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Development of the Psychometric Properties of Secondhand Smoke Exposure Assessment Tools

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Abstract

Background: Secondhand smoke (SHS) exposure poses serious health risks. Nurses' frequent patient interactions position them to effectively utilize SHS assessment tools, promoting individual and community health.

Aim: This study was conducted with aim to design the psychometric properties of SHS exposure assessment tools.

Method: This study was conducted for creating tool items to assess SHS exposure. The study was performed in 2020 on 161 adults with SHS exposure. The psychometric properties steps include face validity, content validity, construct validity and reliability. The principal component analysis was used to test the construct validity of the scale. The reliability of the tools was tested using Cronbach's alpha coefficient.

Results: The questionnaire consisting of 26 items regarding four factors, Home Exposure, Workplace Exposure, Socializing Exposure Feeling, and Toward Dependency on Nicotine, explained a cumulative variance of 0.57. The face validity of the questionnaire was evaluated; all items had an impact score above 1.5. Additionally, the content validity ratio was 0.82, and the content validity index was 0.79. Finally, the reliability of the questionnaire was approved based on Cronbach's alpha coefficient of 0.88.

Implications for Practice: As the findings of this study showed, the validated tool offers a reliable measure for assessing secondhand smoke (SHS) exposure, enhancing accuracy in clinical, community, and research settings. Nurses can use this tool to identify at-risk patients, implement evidence-based interventions, and promote smoke-free environments.

Keywords: Cigarette, Psychometric properties, Questionnaire, Secondhand smoke, Tobacco

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Introduction

Cigarette smoke can primarily affect the health of non-smokers, as evidenced by their serum biomarkers (1). Similar to smokers, non-smokers who are exposed to tobacco smoke absorb nicotine and its metabolites. Secondhand smoke (SHS) exposure can cause respiratory infections, cancers, and periodontal diseases (2-4). A study on second-hand smoke (SHS) exposure in Iran from 2009 to 2020 found an increasing trend in SHS exposure, with the highest disease burden linked to lower respiratory infections (LRI), asthma, and otitis media. The rate of asthma rose from 17.4 in 2009 to 21.3 in 2020 (5). Assessment of SHS exposure among cardiac patients showed that 72.09% of patients were exposed, with 69.30% reporting exposure in public places. Additionally, 39.07% of patients were exposed to SHS in public spaces at least once a week, highlighting the significant impact of public SHS exposure on cardiac health (6).

Laboratory methods for assessing SHS exposure include urine, blood, saliva, hair, and nail nicotine analysis. Each method has advantages, such as ease of collection or long-term exposure assessment, but also has limitations like contamination, sample variability, and privacy concerns (7-10). Researchers use various methods to assess SHS exposure, which questionnaires are popular for their low cost and non-invasiveness (11). The literature review showed that various questionnaires were developed to measure SHS exposure, using binary yes/no responses, open-ended questions, or focusing solely on a single exposure area. However, many SHS questionnaires lack standardized scoring and psychometric rigor (12, 13). In this regards, Baheiraei et al. estimated infant SHS exposure by tracking daily cigarette use in the infant's presence (14). Nasir-Zadeh and colleagues examined tobacco use among Qom adolescents and its relation to SHS exposure with a four-question yes/no survey (15). Vakili et al. also assessed SHS exposure among Zahedan students, defining it as daily or mild (non-daily) exposure over three years (16).

Studies have shown a positive correlation between questionnaire results and laboratory markers such as hair and saliva cotinine. Some questionnaires are specifically designed for various settings (home, work, social) and age groups, including children, with significant associations observed with hair nicotine concentrations (13, 17).

Nurses play important role in preventing secondhand smoke (SHS) exposure by educating individuals, advocating for smoke-free environments, and providing counseling. Using evidence-based practices, nurses can design tailored interventions, like smoking cessation programs to reduce SHS exposure and promote long-term health (18). The present study was conducted with aim to design the psychometric properties of SHS exposure assessment tools.

