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Development and initial validation of a scale to measure attitudes and beliefs of pharmacists toward their work with patients

Razvoj i inicijalna validacija skale za ispitivanje opštih stavova i uverenja farmaceuta o sopstvenom radu sa pacijentima

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Abstract

Background/Aim. Studies on physicians and other health care professionals indicate that attitudes towards and beliefs in their work with patients, can affect the quality of health care, and patients' behaviour and compliance, thus an instrument is needed to survey pharmacists as healthcare providers. The aim of this study was to describe the development and psychometric validation of a survey instrument to assess attitudes and beliefs of pharmacists toward their work with patients (Pharmacists' Attitudes and Beliefs Scale, PABS). The aim of this research was to determine the reliability, validity and factor structure of a newly constructed instrument – PABS. **Methods.** The statements from the cognitive, affective, and behavioral areas were identified by literature review and selected to cover the behavior of pharmacists in providing pharmaceutical care at community settings. The initial 5-point Likert type scale of 30 items was constructed and after initial validation its revised form developed. The reliability, construct validity and factor structure of the scale were established. **Results.** The reliability of the scale was determined by the method of internal consistency, on a convenient sample of 123 community pharmacists. The Cronbach's alpha coefficient was 0.67. Factor analysis of principal components was performed and 7 factors with latent roots greater than 1 were extracted, explaining 64.92% of total variance, a single 30.84%, 8.20%, 6.55%, 5.63%, 5.01%, 4.68% and 4.01%. Based on the results of factor analysis in the development of the scale, some items in the scale were excluded (totally 7), so that the revised form of the PABS contained a total of 23 items. **Conclusion.** The initial PABS scale did not meet theoretical statistical criteria for reliability (Cronbach's alpha coefficient was < 0.7), but the findings indicated its potentially acceptable construct validity. The results support its use as a research tool to assess the behavior of pharmacists in daily practice, and provide its use as an indicator of quality in delivering pharmaceutical care.

Key words:
pharmacists; patients; serbia; questionnaires; sensitivity and specificity; patient satisfaction.

Apstrakt

Uvod/Cilj. Istraživanja na populaciji lekara i drugih zdravstvenih radnika pokazuju da stavovi i uverenja koja imaju o svom radu sa pacijentima, mogu uticati na kvalitet pružene zdravstvene zaštite, te se stoga nameće potreba da se ovo istraži i kod farmaceuta. Cilj ove studije bio je da se razvije skala za ispitivanje opštih stavova i uverenja farmaceuta o sopstvenom radu sa pacijentima (SOSUF) i da se ispitaju metrijske karakteristike ovog instrumenta. **Metode.** Izdvojene su tvrdnje iz kognitivne, afektivne i bihevioralne oblasti kojima je obuhvaćeno ponašanje farmaceuta prilikom pružanja farmaceutske zdravstvene zaštite u javnoj apoteci. Razvijena je inicijalna skala (SOSUF-i) kao 5-ostepena skala Likertovog tipa od 30 tvrdnji. Izvršena je validacija inicijalnog instrumenta utvrđivanjem pouzdanosti, validnosti i faktorske strukture skale i predložena nova razvijena verzija skale SOSUF. **Rezultati.** Na uzorku od 123 farmaceuta zaposlena u javnim apotekama sprovedena je validacija SOSUF-a. Pouzdanost je određena primenom metode unutrašnje konzistencije, Kronbah-ov koeficijent alfa iznosio je 0,67. Izvršena je faktorska analiza glavnih komponenti i dobijeno je sedam faktora sa latentnim korenima većim od 1, koji objašnjavaju 64,92% ukupne varijanse, a pojedinačno 30,84%, 8,20%, 6,55%, 5,63%, 5,01%, 4,68% i 4,01%. Na osnovu rezultata faktorske analize, a u sklopu razvoja skale, neke tvrdnje u skali izuzete su (ukupno 7), tako da razvijena verzija SOSUF-a sada sadrži ukupno 23 tvrdnje. **Zaključak.** Inicijalna skala SOSUF-i ne zadovoljava teorijske statističke kriterijume pouzdanosti (Kronbach-ov alfa koeficijent < 0,7), ali na osnovu rezultata može se pretpostaviti da efektivno meri stavove i uverenja farmaceuta o sopstvenom radu sa pacijentima. Rezultati merenja ukazuju na ponašanje farmaceuta u svakodnevnoj praksi kojim utiču na ponašanje pacijenata, i mogli bi se koristiti kao pokazatelj kvaliteta rada u pružanju farmaceutske zdravstvene zaštite na primarnom nivou.

