

Cigarette smoking and stages of change among men and women in Kiev, Ukraine

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Background: Assisting current smokers to progress towards stopping smoking entails identifying their readiness to stop and understanding the factors that may influence their readiness. Relations were established between certain predictor variables (intensity of smoking, age at initiation, duration of smoking, and gender) and stages of readiness to change smoking behaviour in Kiev, Ukraine. **Methods:** Analysis was based on a convenient sample of 536 current smokers who completed a stages-of-change questionnaire in a public square in the centre of Kiev's business district, between 22 and 25 July 2000. Frequency distributions, odds ratios, the Kolmogorov–Smirnov test and the Wilcoxon rank-sum test were used to summarize and describe the data. Tests of significance were based on the 0.05 level. **Results:** The majority of participants (56.1%) were categorized as precontemplative. Less than 20% of the subjects were prepared for action to change smoking behaviour. Later age at smoking initiation was associated with fewer cigarettes smoked per day. Females were more likely than males to seriously consider cutting down the number of cigarettes they smoked. However, males were more likely to have intentionally quit smoking for at least one day within the past year. **Conclusion:** Information on stages of readiness to stop smoking provided by this study may be useful for improving the effectiveness of smoking cessation programmes in Kiev.

Keywords: adolescents, Eastern Europe, nicotine dependence, readiness to change, smoking cessation

Extensive research has documented the determinants of smoking initiation and cessation, including readiness to change.^{1–4} Most programmes for smoking cessation are action oriented and, therefore, do not serve the majority of the population of smokers.² Previous research shows that identifying readiness to change behaviour and providing equivalent activities may assist an individual's progress through the stages of change to successfully change smoking behaviour.^{2,3} To our knowledge, no previous research has been done to assess readiness to change behaviour among current smokers in Kiev. There are four stages of change describing smokers and former smokers: 1) precontemplation, 2) contemplation, 3) action, and 4) maintenance.⁵ In the precontemplation stage, the individual does not recognize smoking as a problem. In the contemplation stage the individual is gathering information about smoking, such as contacting a health care provider, health department, or tobacco quit line for information on the effects of smoking or cessation classes. During this stage the stress and inconvenience of quitting smoking is greater than the immediate and possible long-term health effects from continued smoking. In the preparation stage, intention and behaviour begin to come together and the individual is preparing to enter the action stage in the next 30 days.

Recognizing that the benefits of not smoking outweigh the benefits of smoking is necessary before an individual can enter the action stage and, as a result, change their smoking behaviour. After six months of not smoking, the individual reaches the maintenance stage when different skills may be needed to prevent relapse from those employed in the initial behaviour change.^{3,6}

This study was motivated by the assumption that success in assisting current smokers to progress towards the action and maintenance stages begins by identifying their readiness to quit and understanding the influence of other predictor variables. This study identifies the stages of readiness to change and establishes the relation between select predictor variables (intensity of smoking, age at initiation, number of years smoked, and gender) and stages of readiness to change in a general population in Kiev, Ukraine.

METHODS

Analysis is based on a convenient sample of 536 participants (346 males and 190 females) that completed a questionnaire on 22–25 July 2000, in Kiev, Ukraine. Participants were recruited in a large public square, over two city blocks in size, in the centre of Kiev's business district. Questions were taken from a validated survey on readiness and motivation to quit smoking developed at the University of Illinois at Chicago.¹ This instrument was selected because of its focus on the precontemplation stage. Five items on the questionnaire were used to indicate readiness to change smoking behaviour, four items assessed motivation to decrease the amount of tobacco used and desire to quit, and two items measured

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confidence in the ability to quit. Predictor variable information was also collected on age, gender, number of years participants have smoked, and the number of cigarettes smoked per day. Age at initiation was also determined by subtracting the number of years smoked from the participant's current age.

Crittenden developed a five-stage model to assess readiness, motivation, and confidence in one's ability to quit smoking among women at health clinics in Chicago, Illinois.¹ This model, based on Prochaska's stages of change, divides precontemplation (PC) into three, substages (PC-1, PC-2, and PC-3). This was done in anticipation that a majority of the target population would be in the precontemplation stage.^{5,7,8} A model similar to Crittenden's five-stage model was used to determine readiness, motivation, and confidence to quit smoking in the current study. Stage one (PC-1) is defined as the stage where a person is not seriously thinking of quitting smoking, not planning to quit, and not seriously thinking of cutting down the number of cigarettes smoked. Stage two (PC-2) describes a person who is not seriously thinking of quitting smoking and not planning to quit, but is seriously thinking of cutting down the amount of cigarettes smoked. An individual seriously thinking of quitting smoking or planning to quit, but not within six months, is represented in stage 3 (PC-3). The contemplation stage describes a person who is seriously thinking of quitting smoking and planning to do so within six months. The last stage of this model, preparation for action, describes a person that is seriously thinking of quitting smoking, planning to quit within one month, and has intentionally quit for at least 24 hours within the past year.