Methods

This psychometric study was conducted after obtaining permission from the Ethics Committee of Zanjan University of medical sciences in 2020. The study population consisted of SHS-exposure people who are residents of Zanjan, a city in northwest of Iran. The inclusion criteria were: age above 18 years; SHS exposure; and willingness to participate in the study. SHS involves inhaling smoke from others smoking tobacco products in both indoor and outdoor environments, impacting non-smokers. The samples that did not complete the questionnaire or were unwilling to continue their participation in the study were excluded. Commonly, an adequate sample size for the principal component analysis is 5-10 cases per item (19, 20). In this study, the sample size for the principal component analysis was considered 6 cases per item of the questionnaire. The final sample size was 161 participants. People referred to the Dental School of Zanjan University of Medical Sciences for oral and dental care were selected by the convenience sampling method. The participants' demographic data, including age, sex, and education were recorded and collected.

Search strategies

The original articles were searched in electronic databases including Pub Med and Scopus using the Mesh browser keywords from 2000 up to 20 December 2020. Search strategies in PubMed: ("Tobacco Smoke Pollution"[Mesh] OR "Environmental Tobacco Smoke Pollution" OR "Passive Smoking" OR "Secondhand Smoking" OR "Involuntary Smoking") AND ("questionnaire-based study design" OR " self-report"). Search strategies in SCOPUS: TITLE-ABS-KEY ((“Tobacco Smoke Pollution*” OR “Environmental Tobacco Smoke Pollution” OR “Passive Smoking” OR “Secondhand Smoking” OR “Involuntary Smoking”) AND (“questionnaire-based study design” OR “self-report”)).

The item generation

A total of 575 articles were identified from the primary search. Studies focusing on children or those where SHS exposure was assessed using a single yes-or-no question were excluded. The item generation phase of this study was performed by 11 key articles (11-13, 17, 21-27). After extracting the items from the studies, the duplicates and items with ambiguous wording were removed. This step led to a reduction of items from 109 to 70 items. The main reason for this reduction was to ensure clarity and to avoid overlap in the content. The 70 items were then evaluated by a panel of experts to assess their relevance to the study's objectives. Through expert discussions and consensus, a final list of 26 items was selected. Some items were removed because they were not sufficiently aligned with the study's goals or were deemed redundant based on the panel's feedback. Then, to assess their alignment with the study's objectives, the collected items were then evaluated by a panel of experts, including a community health nurse, an epidemiologist, an addiction specialist, a clinical psychologist, a health promotion expert, and two specialists in screening tool design.

The psychometric properties of designed tools

The steps of psychometric properties include face validity, content validity, construct validity, and reliability of designed tools (Figure 1).