Ključne reči:
farmaceuti; bolesnici; srbija; upitnici; osetljivost i specifičnost; bolesnik, zadovoljstvo.

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Introduction

Effective pharmaceutical care about patients sequires a high level of knowledge, communication skills for delivery and self-observation. When pharmacists interact with patients they should consider of any patients' reactions during the assessment process, when talking to the patients as well as counseling or reviewing patients' medication and clinical records [1–4]. For all health care professionals the delivery of health care is focused on the patients' therapeutic needs and should be supplemented by the behavior assessment process and quality assessment process. The behavior assessment process involves health professionals' assessment of patients' behavior, as well as their own behavior and attitudes in prevention, health promotion, improvement of pharmacotherapeutic measures and procedures in the rational use of medicines and certain types of medical devices [2]. Studies with health care professionals indicate that attitudes and beliefs they have about their work with patients, can affect the quality of health care which may result with better clinical/social/economic outcomes for health care consumers [5–13]. However, there is evidence that interaction with patients could result with problems that may put patients at risk produced by inadequate professional behavior [14–16]. To our knowledge, this has been very little explored in community pharmacy practice, and some published results with health care students [5] and professionals [5, 6, 8] show the necessity to construct specific instruments to assess attitudes and beliefs in each health care practice.

Development of scales measuring attitudes

Attitude is an important concept that is often used to understand and predict people's reaction to an object or change and how behavior can be influenced [17, 18]. It is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations it relates to.

Three generally accepted components of attitude are: cognitive component (knowledge, belief, opinion, information that anyone has about the subject of observation); affective component (like or dislike, expectations) and action component (expectation of future conduct) [17, 18].

Attitudes can be measured toward self or others, and it is easier to measure attitude than behavior [19]. Attitude scales attempt to determine individuals' believes, perceives or feels [20]. An attitude scale is a direct technique that consists of a series of affirmative or negative evaluative statements about the object position, in the form of claims. A total measure of a scale, that is the intensity of the paragraph, is a composite of responses to individual statements [18].

There are several types of scales that have been developed to measure attitudes and beliefs: generic ones including important forms of behavior in one area; specific ones including certain forms of behavior, which means that they are highly sensitive and specific for detecting characteristics and comparison of certain types of behaviors of different social or professional groups [21]; discriminatory which determine differences among subjects regarding certain forms of behavior; predictive that classify individuals in a particular category in relation to certain attitudes and behaviors [22, 23]. The Likert-type scale is the most widely used instrument for measuring attitude and it falls within the ordinal level of measurements. Categories range from completely negative attitudes, through neutral, to completely positive attitudes (agreements) in each individual item (usually 3 or 5 categories). Responses to all items are added and a total score is formed as a composite indicator that measures properties (summated scale) [21]. The most commonly reported psychometric properties of the scale as an instrument are reliability and validity which are the minimum requirements to be completed [24–28].

Although several scales [29, 30] have been developed to measure attitudes and beliefs of pharmacists and other healthcare workers towards specific groups of patients or specific subjects, less attention has been paid to the development of measures of their general attitudes and beliefs in everyday healthcare practice. To our knowledge, no scale exists currently to assess general attitudes and beliefs with regards to pharmacists own work as a whole. Furthermore, given the potential for negative attitudes, measures are needed to capture negative beliefs as well as professional behavior. To date, relatively little is known about the impact of behavior on the health care system, including how it may influence pharmaceutical care and health care. The development of a scale measuring attitudes and beliefs will facilitate studies investigating health care outcomes, patient reported outcomes and quality of health care provided, including the contribution of this type of research to behavioral aspects of delivering health care and pharmaceutical care in Serbia.

