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Research Article

Effect of Brief Intervention on Readiness to Change and Treatment Initiation in Patients with Hypertension using Tobacco

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Abstract

Introduction: Hypertension is a prevalent condition and tobacco usage is a known risk factor for its development. The brief intervention is a targeted and time-limited approach that aims to promote behavior change and improve health outcomes. The aim of the present study was to determine the effectiveness of Brief Interventions on readiness to change and treatment initiation in hypertensive patients who use tobacco.

Method: An experimental study was conducted on 80 adult patients with hypertension who were tobacco users and seeking treatment at the Department of Cardiology in a tertiary care hospital. Data was collected through structured and semi-structured questionnaires, i.e., socio-demographic and clinical variables, the ASSIST and a readiness to change questionnaire.

Result: The majority of patients were male, married, and living in urban areas. Tobacco use was prevalent among the patients, with 77.5% using smokeless tobacco. Before the interventions, the majority (87.5%) were in the contemplation phase, 10% were in the action phase, and only 2.5% were in the maintenance phase whereas after interventions the majority (80%) was still in the contemplation phase, 15% had progressed to the action phase, and only 5% were in the maintenance phase for readiness to change.

Conclusion: The present study revealed that the brief intervention proved effective in enhancing readiness for change in patients with hypertension using tobacco. The mean score post intervention (110.20) was higher than the pre-intervention score (97.41), indicating an increase in readiness for change after the brief intervention. There is a significant difference between before and after intervention with the t-value of 13.58 with 79 degrees of freedom & *p-value* of < 0.001, which was statistically significant at the .05 level.

Keywords: Tobacco usage, Brief intervention, Readiness to change, Treatment initiation, Hypertension, Readiness to change

Introduction

Tobacco is a drug that is legal but causes a great deal of death for its users. According to estimates from the World Health Organization (WHO), the tobacco pandemic kills over 8 million people year worldwide, making it one of the largest risks to public health that the world has ever faced. Of those deaths, almost 7 million are directly related to tobacco use, and over 1.3 million are caused by secondhand smoke exposure for nonsmokers (Hypertension, 2023). India is the second leading producer and consumer of tobacco. In India, only 1 in 10 rural residents and 1 in 5 urban residents have their blood pressure under control. Tobacco use across India is 42.5% for men and 14.2% for women. About 38.7% of adults in their homes in India are exposed to secondhand smoke (Promotion (US), 2010). According to WHO, Hypertension (HTN) is when the blood pressure in blood vessels is too high (140/90 mmHg or higher) (Hypertension, 2023). Persistently

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elevated blood pressure affects a significant proportion of the population worldwide. It is a modifiable hazard factor that makes a difference in the increase of hypertension. The presence of all the harmful chemicals in cigarette smoke leads to increased heart rate, vasoconstriction, arterial damage & reduced oxygen levels, all of which contribute to elevated blood pressure levels. Consequently, it is a major hazard calculated for heart failure, coronary artery disease, cardiovascular diseases & stroke (Roy et al., 2017). According to estimates from the World Health Organization (WHO), hypertension is the primary avoidable cause of death globally. Worldwide, an estimated 1.28 billion persons between the ages of 30 and 79 have hypertension. Approximately 21% of adult hypertensive patients have their hypertension under control. Adults with hypertension were 594 million in 1975; by 2015, that figure had risen to 1.13 billion, with low- and middle-income nations seeing the largest increases. Changes in lifestyle have been shown to help reduce high blood pressure including quitting tobacco. Despite the well-established link between smoking and hypertension, many hypertensive individuals struggle to quit smoking. They face unique challenges, including nicotine addiction, co-morbidities, habitual behaviors, and psychological dependencies. Tobacco is a known risk factor for hypertension (Benowitz & Burbank, 2016). The brief intervention for smoking cessation's main aim is to provide people with hypertension with the tools, motivation and support they need to quit smoking. It improves health outcomes by reducing tobacco use, lowering blood pressure levels, and ultimately decreasing the incidence of cardiovascular complications in this high-risk population (Lancaster & Stead, 2017). Any progress in reducing smoking rates, no matter how small, is a step towards improving public health and reducing the burden of tobacco-related diseases (Physiopedia, 2023). Brief interventions provide an opportunity to share the knowledge, raise awareness, and involve people in thinking about making the changes needed to improve their health and behavior. In this research, the "5A" model is employed to help addicts in cessation of tobacco usage, which is given by the US Department of Health & Human Services. Brief intervention is used as an interventional approach. Smoking is a modifiable risk factor for hypertension. Nicotine contained in cigarettes stimulates the sympathetic nerves and raises the blood pressure. A short-term intervention is a cost-effective smoking cessation approach. The 5A (Ask, Advise, Assess, Assist, Arrange) framework provided by WHO is effective in delivering short-term tobacco interventions in primary care. Additional studies are required to ascertain the practical application and efficacy of short-term interventions in clinical practice, especially for hypertensive patients with smoking (Wikipedia, 2023). These research findings can contribute to better hypertension management and reduced cardiovascular risks for this high-risk patient population (Shah et al., 2018). Brief Intervention is one such approach that is cost-effective, less time consuming & is more effective. Most of the tobacco cessation programs are usually generalized for all tobacco users, but in the case of individuals with hypertension, there is an urgent need to stop the usage of tobacco, as tobacco is directly related to an increase in hypertension (Kalkhoran & Benowitz, 2018), and to lessen the gap between the knowledge and practice related to clinical implementation of brief intervention, this study is conducted. By conducting a study focused on a brief intervention for this specific population, we aim to improve the overall health of patients by increasing their readiness to change tobacco use behavior and facilitating treatment initiation, which means initiation corresponds to the first delivery of a treatment to a patient.