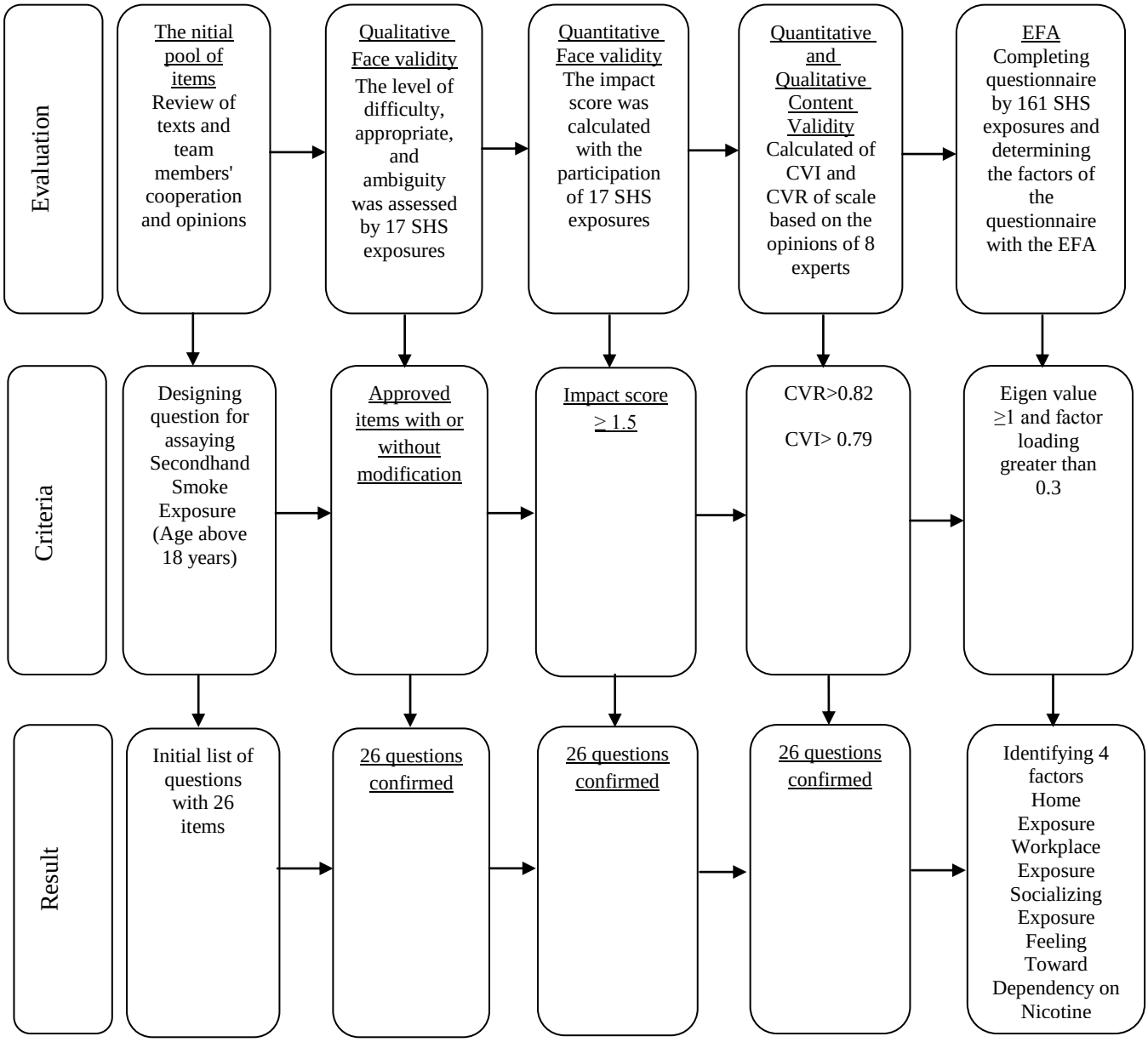

Figure1: Flowchart of psychometric procedures

Face validity: There is no guideline to select the participants of face validity (28). Based on experience, 10-15 participants can give enough good recommendations. Face validity determines whether a tool appears to measure what it is supposed to and if the questionnaire sentences are simple enough for the respondents. To assess the face validity, 17 participants were selected to express their opinions about the tool items relation to the study goal and the difficulty level or ambiguity of sentences.

The item impact score method was used to assess the face validity to exclude irrelevant items and assign a level of importance to them. To reach this goal, a five-point Likert scale was applied for each item: essential (score 5), relatively important (score 4), somewhat important (score 3), of little importance (score 2), and not necessary (score 1). The impact score was calculated based on the following formula:

Impact score= Frequency (%) × Importance

Content validity: Quantitative content validity is used to assess the universality of a questionnaire. Eight experts, including two epidemiologists, one specialist in addiction studies, two health education and health promotion lecturers, two dentists, and one specialist in psychometric properties, who were all academic staff members at Zanjan University of Medical Sciences, were invited to assess the content validity of the questionnaire across both qualitative and quantitative stages. They were asked to write their suggestions about the content coverage, language structure and phrasing, and position of the items in the questionnaire. Generally, content validity is evaluated to ensure that the most important and relevant items are selected and that the questions are designed to assess the content in the best way possible. In this study, the content validity ratio (CVR) and content validity index (CVI) were calculated. Following the calculation of the Content Validity Ratio (CVR), the obtained index was compared with the values provided in the Lavshe table. The critical value for 8 participants was 0.75 in the Lauche table. Higher calculated values indicate that the content validity of the questionnaire is good. The Lavshe table indicates that 5 to 40 individuals can provide opinions to assess content validity, with a critical value serving as the cut-off point for the number of selected participants.