The questionnaire was translated into Russian by an individual who has lived in Kiev and is considered fluent in both Russian and Ukrainian. In an attempt to minimize any misunderstanding in the translation, the questionnaire was also assessed and slightly modified by a panel of individuals from Ukraine. Fourteen American students, nine females and five males aged 18 to 25, conducted the survey. Students were divided into pairs, with at least one person per pair confident in speaking either Russian or Ukrainian. Each group administered 25 surveys after receiving the following brief instructions on contacting people to take the survey: i) speak with people

who are sitting down or standing, not walking down the street and ii) ask if the person smokes cigarettes (if not smoking when contacted). If they smoke, iii) introduce yourself as American students learning about smoking in Ukraine and ask if the contact would take a few minutes to complete a survey; iv) if the person declines the invitation, continue to the next person in the area; and v) stay within assigned areas to avoid duplicate contacts. Approximately 75% of persons contacted agreed to complete the survey.

Analysis was done using SAS release 8.0. The questionnaire's ordinal scale does not satisfy the parametric assumptions, so nonparametric methods were used. Frequency distributions, odds ratios, the Kolmogorov–Smirnov test, and the Wilcoxon rank-sum test were used to summarize and describe the data. Tests of significance were based on the 0.05 level.

RESULTS

Age, number of cigarettes smoked per day, age at initiation, and number of years smoked for the respondents are summarized in *table 1*. The normality assumption was considered, based on the Kolmogorov–Smirnov test, with only age at initiation having an approximately normal distribution. The same data is represented by gender in *table 2*. Women in the study were slightly younger than men and smoked fewer cigarettes per day. They began smoking at a later age and smoked for fewer years.

The Spearman rank correlation was used to assess relations between the selected independent variables: number of cigarettes smoked per day, age at initiation, and number of years smoked. The fewer cigarettes smoked per day, the later the age at initiation, $r = -0.0429$ [95% CI] 0.044908 to -0.130708 . The more cigarettes smoked per day, the more years the participant had been smoking, $r = 0.2984$ [95% CI] 0.381504 to -0.215296 .

Table 3 summarizes the stages of change in terms of the participants' readiness, motivation, and confidence in their ability to quit smoking. Over half of the subjects had not decreased their level of smoking in the past 12 months. In response to the question of how sure they were about their ability to reduce the number of cigarettes smoked, 72 participants (13.4%) responded that they were very unsure. More than half of participants were seriously considering reducing the number of cigarettes

Table 1 Demographics of study participants in Kiev, Ukraine, July 2000^a

	Mean	SD	Median	Range
Current age	25.8	9.4	22.0	13–68
Number of cigarettes smoked per day	13.0	7.8	11.0	0.5–55
Age at smoking initiation	17.2	5.0	16.0	6–46
Years smoked (duration)	8.6	7.9	6.0	0.5–47

a: Kolmogorov–Smirnov for testing the normality assumption was rejected (with $p < 0.05$) for each variable except age at smoking initiation. SD: Standard deviation

Table 2 Mean demographic scores for study participants in Kiev, Ukraine, July 2000, according to gender

	Men	Women	z score ^a	p-value
Age	26.2	25.0	-2.2	0.0251
Number of cigarettes smoked per day	15.0	9.3	-8.3	<0.0001
Age at smoking initiation	16.9	17.6	0.89	0.3732
Years smoked (duration)	9.3	7.4	-3.2	0.0016

a: Based on the Wilcoxon rank-sum test.

Table 3 Measures of stages of change (i.e., participants readiness, motivation, and confidence in ability) to quit smoking among participants in Kiev, Ukraine, July 2000