Materials And Methods

This study is an experimental study. Ethical Approval was taken from the Institutional Ethical Committee (Ref. code: XIIV-PGTSC-11B/P7). The study enrollment period was from January to March 2023. The subjects were recruited from the department of cardiology of a tertiary care hospital in northern India. A non-probability purposive sampling technique was employed to select the patients for this study. The inclusion criteria for the study were that the patients with hypertension who were using tobacco in smoking, smokeless, or both forms, who were visiting the Department of Cardiology, aged between 18 and 60 years, were included in the study. Whereas hypertensive patients who, along with using tobacco, consume other psychoactive substances, who are diagnosed with severe forms of medical and psychiatric illness, and who are currently engaged in other smoking cessation programs were excluded. Subjects who fulfilled the inclusion criteria were approached by the principal investigator as they attended the cardiology OPD for their treatment, and those who agreed to participate in the study were selected. After this selection, each subject completed a questionnaire and then had a face-to-face interview with the principal investigator based on the questionnaire. The questionnaire included socio-demographic data, ASSIST, readiness to change questionnaire.

Subjects were given a brief intervention based on the "5A" model by the principle investigator (World Health Organization; 2014). The brief intervention included the following:-

This framework is based on the 5 A's approach, which stands for Ask, Advise, Assess, Assist, and Arrange.

Ask

This component involves asking every patient in detail about their tobacco use at every visit

Advice

A clear and personalized message to quit tobacco usage explaining about the benefits of quitting and the risks associated with continued tobacco use is been delivered by the researcher.

Assess

Patient's interest in quitting tobacco is being accessed. This step involves determining the individual's readiness to change

using Readiness To Change Questionnaire. Understanding their level of commitment can help the researcher to tailor the intervention appropriately.

Assist

This involves setting a quit date & providing support and guidance to help the individual quit tobacco usage. It include discussing strategies, providing educational materials, and providing counseling & referring the client to specialized smoking cessation program.

Arrange

This step involves arranging a subsequent follow up contact after 15 days to monitor progress, provide further support, and address any challenges or concerns that may arise during the quitting process.

The duration of each interventional session is typically around 15 to 20 minutes. In this framework, there are two assessments conducted: The first assessment is performed on the same day the intervention is provided to assess the patient's readiness to change. The second assessment takes place 15 days after providing the intervention and assesses both readiness and treatment initiation.

These assessments help evaluate the patient's progress and adjust the intervention as needed. This framework is specifically designed for brief interventions in the context of tobacco cessation. The primary investigator has done all assessments in order to avoid assessment biases. Validated tools were used. Sample size was calculated as 80. So, screening of patients was done until desired sample size has been reached.

Assessment Instruments

Tool-1: Socio-Demographic and Clinical Variables Tool

This tool is a semi-structured questionnaire developed by the researcher with guidance from the research advisor. It includes various items used to collect socio-demographic and clinical data from the patients. The socio-demographic section covers gender, age, marital status, residence, educational status, employment status, occupation, locality, house, monthly family income, and relationship with the head of the household. The clinical variables section includes age of tobacco use initiation, form and brand of tobacco used, frequency of tobacco use, last dose taken, time since the last dose, medication use, daily expenditure on tobacco, reasons for starting tobacco use, factors that maintain tobacco use, cessation attempts, reasons for quitting or relapsing, presence of medical or psychiatric illnesses, and enrollment in tobacco cessation programs.