Construct validity: Construct validity refers to data adequacy for measuring the constructs. It determines how well the items measure a construct. A principal component analysis (PCA) is performed when no enough data exists about the constructs of the study. It is commonly calculated after assessing the correlation matrix or related factors. A PCA is performed, for latent variables, a varimax rotation with an eigenvalue above one at a cutoff point of 0.5 was conducted. In this study, the proper load factor for each item in the component matrix and varimax rotation was considered at least 0.3. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity (BT) were performed to assess the appropriateness of cases for factor analysis, and a scree plot was also applied to assess the number of factors; the level of assurance was 95%.

Reliability: Internal consistency refers to the consistency of items in a questionnaire and represents the divergence of questions. Higher internal consistency values suggest high consistency between the items and show that the tool can measure a variable with greater consistency. A Cronbach’s alpha above 0.7 shows the acceptable internal consistency of a questionnaire. In this study, the reliability of tools was measured using Cronbach’s alpha. Internal consistency was conducted on 100 participants.

Stability: The intraclass correlation coefficient (ICC) was used to assess stability. Test-retest assessments were conducted on a group of 15 participants at two-week intervals.

The collected data were analyzed in SPSS (version 16). Descriptive statistics were measured to describe the data. Exploratory factor analysis with a principal component analysis method was performed for estimating factors and underlying constructs.

Ethical Consideration

All procedures of the study were in accordance with the protocol of the regional ethical research committee and with the declaration of Helsinki 1964. This study was approved by the Ethics Committee of Zanjan University of Medical Sciences. Written informed consent was obtained from all participants. Participation in the research was completely voluntary and the participants were allowed to leave the study at any time.

Results

The study included a total of 161 participants (95 male (59%) and 66 female (41%)). The majority had a bachelor's degree (55.3%), followed by participants with a master's degree (16.1%), an associate's degree or a doctorate (each 7.5%), diploma (11.2%), and below diploma (2.5%). In terms of age, most participants were in age range of 26–35 years (48.8%), followed by those aged 18–25 years (37.9%), 36–45 years (9.9%), and more than 46 years (3.7%). The mean age of the participants was 29.21±48.8 years.