The overall objective of the research was to assess the attitudes and beliefs of pharmacists about their own work with patients in community pharmacies in Serbia. Specific research objectives were: construction of a new specific instrument for assessment of attitudes and beliefs of pharmacists towards their work as an of attitudes scale (PABS) and examination the PABS' psychometric properties *ie* reliability, construct validity and factor structure.

Official permission was to develop and test the instrument given from the Pharmaceutical Chamber of Serbia and all the pharmacists who participated were given a full explanation of the study and were garanteed anonymity. No financial compensation was given to any of the participants. The Ethics Committeee for Clinical Research of the University of Belgrade Faculty of Pharmacy approved the study as well.

Methods

This study was a part of an ongoing exploratory research project on social and behavioral insights into pharmacy practice under community settings in Serbia, which started in March 2010. This article reported the first stage process of that project (March 2010 – December 2011) documenting the development and initial validation of a new instrument (PABS) designed to assess attitudes and beliefs of pharmacists with regards to their own work with patients in everyday community practice in Serbia. The research was divided into two phases: scale development and initial vali-

dation. The development process began by reviewing the literature to generate items which refer to design, development and standardization of the scale for the assessment and monitoring of health workers' attitudes towards their own work with patients. Afterwards, the process of making the scale was conducted through the 3 groups of activities: defining criteria for scale structure and selection of appropriate measurement scale; determination of adequate sample of items within each of the content areas of specified domains and creation of the initial items pool; technical design of scale and way of its administration by the participants. The scale was multidimensional with each dimension representing a specific aspect of pharmacist's personal interaction with patients. For ease of construction and acceptable reliability each item of the summated (Likert) rating scale was used to represent each dimension. Item format was that traditionally used to measure attitudes and beliefs, constructed as statements of opinion with multiple response options to an agree/disagree continuum. Several points were considered under the construction process of the PABS: to cover a wide range of face to face interactions between pharmacists and patients within pharmacy service within primary health care; to make it suitable for self-administration and short in order not to be easy to answer; the items should be constructed so to increase the accuracy of responses (*ie*, to describe a specific conduct or attitude, rather than categories of events); to recognize individual differences in the perception of attitudes and beliefs of pharmacists through the inclusion of subjective reactions to the instrument; to avoid the position of arbitrator in determining the reality of events [31, 32].

In designing PABS' items the following criteria were taken into account: items should be formulated in terms most commonly used by respondents – pharmacists in primary health care system (pretesting was done); items should be derived from everyday situations and events from practice; sufficient level of items should be maintained in order to minimize subjectivity in response. Items should contain personal *vs* general referent, that is, they would focus on personal experience rather than on experience of people in general. For example, the item: "I believe that patients need to follow my instruction for usage of drug" was used instead of: "I believe that patients need to follow the instruction of pharmacist for usage of drug".

All claims were formulated as beliefs in certain aspects of pharmacist's own work with patients, with no terms that refer to emotional states. For each of the 30 items (affirmative or negative evaluative statements) respondents gave answers using the 5-degree Likert-type scale, ranging from "I do not agree at all" (1) to "I agree completely" (5). The survey instrument was pretested by 7 experienced pharmacy practice members to ensure that all the questions were understandable and then revised based on their comments. Those respondents did not participate in the study further on. A convenient sample of 250 pharmacists was included in the initial investigation of the psychometric properties of the instrument. The reliability of the scale was obtained by internal consistency and expressed with Cronbach's alpha coefficient. Internal consistency reliability defines the consistency of the results delivered in a test, ensuring that the various items measuring the different constructs deliver consistent scores. This type of reliability is obtained by a single usage application of the measuring instrument (PABS). Although in this case there is no data on temporal stability of the scale (PABS), there is data on homogenity and meaning of the internal consistency is probably the closest to the basic idea of reliability [32].

To determine the number and type of factors that underlie the scale items, principal component analysis and factor analysis was conducted.

Data collection was performed from October to December 2011. Respondents were asked to express their own views and to indicate in the scale the degrees to which they personally agreed or disagreed to the items. A total score for the scale was obtained by summing individual responses to the items so that the results could range from 30 to 150, with a higher score meaning a greater perceived advantage in working with patients. Sociodemographic questions were included in the PABS for collecting the information about age, gender, experience, location of work in terms of Pharmaceutical Chamber of Serbia Branch (only registered members of the Pharmaceutical Chamber of Serbia).