TOOL-2: ASSIST (The Alcohol, Smoking, and Substance Involvement Screening Test)

This tool is used for screening tobacco dependence and is developed by the World Health Organization (WHO). It was specifically designed to assess alcohol, smoking, and substance involvement. In this study, the ASSIST was used to screen patients for tobacco dependence and gather relevant information (WHO ASSIST, 2002).

TOOL-3: Readiness to Change Questionnaire

This questionnaire is utilized to assess the stage of change in individuals regarding their readiness to change tobacco use behaviors. The questionnaire consists of 12 items and is based on Prochaska and DiClemente's stage of change model, which was developed in 1992. The responses from this questionnaire provide insights into patients' current stage of change and their readiness to initiate treatment for tobacco use and hypertension (Resolvology, 2024).

Statistical Analysis

The STATISTICAL data analysis was done using MS Excel 365 and IBM SPSS Statistics (Version 24), according to the study's goals. The socio-demographic factors, clinical variables, and other pertinent patient information will be compiled using descriptive statistics, including means, frequencies, percentages, and standard deviations. To investigate the relationship between socio-demographic factors and treatment beginning or readiness for change, the chi-square test is employed. Before and after the Brief Intervention, differences in treatment beginning and readiness to change were evaluated using a paired t-test. The outcomes of a paired samples t-test performed on the change readiness scores before and after. The correlation between the patient's readiness to change score before the intervention and the commencement of therapy for hypertension was best determined using the chi-square test. A *p-value* of less than 0.05 was deemed significant.

Results

Sample Characteristics

A total of 100 samples were examined, of which 80 patients were included in the study (Figure 1). The sample population comprises primarily of males (97.5%), within the age range of 18 to 60. They were mostly married, residing in urban areas, and owning their homes. Many had completed secondary education (33.8%) or graduate studies (31.3%). The majority were employed, with business being the most common occupation (38.8%). Monthly family income varied, with 47.5% earning between 16,000 and 30,000 rupees.

The sample consisted of 80 patients, of which 2.5% were female and 97.5% were male. The patients' ages ranged from 18 to 60 years, with the majority falling into the 31 to 50 year age range. On estimation, it is found that 77.5% use smokeless tobacco, 15% use both smoke and smokeless tobacco, and 7.5% use only smoke. The majority of the respondents (45%) were still using chewing tobacco. The main reason for starting to smoke was peer pressure (69%), with stress being an important factor (14%). The most common maintaining

Table 1: Frequency and percentages of distribution of socio - demographic and clinical variables of samples.N=80

S. No.	*Name of variables*	*Frequency (f)*	*Percent (%)*
1	Gender		
	Female	2	2.5
	Male	78	97.5
2	Age (in years)		
	18-30	18	22.5
	31-40	22	27.5
	41-50	19	23.8
	51-60	21	26.3
3	Marital status		
	Married	61	76.3
	Unmarried	18	22.5
	Widower	1	1.3
4	Residence		
	Rural	26	32.5
	Urban	54	67.5
5	Educational status		
	Graduate	25	31.3
	Illiterate	2	2.5
	Post graduate	2	2.5
	Primary education	24	30.0
	Secondary education	27	33.8
6	Employment status		
	Employed	67	83.8
	Retired	1	1.3
	Unemployed	12	15.0
7	Occupation		
	Businessman	31	38.8
	Daily wage worker	11	13.8
	Farmer	14	17.5
	Students	8	10.0
	Service	14	17.5
	Others	2	2.5
8	Locality		
	Rural	22	27.5
	Urban	58	72.5
9	House		
	Owned house	69	86.3
	Rented	11	13.8
10	Monthly family income (in rupees)		
	16-30k	38	47.5
	5-15k	14	17.5
	More than 30k	28	35.0
11	Form of tobacco used		Cont..
	Smokeless	62	77.5
	Smoke	6	7.5
	Both	12	15.0
12a	Usual dose of smokeless tobacco*		
	Up to 5 Packets Per Day	56	70
	5-10 Packets Per Day	12	15
	>10 Packets Per Day	12	15
12b	Usual dose of Smokable Tobacco*		
	Up to 5 cigarettes per day	6	7.8
	5-10 cigarettes per day	2	2.6
	>10 packets per day	0	0
13	Medicine in use		
	Anti-hypertensive	46	57.7
	Lipid lowering agents	3	3.9
	None	31	38.8
14	Reason for starting tobacco		
	Curiosity	10	12.5
	Others	3	3.8
	peer pressure	55	68.8
	role model	1	1.3
	Stressors	11	13.8
15	Maintaining factors		
	low self esteem	2	2.5
	nature of work	28	35.0
	Others	4	5.0
	Stressors	46	57.5
16	Cessation attempts		
	multiple unsuccessful attempts	20	25.0
	multiple successful attempts	4	5.0
	no attempts	56	70.0
17	Medical illness*		
	Angina / MI	24	30.5
	Hypertension	47	59.3
	Others	7	8.9
	None	17	21.3
18	Enrolment in tobacco cessation		
	No	80	100.0