Table 1: The final version of SHS exposure assessment tools

	Items	Scoring			
1	Is smoking/tobacco permitted in your home?	Not at all (0)	Rarely (1)	Often (2)	Always (3)
2	How many people in your family use cigarettes/tobacco?	No one (0)	One Person (1)	Two Persons (2)	3 persons ≥ (3)
3	How many members of your family smoke cigarettes/tobacco inside the home?	No one (0)	One Person (1)	Two Persons (2)	3 persons ≥ (3)
4	On average, how many times does each member of your family smoke cigarettes/tobacco per day?	None (0)	Once (1)	Twice (2)	3 times ≥ (3)
5	Where does everyone smoke cigarettes/tobacco in your house?	Open space (0)	Next to the open window (1)	Inside room with an open window (2)	Inside the room with a closed window (3)
6	How many smokers and tobacco users visit your home during the week?	No one (0)	One person (1)	Two persons (2)	3 persons ≥ (3)
7	How much are you exposed to cigarette and tobacco smoke at home?	Not at all (0)	Low (1)	Medium (2)	High (3)
8	Are smoking and tobacco permitted in your workplace?	Not at all (0)	Rarely (1)	Often (2)	Always (3)
9	How many of your colleagues smoke cigarettes/tobacco at work?	No one (0)	One Person (1)	Two Persons (2)	3 persons ≥ (3)
10	How many times does each of your colleagues smoke cigarettes/tobacco per day?	None (0)	Once (1)	Twice (2)	3 times ≥ (3)
11	Apart from your colleagues, how many smokers and tobacco users come and go to your workplace every week?	No one (0)	One Person (1)	Two Persons (2)	3 persons ≥ (3)
12	How much are you exposed to cigarette smoke at your workplace?	Not at all (0)	Low (1)	Medium (2)	High (3)
13	How many times a week do you go out to socialize with smokers?	None (0)	Once (1)	Twice (2)	3 times ≥ (3)
14	How many times a week do you visit friends and relatives who smoke?	None (0)	Once (1)	Twice (2)	3 times ≥ (3)
15	How many times a week do you go to a cafe or restaurant?	None (0)	Once (1)	Twice (2)	3 times ≥ (3)
16	How many people smoke cigarettes and tobacco in the cafe or restaurant you visit?	No one (0)	One Person (1)	Two Persons (2)	3 persons ≥ (3)
17	To what extent are you exposed to cigarette smoke in a cafe or restaurant?	Not at all (0)	Low (1)	Medium (2)	High (3)
18	How many people smoke cigarettes and tobacco at a family and friends' party?	No one (0)	One Person (1)	Two Persons (2)	3 persons ≥ (3)
19	How many hours do you usually stay at a family party or with friends who smoke?	None (0)	one hour (1)	two hours (2)	3 hours ≥(3)
20	To what extent are you exposed to cigarette smoke when you go out to socialize?	Not at all (0)	Low (1)	Medium (2)	High (3)
21	Is smoking permitted in the car you are using?	Not at all (0)	Rarely (1)	Often (2)	Always (3)
22	On average, how many minutes do you spend in this car every day?	less than 10 minutes (0)	10 to 20 minutes (1)	20 to 30 minutes (2)	more than 30 minutes (3)
23	How often do you have a strong urge to smell smoke?	Not at all (0)	Rarely (1)	Often (2)	Always (3)
24	How psychologically dependent are you on cigarette smoke and tobacco fume?	Not at all (0)	Low (1)	Medium (2)	High (3)
25	How physically dependent are you on cigarette smoke and tobacco fume?	Not at all (0)	Low (1)	Medium (2)	High (3)
26	How often do you feel that you need cigarettes and tobacco fume?	Not at all (0)	Rarely (1)	Often (2)	Always (3)

The majority of participants reported moderate secondhand smoke exposure at home (40%), in the workplace (50.9%), and socially (51.6%). High secondhand smoke exposure was less common but present in 22.5% at home, 21.1% at work, and 23.6% socially. Regarding nicotine dependency, most participants (64%) had no or low dependency, while 24.8% had high dependency, and 11.2% had moderate dependency.

Table 2: Assessment of secondhand smoke exposure items with impact scores, content validity ratio (CVR), and content validity index (CVI)