Question		Number	Percentage
1 Compared to what you smoked a year ago, do you smoke?	More	154	28.6
	Less	139	26.1
	No change	196	36.8
	Didn't smoke a year ago	28	5.3
	Don't know	16	3.0
2 In the last 12 months did you purposely decrease the number of cigarettes you smoke, but didn't quit?	Yes	241	45.6
	No	269	50.9
	I quit	19	3.6
3 If you wanted to reduce the amount you smoke, how sure are you that you could do it?	Totally unsure	72	13.4
	Fairly sure	168	31.3
	Sure	210	39.2
	Very sure	85	15.9
4 Are you seriously considering reducing the number of cigarettes you smoke?	Yes	352	65.7
	No	182	34.0
	Don't know	2	0.4
5 At this time, how much do you want to reduce the number of cigarettes you smoke?	Don't want to	108	20.2
	Kind of want to	182	34.0
	Want to	150	28.0
	Really want to	96	18.0
6 How strongly do you intend to quit smoking?	Totally don't intend	113	21.0
	Intend to	183	34.0
	Really intend to	103	19.1
	Don't know	96	17.8
	Withhold answer	43	8.0
7 How much desire do you have to smoke less?	No desire	95	17.7
	Small desire	237	44.2
	Big desire	204	38.1
8 In the last year, have you ever quit smoking on purpose, even for one day?	Yes	423	79.1
	No	112	20.9
9 If you decided to quit smoking, how sure are you that you could do it?	Completely unsure	74	13.8
	Somewhat sure	195	36.3
	Sure	188	34.9
	Very sure	80	14.9
10 Are you now seriously considering quitting smoking?	Yes	324	60.3
	No	213	39.7
11 How badly do you want to smoke?	Don't want to at all	94	17.5
	Somewhat want to	171	31.9
	Want to	167	31.2
	Really want to	104	19.4
12 Do you plan on quitting?	Yes	359	67.6
	No	167	31.5
13 When do you plan on quitting? In ...	1 month	123	27.9
	3 months	73	16.6
	6 months	47	10.7
	>6 months	195	44.2
14 How determined are you to quit smoking?	Completely undetermined	54	10.3
	Undetermined	92	17.6
	Want to	269	51.3
	Really want to	109	20.8

smoked. However, even though the majority of the respondents were seriously considering quitting, they showed different levels of confidence in their ability to reach this goal. Most participants wanted to quit smoking and were determined to do so, but not for at least six more months.

Table 4 summarizes participants' responses according to the five stages of readiness to quit smoking as defined in the Crittenden study, three stages of precontemplation, one of contemplation, and one preparation for action. The percentages for this table were adjusted according to the 504 participants who completed all the items necessary to determine their stage of change. The majority of the participants were categorized as belonging to one of the three stages of precontemplation. Less than 20% of the subjects were prepared for action to change their current smoking behavior.

Finally, we assessed the influence of the number of cigarettes smoked per day, age at initiation, number of years smoked, and gender (female versus male) on the respective stages of change (table 5). In particular, the simultaneous influence of these independent variables was estimated using multivariate logistic regression where the dependent variable in each model reflected whether the subject was in that stage or not. A negative association was observed between cigarettes smoked per day and preparation for action to change smoking behaviour. Younger age at initiation was positively associated with how likely the participants were to consider quitting or reducing the number of cigarettes smoked. Females were

nearly three times more likely than males to seriously consider cutting down the number of cigarettes smoked. However, females were less likely than males to have intentionally quit for at least one day within the past year or to be planning to quit smoking within one month.

DISCUSSION

This study showed significant association between gender and stage of readiness to change. Females were nearly three times more likely than males to be seriously thinking about cutting down the number of cigarettes they smoke. However, males were more likely to have quit smoking on purpose for one day within the past year. Therefore, even though these relations are statistically significant, they appear to contradict each other. Previous research documents other inconsistent results of using gender as a predictor for smoking cessation. Osler and Hymowitz each conducted research which indicated male gender was a predictor of smoking cessation.^{9,10} On the other hand, Zhu and Gritz each reported gender is not a predictor for cessation.^{11,12}

The younger the participants when they began smoking, the less likely they were to consider quitting or reducing the number of cigarettes they smoked. This finding is consistent with previous studies that concluded early age at initiation predicts less interest and confidence in ability to quit.^{13–15} The average age at initiation was 17.2 years, with a range from 13 to 69 years. The Global Youth Tobacco Survey, administered in Kiev in 1999, found that 41.1% of 13 to 16-year-olds are current smokers, and 24%

Table 4 Five stages of readiness, motivation and confidence to change, as they relate to smoking behaviour, among study participants in Kiev, Ukraine, July 2000

Stage	Definition	Percentage ^a (95% CI)	
1	Not contemplating quitting or cutting down (PC-1)	Not seriously thinking of quitting smoking (item 10), not planning to quit (item 12), and <i>not</i> seriously thinking of cutting down (item 4)	24.6 (20.9–28.3)
2	Not contemplating quitting (PC-2)	Not seriously thinking of quitting smoking (item 10), and not planning to quit (item 12), <i>but</i> seriously thinking of cutting down (item 4)	5.4 (3.5–7.3)
3	Not contemplating quitting within 6 months (PC-3)	Seriously thinking of quitting smoking (item 10), or planning to quit (item 12) but not within 6 months (item 13)	26.1 (22.2–29.9)
4	Contemplation	Seriously thinking of quitting smoking (item 10), <i>and</i> planning to quit within 6 months (item 13) <i>but</i> either (a) not planning to quit within one month (item 13) or (b) has not intentionally quit for at least 24 h within the past year (item 8)	24.2 (20.2–28.2)
5	Preparation for action	Seriously thinking of quitting smoking (item 10) <i>and</i> planning to quit smoking within 1 month (item 13) <i>and</i> having intentionally quit for at least 24 h within the past year (item 8)	19.7 (16.2–23.2)

a: Percentages were adjusted based on 504 surveys

Table 5 Adjusted odds of stages of change for study participants in Kiev, Ukraine, July 2000, according to select predictor variables