*data is not mutually exclusive.

factor for tobacco use was stressors (58%), followed by the nature of work (35%). The majority of respondents (70%) reported no attempts to quit tobacco, while (25%) had made multiple unsuccessful attempts and only (5%) had made multiple successful attempts. None of the respondents were reported to be enrolled in tobacco cessation programs (Table 1). Pre-intervention scores of readiness for change showed that no one was in the pre-contemplation phase, the majority (87.5%) of all cases were in the contemplation phase, 10%

Table 2: Showing frequency and percentage of pretest scores of readiness of change

S. N.	*Category of readiness*	*Readiness of change scores*	
		Frequency	*Percentage*
1	Contemplation phase	70	87.5
2	Action phase	8	10.0
3	Maintenance phase	2	2.5

Table 3: Showing frequency and percentage of post-test scores of readiness of change

S. No.	*Category of readiness*	*Readiness of change scores*	
		Frequency	*Percentage*
1	Contemplation phase	64	80.0
2	Action phase	12	15.0
3	Maintenance phase	4	5.0

Table 4: Showing descriptive statistics of pretest and posttest scores showing the effectiveness of Brief Intervention on readiness to change

Paired Samples Statistics					
		Mean	*N*	*Std. Deviation*	*Std. Error Mean*
Pair 1	Posttest	110.20	80	5.71	0.63
	pretest	97.41	80	7.56	0.84

cases were in the action phase, while only 2.5% cases were in the maintenance phase for readiness of change (Table 2).

Post-interventional scores of readiness for change showed that no one case was in the pre-contemplation phase, the majority (80%) of all cases were in the contemplation phase, 15% cases were in the action phase, while only 5% cases were in the maintenance phase for readiness of change (Table 3).

It represented the descriptive statistics for before and after the interventional scores of a sample. Before intervention, the score was 110.20, and the mean value after intervention was 97.41. The standard deviation for after interventional scores was 5.71 & before intervention, the scores were 7.56. The standard error of mean before intervention scores was 0.6388 & after intervention it was 0.84. Overall, the descriptive statistics suggest that the scores after intervention were higher

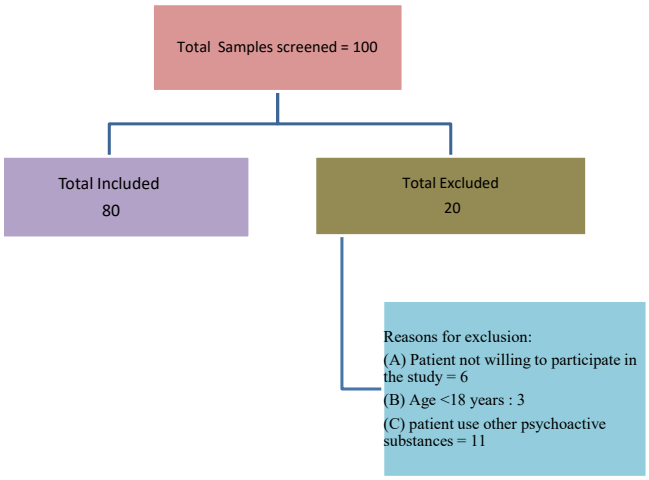


Figure 1: Selection of Sample and Reason for Exclusion

than the pre-intervention scores (Table 4).