	Items	Impact Score	CVR	CVI
1	Is smoking/tobacco permitted in your home?	8.3	0.75	0.91
2	How many people in your family use cigarettes/tobacco?	7.8	1	0.91
3	How many members of your family smoke cigarettes/tobacco inside the home?	7.42	1	1
4	On average, how many times does each member of your family smoke cigarettes/tobacco per day?	7.8	1	1
5	Where does everyone smoke cigarettes/tobacco in your house?	6.06	1	1
6	How many smokers and tobacco users visit your home during the week?	5.04	0.75	0.95
7	How much are you exposed to cigarette and tobacco smoke at home?	8.5	1	0.91
8	Are smoking and tobacco permitted in your workplace?	8.3	1	1
9	How many of your colleagues smoke cigarettes/tobacco at work?	7.52	1	1
10	How many times does each of your colleagues smoke cigarettes/tobacco per day?	8.1	1	0.95
11	Apart from your colleagues, how many smokers and tobacco users come and go to your workplace every week?	7.33	0.75	1
12	How much are you exposed to cigarette smoke at your workplace?	7.61	1	0.87
13	How many times a week do you go out to socialize with smokers?	6.77	1	1
14	How many times a week do you visit friends and relatives who smoke?	6.86	1	1
15	How many times a week do you go to a cafe or restaurant?	5.11	0.75	1
16	How many people smoke cigarettes and tobacco in the cafe or restaurant you visit?	6.15	1	1
17	To what extent are you exposed to cigarette smoke in a cafe or restaurant?	5.62	1	0.95
18	How many people smoke cigarettes and tobacco at a family and friends' party?	7.23	1	1
19	How many hours do you usually stay at a family party or with friends who smoke?	8.2	1	1
20	To what extent are you exposed to cigarette smoke when you go out to socialize?	6.86	1	1
21	Is smoking permitted in the car you are using?	6.86	1	1
22	On average, how many minutes do you spend in this car every day?	7.52	0.75	0.91
23	How often do you have a strong urge to smell smoke?	7.42	0.75	0.91
24	How psychologically dependent are you on cigarette smoke and tobacco fume?	6.77	0.75	1
25	How physically dependent are you on cigarette smoke and tobacco fume?	6.77	0.75	1
26	How often do you feel that you need cigarettes and tobacco fume?	6.86	0.75	1

Construct validity: The results of PCA showed that the KMO value was 0.822. It was above 0.7; therefore, the adequacy of data was approved for further analysis. The BT test result was also significant, which indicated the adequate relatedness of variables for factor analysis. For the four extracted factors, the cumulative variance was measured, which was 0.57. These four factors could explain 0.57 of the variances (Table 3).

Table 3: A principal component analysis eigenvalue and cumulative variance percentage driven by 4 factors

Factors	Initial eigenvalue			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	7.40	28.46	28.46	7.40	28.46	28.46	4.40	16.92	16.92
2	3.00	11.53	40.00	3.00	11.53	40.00	4.31	16.59	33.51
3	2.38	9.18	49.18	2.38	9.18	49.18	3.28	12.64	46.16
4	2.06	7.93	57.11	2.06	7.93	57.11	2.84	10.95	57.11

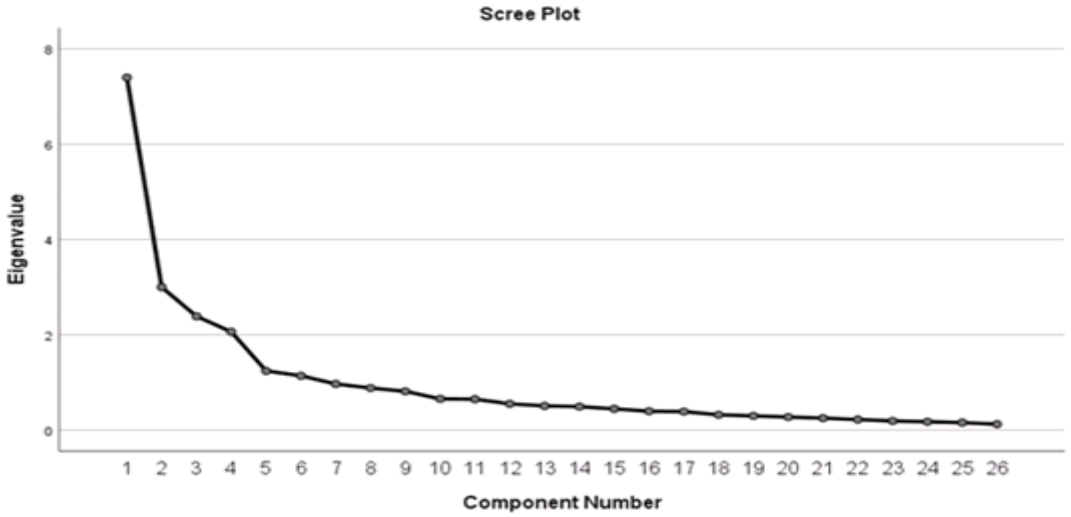

Figure 2: Scree plot and component number

Generally, the factor load for each item indicates its consistency concerning all the other items in that group. If the factor load is below 0.3, the item is excluded. In this study, since this value was not below 0.3 for any of the 26 questions, none of them were excluded. The scree plot indicated four factors with factor loads above one, which approves our four-factor construct. This suggests that these four factors explain a substantial portion of the variance in the data, with each factor having a strong contribution to the overall model (Figure 2).

