Accuracy of the Smoking Questionnaire (SQ)

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Introduction

Cigarette smoking is one of the most investigated risk factors in epidemiology. The definition and measurements of smoking exposure have not been standardized to date. The assessment of cumulative smoking exposure has been and is still being undertaken in a variety of ways. To address the heterogeneity of smoking exposure assessment, the smoking questionnaire (SQ) covering the major dimensions of cigarette smoking was developed (Weitkunat et al., 2013). The SQ comprises 8 items, 6 related to smoking behaviors and 2 related to past quitting. The SQ is consistent with the World Health Organization (WHO, 1998) criteria for defining smoking history and status (Weitkunat et al., 2013). Most importantly, it provides a basis for making smoking history assessment and results more comparable. It will be of considerable value in studies, in particular, where extremely detailed information on smoking exposure is not required and/or where smoking is not the main subject of the investigation.

The objective of the present work is to assess the accuracy of the SQ by evaluating the test-retest reliability of the SQ among current smokers. In addition, the content and the practicality of the SQ were assessed by the study participants.

Methods

The SQ was used in a randomized, controlled, open-label, 3-arm parallel group, multi-center study. Healthy male and female smokers aged at least 22 years were enrolled in the study. The SQ was self-administered at two distinct timepoints 6-days apart.

For the inter-temporal comparison, only subjects who completed the SQ at both timepoints (n=139) were included. The percent agreement and its 95% confidence interval (CI) were calculated. Reliability was classified, based on percent agreement, as poor (0-30%), modest (30-50%), moderate (50-70%) or high (70-100%). For the content assessment, a meta-questionnaire, containing 8 questions, was administrated directly after the SQ. The first question of the meta-questionnaire recorded the time spent to complete the SQ. The second to fifth questions addressed whether the SQ captured the smoking history and smoking behavior completely and correctly. The sixth to eighth questions collected information on the feasibility of the SQ. With the exception of question 1, which was completed by Investigator, the other meta-questions were self-administered.

Results

Table 1. Percent agreements and 95% CIs of the SQ by sex assessed at two different timepoints with an interval of 6 days.

SQ item	Description	n	% Agreement	95% CI
SQ1	Current smoking status	139	86.3	80.3 – 92.4
SQ2	100 cigarette lifetime	139	99.3	97.5 – 101.1
SQ3	Ever smoked regularly	139	98.6	96.2 – 100.9
SQ4	Age starting smoke	139	71.2	63.3 – 79.1
SQ5	Quitting period until now	0		
SQ6	Total ever quitting period	29	48.3	28.4 – 68.2
SQ7	Predominant brand	136	79.4	72.2 – 86.6
SQ8a	Daily manufactured cigarettes consumption			
	Last 3 month	136	68.4	60.2 – 76.6
	1 year ago	136	64.0	55.5 – 72.4
	5 year ago	137	54.7	46.0 – 63.4
	10 years ago	134	58.2	49.5 – 66.9
	15 years ago	131	69.5	61.2 – 77.7
	20 years ago	131	77.9	70.4 – 85.4
	>20 years ago	130	83.8	77.1 – 90.6
SQ8b	Daily hand-rolled cigarettes consumption			
	Last 3 month	119	96.6	93.0 – 100.3
	1 year ago	118	97.5	94.2 – 100.7
	5 year ago	117	99.1	97.0 – 101.2
	10 years ago	114	99.1	96.9 – 101.3
	15 years ago	113	99.1	96.9 – 101.3
	20 years ago	113	99.1	96.9 – 101.3
	>20 years ago	112	99.1	96.9 – 101.3
SQ8c	Daily cigar consumption			
	Last 3 month	118	98.3	95.6 – 101.1
	1 year ago	117	98.3	95.5 – 101.1
	5 year ago	117	98.3	95.5 – 100.1
	10 years ago	114	98.2	95.4 – 101.1
	15 years ago	113	99.1	96.9 – 101.3
	20 years ago	113	99.1	96.9 – 101.3
	>20 years ago	112	98.2	95.3 – 101.1
SQ8d	Daily pipes consumption			
	Last 3 month	118	99.2	97.1 – 101.2
	1 year ago	118	99.1	97.1 – 101.2
	5 year ago	118	99.1	97.1 – 101.2
	10 years ago	115	99.1	97.0 – 101.3
	15 years ago	114	99.1	97.0 – 101.3
	20 years ago	114	99.1	97.0 – 101.3
	>20 years ago	113	99.1	96.9 – 101.3

Reliability was high for almost all smoking behavior items (percent agreement 70-100%), in particular for the items of smoking status (SQ1), 100 cigarettes lifetime (SQ2), regular smoking (SQ3), age of initiation (SQ4), and preferred brand (SQ7).

Moderate reliability was found for daily consumption of manufactured cigarettes (SQ8a), in particular for the periods of the last 3 months to 10 years ago (percent agreement 55-68%). As very few subjects (n=7) used hand-rolled cigarettes, cigar or pipes, rather greater agreement was found for the inter-temporal comparison of the use of these tobacco products (SQ8b-d).

Based on the study design, all subjects were current smokers, but 22 subjects provided responses related to current quitting duration as ex-smokers (SQ5).

Of the 29 subjects who claimed to have ever quit (SQ6), 14 reported the same duration of quitting at both timepoints, while 15 provided discrepant durations. The percent agreement was 48%. The differences in quitting duration ranged from 2 days to 5 years.

Results

Table 2. Responses on meta-questions at two different timepoints with an interval of 6 days.

Meta-question	Description	Timepoint 1			Timepoint 2		
		n	Estimate	95% CI	n	Estimate	95% CI
Question 1	Completion time [Mean]	161	3.9	3.5 - 4.3	149	3.1	2.8 - 3.4
Question 2	SQ capture smoking behavior completely [%]	162	90.7	86.0 - 95.5	151	90.1	85.0 - 95.2
Question 3	SQ captures smoking behavior correctly [%]	162	95.7	92.2 - 99.1	151	93.4	89.1 - 97.7
Question 4	SQ captures smoking history completely [%]	162	92.0	87.5 - 96.5	151	90.1	85.0 - 95.2
Question 5	SQ captures smoking history correctly [%]	162	95.7	92.2 - 99.1	151	93.4	89.1 - 97.7
Question 6	SQ was self-explanatory [%]	162	97.5	94.8 - 100.2	151	96.7	93.5 - 99.9
Question 7	SQ was easy to use [%]	162	99.4	97.9 - 100.9	151	96.7	93.5 - 99.9

More than 90% of the subjects believed that the SQ captures the smoking history and behavior correctly. The majority of subjects (>97%) thought the SQ was self-explanatory and easy to use. The average SQ completion time was between 3.9 min (Timepoint 1) and 3.1 (Timepoint 2). Only 14 subjects provided comments, which were most frequently related to concerns regarding correct recall of relevant information.

Conclusions

Overall, the present work demonstrate that SQ is a reliable and practical tool of measuring smoking history. The SQ was found practical and easy to use.

As the types of tobacco/nicotine containing products are expanding rapidly, the SQ8 must be adapted accordingly to capture the relevant information.

REFERENCES

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