The results suggest that there was a significant increase in readiness for change from before and after the intervention was given. This table shows that the mean difference before and after the intervention is 12.78. The standard deviation of the variance is 8.42 and the standard error of the mean is 0.94. The 95% confidence interval for the difference in means is 10.91 to 14.66, which indicates that you can be 95% sure that the difference in means is within this interval. With a degree of freedom of 79, the t-value is 13.58 and the *p-value* is < 0.001. It showed that the difference between the scores was statistically significant at the .05 level. (Table 5)

Discussion

In this study, we targeted a specific population which is earlier not been addressed i.e., patients with hypertension who use tobacco. Considering it a common comorbidity, we targeted this population. The objective of this study was to check the effect of a brief intervention on readiness to change and treatment initiation in patients with hypertension using tobacco. The findings of this study suggest that the intervention was effective in increasing readiness for change. The mean difference between the scores before and after the intervention is statistically significant. The findings of this study have shown that the majority of patients were in the contemplation phase of readiness to change. A few patients

Table 5: Showing result of t-test statistics between pretest-posttest scores for readiness of change

Paired Samples Test								
Test scores	*Paired Differences*					*T*	*Df*	*Sig. (2-tailed)*
	Mean	*Std. Deviation*	*Std. Error Mean*	*95% Confidence Interval of the Difference*				
				Lower	*Upper*			
posttest – pretest	12.78	8.42	.9414	10.91	14.66	13.58	79	<.001 *

* = p<0.05 level of significance; 95% confidence interval

were in the action phase. And very few amongst them were in the maintenance phase. These results are very similar to those found in previous studies, which found that the majority were in the preparation phase, a few were in the contemplation phase and very few amongst them were in the pre-contemplation phase (Opsal et al., 2019). This is very crucial for the healthcare industry to know that increased motivation in patients with hypertension who use tobacco can benefit them in a holistic manner. Healthcare providers can also help them to tailor their interventions to the patient's individual stage of readiness regarding tobacco use. We have found out that the majority of the consumers were males and avid users of the smokeless tobacco form, the majority of them belonged to the middle age bracket, i.e., 31 to 50 years age range. Among them, the majority of participants were employed. In our study, we have found that the most common and main reason to start smoking is peer pressure. Craving for tobacco is the most common reason cited for relapse.

Some of the social characteristics of our study population are similar to previous research findings (World Health Organization; 2014; . Ravishankar & Nagarajappa, 2009; Naik, 2023; Pierce, 2022). The results of this study show a high prevalence of smokeless tobacco use among patients, which is consistent with the overall burden of smokeless tobacco use. The results of this study are consistent with similar studies, which indicate that peer pressure and stress are the main reasons for tobacco use. Which identified curiosity and peer pressure as the primary motivators for trying tobacco (Ravishankar & Nagarajappa, 2009). A similar study aimed to assess the patients' awareness of the tobacco habit and their willingness to quit (Naik, 2023). The significant associations found in this study between age, employment status, monthly family income, cessation attempts, and reason for relapse and readiness for change are also consistent with previous research.

Though there were very few studies done in the Indian setup, those that did address the hypertensive patients who use tobacco are almost negligible in number. Our study revealed that there was an improvement in readiness to change scores, and working on patients' motivation helps the readiness to change of patients.

According to the current study, patients' knowledge of the physical risks of tobacco use was the main factor in their decision to stop using it. Older smokers were less likely than younger smokers to be prepared to give up smoking, according to a comparable study on smokers (Pierce, 2022). Similar findings have been reported in earlier research as well, which showed that a brief intervention aimed at boosting motivation for change and self-efficacy increased a sample of adults with chronic health conditions' readiness for change (Utap et al., 2019), which altogether helps patients in reducing tobacco usage and ultimately pushes them to completely abstain from tobacco usage, and surely helps in treatment initiation. However, the number of patients actually seeking treatment did not greatly increase, and more has to be done to make treatment more accessible to patients.

Limitation

This study has several limitations. The small sample size of this study limits the generalizability of the research findings, the use of non-probability purposive sampling techniques may lead to selection bias and limitation of representativeness sample, and the organization of the research within a single institution may limit the generalizability of the results to other healthcare settings and it had a relatively short follow-up period, limiting the assessment of long-term effects and sustainability of behavior change.

Conclusion

This research can help identify the most effective strategies to enhance readiness to change and treatment initiation in this population, leading to evidence-based nursing practices. Brief intervention is feasible in hypertensive patients who use tobacco, and it helps increase the motivation factor that helps hypertensive patients to stop using tobacco; however, it doesn't make any impact on treatment initiation due to barriers associated with it. Being a public health issue, we need to make treatment accessible and affordable for the population to help them benefit from it.

Ethical Approval

Ethical Approval was taken from the Institutional Ethical Committee at King George's Medical University. *Ref. code: XIIV-PGTSC-11B/P7*

Conflict of Interest

The authors declare that there are no conflicts of interest.

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Author Contributorship Statement

RG is the principal investigator who analyzed the data and wrote the manuscript. SM helped in methodology and literature search, AS, GS and GC edited the manuscript. All authors read and approved the manuscript.

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