Reliability: The Cronbach's alpha coefficient for all the items was 0.88; which was found to be appropriate (Table 4).

Stability: According to Table 5, the ICC for all the items was 0.93; the lowest ICC was 0.87, while the highest value was 0.97.

Table 4: Cronbach alpha for all questions and four factors

Factor	Total Questions	Cronbach alpha
Home exposure	7	0.867
Workplace exposure	5	0.813
Socializing exposure	10	0.851
Feeling toward dependency on nicotine	4	0.849
Total	26	0.886

Discussion

The present study aimed to develop a questionnaire by reviewing the literature, which resulted in the approval of the Secondhand Smoke Exposure Assessment Tools with four factors and 26 items. The factors named based on the concepts of the items, including home exposure, workplace exposure, social settings, and dependency on nicotine. All the items had acceptable face validity by an impact

score above 1.5. Also, the CVI and CVR values were appropriate for all the items. Besides, the reliability of the questionnaire was approved with a Cronbach's alpha of 0.88. Overall, the developed questionnaire showed adequate validity and stability to assess SHS exposure in adults.

Jeemon et al. in a study in India (2010) compared serum cotinine levels with self-reported secondhand smoke (SHS) exposure questionnaire. The questionnaire assessed exposure to tobacco smoke and the number of cigarettes per day in a single item, resulting in a low sensitivity of 43% for passive smoking (30). One possible reason for the low sensitivity of the questionnaire in their study may be the limited number of items used to assess secondhand smoke (SHS) exposure. In the current study, the questionnaire included four factors related to SHS exposure settings and the feeling of dependency on nicotine. All items in the current study demonstrated appropriate validity and stability. However, the sensitivity and specificity were not evaluated in this study, suggesting that further complementary research could be beneficial. Abdullah et al. in Malaysia (2019) compared the results of a self-report questionnaire for assessing SHS exposure with urine cotinine and cotinine levels using the high-performance liquid chromatography (HPLC) method. There was an item for evaluation of the smoking status; it was related to the number of cigarettes smoked by the number of smoker family members and the number of days exposed for non-smokers. Besides, there were two items for workplace exposure. The results showed a significant positive relationship between the urine cotinine level and smoking status, number of cigarettes, and smoking history. The sensitivity of the questionnaire was estimated at 42.3%; specificity was estimated at 96.7%; the positive predictive value was 84.6%; and the negative predictive value was 81.7%. According to the questionnaire results, the prevalence of smoking was 13.42%, while according to cotinine levels >1.51 ng/mg, it was 26.84%, which indicates that the self-report questionnaire had a low sensitivity for assessing SHS exposure (31). In the present study, the psychometric properties were assessed to increase the questionnaire validity, while this was not done in the mentioned study.

Che et al. in Malaysia in a study in 2009 assessed the correlation between the results of a self-report questionnaire for assessing SHS exposure with urine cotinine and nicotine level. Based on the self-report questionnaire, the cutoff point for differentiating smokers from non-smokers was 25 ng/m. The sensitivity and specificity of the questionnaire were 92.6% and 98.5%, respectively. Also, at a cutoff point 4 ng/mg, the sensitivity and specificity for differentiating secondhand smokers from non-smokers were estimated as 31.9% and 84.4%, respectively. There was a 1.5% gap between the self-report questionnaire results and urine cotinine levels in the assessment of non-smokers. Overall, among 148 students, there was a 14.9% gap for smokers, while there was no gap for secondhand smokers (32).