Retrieved and useable survey instruments were coded and the data were entered into a database. Statistical analysis was performed using the SPSS program (SPSS 18.0 for Windows, Inc., Chicago, IL, USA).

Results

The survey achieved a response rate of 49.2% (123/250). Of 123 pharmacists who completely filled questionnaire, the majority, 107 (87%), were females, at the beginning of their professional career, 6–10 years of professional practice (47.2%). Nearly half of the respondents were in big cities, 65 (52.8%), and almost equally in small towns, 58 (47.2%). Descriptive characteristics of the sample are presented in Table 1.

Table 1

Demographic characteristics of the study participants

Parameters	n (%)
Gender	
male	16 (13.0)
female	107 (87.0)
total	123 (100.0)
Age (years)	
> 30	22 (17.9)
31–40	58 (47.2)
41–50	26 (21.1)
51–60	14 (11.4)
< 60	3 (2.4)
Years of pharmacy service	
> 5	27 (22.0)
6–10	53 (43.1)
11–20	32 (26.0)
< 20	11 (8.9)
Total	123 (100.0)

After applying the PABS (the initial version given in Appendix 1), the reliability was determined by the method of internal consistency, Cronbach's alpha coefficient was 0.67.

To determine the number and type of factors that underlie the scale items, the factor analysis was conducted using principal components analysis. The validity of the scale items was determined by an overall score derived from the initial scale.

The matrix of variables intercorrelations was first analyzed using the principal components. Based on the number of latent roots (eigenvalue) which is grater than 1, it was determined that it can be explained by 7 factors with latent roots greater than 1, explaining respectively 30.84%, 8.20%, 6.55%, 5.63%, 5.01%, 4.68% and 4.01% of total variance, as shown in Table 2. The components from 8 to 30 explain less than 3% of the total variance.

To achieve a simple structure in which each variable should be as saturated as possible with a single factor, these 7 factors were then rotated for one of the methods of orthogonal rotation of factors, so called varimax rotation proposed by Kaiser [33]. Table 3 summarises the results of varimax rotation of the first seven factors. For each factor, high loadings (correlations) resulted in a few variables; the rest was near zero. Each factor has a small number of large loadings and a large number of zero (or small) loadings [34].

The results showed that the first factor (pharmacists' interaction with patients) consisted of the following items: education, anxious patients, reliance, motivation, demanding patients, lack of understanding. These items had the highest loading (saturation) of the factor.

Concerning the interpretation of factors, some items could also be of interest: errors, praise for the help, discontinuation of therapy.

Table 2

The total variance explained by principal component analysis

	Component initial eigenvalues of the scale			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total (%)	Variance	Cumulative (%)	Total (%)	Variance	Cumulative (%)	Total (%)	Variance	Cumulative (%)
1	9.253	30.843	30.843	9.253	30.843	30.843	4.010	13.366	13.366
2	2.459	8.196	39.039	2.459	8.196	39.039	3.193	10.644	24.010
3	1.966	6.552	45.591	1.966	6.552	45.591	2.872	9.574	33.585
4	1.688	5.626	51.217	1.688	5.626	51.217	2.818	9.394	42.979
5	1.503	5.010	56.226	1.503	5.010	56.226	2.545	8.485	51.464
6	1.403	4.678	60.905	1.403	4.678	60.905	2.306	7.686	59.149
7	1.204	4.013	64.918	1.204	4.013	64.918	1.731	5.768	64.918

Extraction method: Principal component analysis.