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Number of cigarettes smoked per day	1.040 (1.010–1.071)	1.009 (0.950–1.072)	1.025 (0.995–1.055)	0.997 (0.963–1.033)	0.938 (0.902–0.975)
Age at initiation	0.945 (0.897–0.995)	1.038 (0.966–1.114)	0.974 (0.929–1.021)	1.041 (0.996–1.088)	1.040 (0.993–1.088)
Years smoked (duration)	0.993 (0.964–1.022)	0.999 (0.946–1.056)	1.011 (0.984–1.039)	1.016 (0.984–1.049)	0.974 (0.938–1.012)
Gender F vs. M	0.902 (0.555–1.464)	2.975 (1.218–7.266)	1.365 (0.859–2.171)	1.366 (0.826–2.260)	0.489 (0.285–0.839)

of them started before the age of 11.¹⁶ This suggests that it is important for tobacco prevention education to continue through late teenage years to delay or prevent onset.

The sample population in the Crittendon study (1994) consisted of female smokers at public health clinics. It is striking that 8.1% of women in their study were not thinking about cutting back or quitting smoking (stage 1), compared to 24.6% of all participants in this study. Although the two studies used a similar instrument, sample types and population demographics were too dissimilar to make comparisons regarding the readiness of all smokers in the USA and Ukraine.

Results from this study may provide important information for health care professionals in Kiev on stages of change among people who use tobacco in their community. Previous research indicates that if an individual can progress from one stage of change to the next – from contemplation to preparation, for example – within 30 days they will double their chance of reaching the action stage in the first six months of participating in the programme.²

The following examples illustrate the impact of assessing an individual's stage of change prior to offering cessation services. Smoking cessation classes were offered to members of a large health maintenance organization (HMO) in the USA. Over 70% of smokers said they would take advantage of a self-help smoking cessation programme if it were offered. When development and marketing of the self-help programme was completed, only 4% of smokers signed up.¹⁷ The programme that was offered was action oriented, while nearly all of the smokers were still in the contemplation or preparation for action stages. In another instance, an intensive smoking cessation programme was offered to cardiac patients with a 94% quit rate after six months. When this programme was offered to the community, it provided no significant assistance in helping people to quit. While it was very effective for participants in the preparation and action stages of behaviour change, for individuals in the general population, most of which are in the pre-contemplation or contemplation stage, the programme was not helpful.

A few limitations of this study need mentioning. First, an objective test measuring readiness to change was not available for Ukraine. Our instrument could not be validated against a recognized existing instrument to determine whether it measured what it was supposed to measure. However, the questions were straightforward with an apparent good understanding among study participants. Second, the results are based on a convenient sample, therefore our ability to generalize the results are limited. In particular, due to the location of the data collection, it is likely that blue-collar workers were not well represented in the sample. Third, it is possible that some individuals failed to participate in the study because they misunderstood the question of whether they smoke cigarettes. To minimize misunderstanding we asked the question in a way that was sensitive to the

culture and people. Finally, selection bias is a potential problem because approximately 25% of the people approached did not participate. Based on the observations of the interviewers, those who did not participate were mostly women over the age of 55.

Similar studies conducted in the future in Kiev may use the results of the current study as a reference and for deriving appropriate sample size. Studies may also investigate the relationship between predictor variables and readiness to quit smoking in a population-based survey for the whole country of Ukraine, beyond the current study. A nationwide smoking prevalence survey would provide important data for programme development by determining demographics and smoking prevalence data of current smokers. Future research may also include assessing cultural norms and the social environment in relation to smoking in Kiev. These factors relate to one's stimulus control, a process of change in the transtheoretical model that focuses on a smoker's surroundings, including the presence of other smokers at home, work, or among friends.

In summary, many insights regarding smoking patterns and attitudes about quitting among current smokers in Ukraine emerged. The younger the age at smoking initiation, the less likely the person is thinking about quitting smoking. Programmes to help people quit should be tailored to an individual's stage of change. Less than one-fifth of study participants were in the preparation for action stage. This indicates that general population programmes need to include elements from various processes of change, not just action-orientated messages. When smokers experience and recognize their progress through the stages of change process, they are more likely to have increased confidence in their ability to quit and be more successful in doing so.

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