Moreover, Misalidi et al. conducted a study in 2013 to compare the results of a self-report questionnaire with hair nicotine levels for assessing SHS exposure. The sensitivity and specificity of the questionnaire were measured to be 64% and 74% for children and 69% and 64% for adults, respectively (17). This study developed a questionnaire based on the settings in which SHS exposure is probable. Also, Hosseini et al. compared a self-report questionnaire with urine cotinine analysis for assessing SHS exposure. The questionnaire, which contained 14 questions, was presented to 222 residents of Tehran, Iran, and its sensitivity and specificity were estimated as 90.12% and 98%, respectively. The agreement of the questionnaire with the cotinine level was 95.1% (21). Although the questionnaire included SHS questions, they did not describe the psychometric properties of designed tools.

In addition, Sasaki et al. compared the results of a self-report questionnaire with plasma cotinine levels for assessing SHS exposure in Japanese pregnant women. The sensitivity and specificity of the questionnaire were 68% and 63%, respectively (22). One of the reasons for the low sensitivity and specificity of their questionnaire might be the limited number of items for the assessment of SHS exposure. In the present study, different aspects of SHS exposure were considered to overcome this problem. Additionally, Vartiainen et al. compared the results of a self-report questionnaire with serum cotinine levels for assessing SHS exposure in a Finnish population. They assigned a 10 ng/mg cutoff point to differentiate smokers from non-smokers. Although the questionnaire included five items for this purpose, but it had inadequate sensitivity and specificity (33). It should be noted that they only had one cutoff point and had completely discarded secondhand smokers. In the present study, the confounding factors were excluded by only focusing on secondhand smokers.

Moreover, Ozoh et al. compared a self-report questionnaire with urine cotinine for assessing SHS

exposure in Nigerian truck drivers and reported the sensitivity and specificity of the questionnaire as 78% and 91%, respectively. One of the reasons for the low specificity of the questionnaire might be the use of only one cutoff point, which according to the researchers, cannot assess moderate and light secondhand smokers (34). In the present study, we tried to develop a tool to assess the lowest level of SHS exposure. Also, Conner et al. conducted a review study and evaluated studies comparing the results of self-report questionnaires with cotinine levels for assessing SHS exposure. Since there was the wide range of cotinine cutoff points (range, 8-100 ng/mg), the specificity and sensitivity of the tools varied widely between the studies. They also considered the specificity and sensitivity of the questionnaires to depend on the population and studied biomarkers (35). The tools designed in the present study are one of the few questionnaires that have good validity and reliability. We have gone through the standard steps for designing and psychometric properties of the questionnaire. The questionnaire determined SHS exposure and feelings toward dependency on nicotine and its scoring and interpreting is easy. In this study, the items of the SHS exposure questionnaire were extracted in a systematic review. For expanding the application of this tool, the sensitivity and specificity results need to be compared with the findings of laboratory studies. To decrease self-report limitations, the aim of the study was explained to the participants. They were encouraged to avoid unrealistic answers.

Implications for practice

The validated tool in the present study offers a reliable measure for assessing secondhand smoke (SHS) exposure, enhancing accuracy in clinical, community, and research settings. Nurses can use this tool to identify at-risk patients, implement evidence-based interventions, and promote smoke-free environments. This contributes to improved health outcomes and supports the goals of evidence-based nursing care.

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Conflicts of interest

There was no potential conflict of interest related to this article.

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Authors' Contributions

The conception, design of the study, and data collection process were undertaken by A. S. R.N was the supervisor who also contributed to the design of the study and reporting of the results. A.M. was the second supervisor who contributed to all the stages of the study. Analysis, interpretation, and reporting were supervised by A. M. All the authors contributed to the drafting and revising of the article and agreed with the final version of the manuscript to be submitted to the journal; they also met the criteria of authorship. All authors contributed equally in the preparation of this manuscript.

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