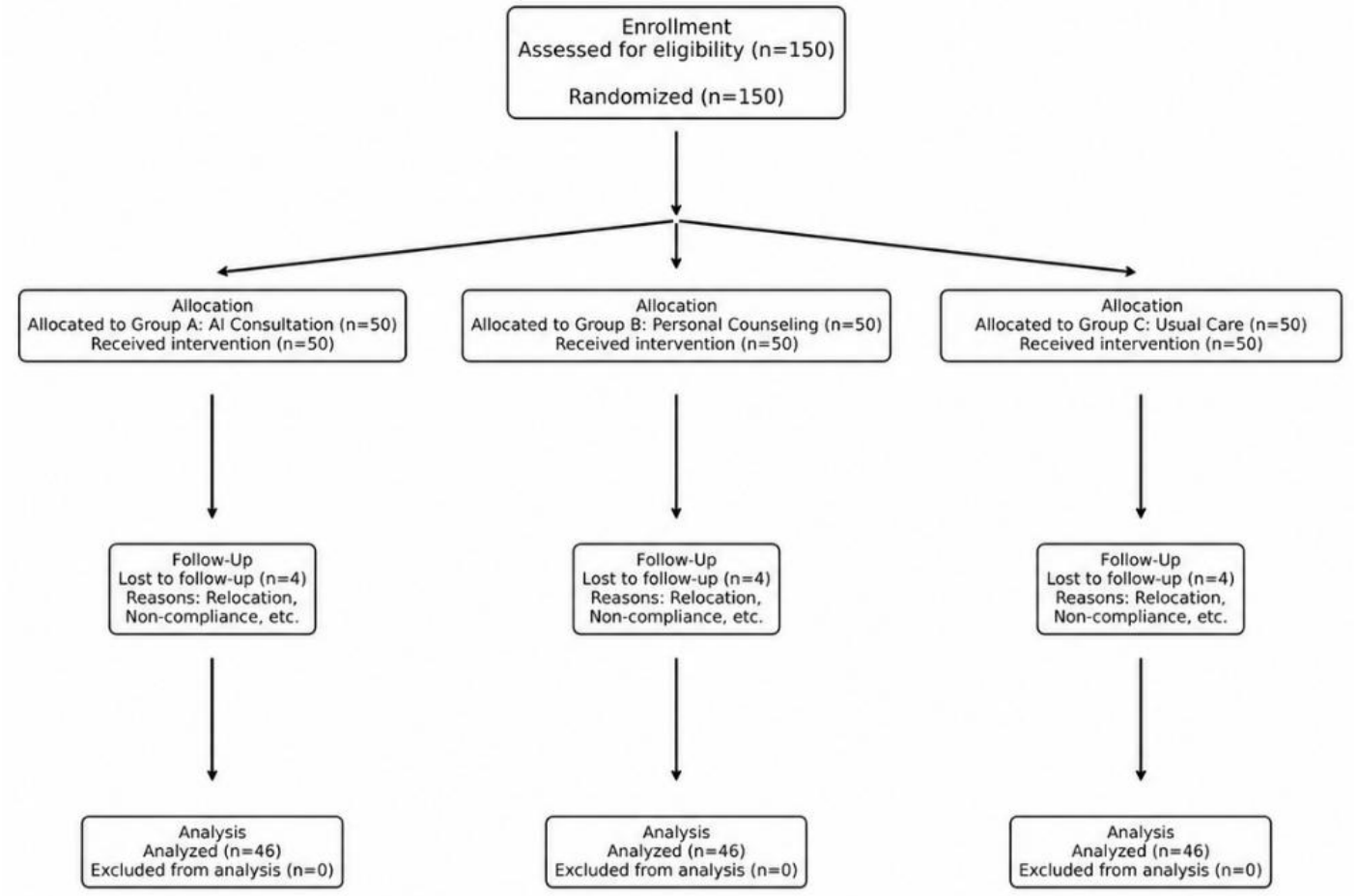

Figure 1. Consort flow chart for study design