Table 3

Varimax solution for 7 principal components factors

Items in the scale	Featured factors						
	factor 1	factor 2	factor 3	factor 4	factor 5	factor 6	factor 7
Devoting time	0.010	0.366	0.432	0.394	-0.052	-0.128	-0.368
Courtesy	0.021	0.266	0.661	0.386	-0.150	-0.077	-0.289
Attentiveness	0.197	0.354	0.421	0.582	-0.012	-0.090	-0.106
Love for work	0.162	0.139	0.087	0.796	-0.219	-0.055	0.078
Information	0.315	0.180	0.101	0.614	-0.074	-0.329	0.122
Critique of patients	-0.164	-0.109	0.079	-0.378	0.361	0.474	0.196
Lack of understanding	-0.553	-0.187	-0.256	0.200	0.399	0.212	0.035
Praise	0.189	0.676	-0.005	0.114	-0.022	0.294	-0.197
Advice	0.076	0.776	0.146	0.151	0.114	-0.101	-0.026
Explanation	0.170	0.644	0.102	0.167	-0.197	-0.113	0.294
Instructions	0.288	0.512	0.355	0.137	-0.262	-0.176	0.320
Demanding patients	-0.580	-0.088	-0.098	-0.109	0.355	0.189	0.108
Understanding of patients	-0.020	-0.298	-0.157	-0.059	0.724	0.079	-0.013
Lack of understanding of drug	-0.363	0.009	-0.206	-0.168	0.563	0.320	0.064
Cooperation	0.384	0.277	0.652	-0.040	-0.010	-0.076	0.020
Discontinuation of therapy	-0.404	-0.438	0.100	-0.241	0.214	0.134	0.267
Satisfaction with service	0.257	0.487	0.327	0.051	-0.134	-0.087	0.316
Aggressive patients	-0.314	0.200	0.213	-0.185	0.684	-0.101	0.101
Anxious patients	-0.696	-0.055	0.052	-0.051	0.036	-0.129	0.103
Respect	0.014	0.130	-0.027	0.031	0.205	-0.034	0.750
Praise for the help	0.428	0.347	0.085	0.338	-0.036	-0.166	0.183
Motivation	0.614	0.268	0.460	0.168	0.079	-0.131	0.168
Reliance	0.674	0.178	0.276	0.327	-0.166	-0.206	0.088
Education	0.785	0.158	0.170	0.207	-0.078	0.026	0.074
Valuable time	0.156	0.181	-0.207	-0.409	0.329	-0.211	-0.546
Conflicts	0.020	-0.010	-0.008	-0.171	-0.077	0.799	-0.026
Non-compliance with advice	-0.195	-0.064	-0.214	-0.019	0.330	0.765	-0.007
Misunderstandings	0.083	-0.010	-0.461	-0.085	0.493	0.406	0.073
Compliance with the instructions	-0.151	0.044	-0.704	-0.121	0.069	-0.004	-0.188
Errors	0.456	0.282	0.189	0.494	0.053	-0.173	0.163
Scare of	30.843	8.196	6.552	5.626	5.010	4.678	4.013

The second factor (patient advised by pharmacists) consisted of the following items: advice, praise, explanation and instructions, and items that could also be of interest were: satisfaction with service and discontinuation of therapy.

The highest saturation of the third factor (kind and polite behavior) had the following items: compliance with the instructions, courtesy and cooperation, and of some importance may be the motivation.

The highest loading of the fourth factor (love/no love for the work) included the items: love for work, information, attentiveness, and of some importance may be the errors and valuable time.

The highest saturation of the fifth factor (understanding of patients) included the items: understanding of patients, aggressive patients and lack of understanding of drug and of a substantial nature may be misunderstandings.

The greatest saturation of the sixth factor (conflicts and misunderstandings with patients) was with the items: conflicts and non compliance with the advice and substantial nature may be critique of patients and misunderstandings.

The highest saturation of the seventh factor (pharmacists respect for their patients) had the variables: respect and valuable time. There were many correlations among extracted factors (Table 4).

Table 4

Intercorrelations of the extracted factors *,†

Extraction factors	1	2	3	4	5	6	7
1	0.541	0.440	0.409	0.413	-0.306	-0.283	0.046
2	0.027	0.512	0.142	0.026	0.657	0.433	0.313
3	-0.739	0.020	0.472	0.254	0.056	-0.362	0.178
4	-0.214	0.447	-0.050	0.008	0.087	-0.008	-0.863
5	-0.119	0.000	-0.587	0.794	0.019	0.071	0.072
6	0.159	0.101	-0.339	-0.177	0.464	-0.772	0.085
7	0.273	-0.577	0.356	0.321	0.500	0.014	-0.335

***Extraction method: Principal component analysis.**
†Rotation method: Varimax with Kaiser normalization.

Based on the results of factor analysis in the development of the scale, some claims were excluded in the scale (total 7), so that the final revised version of PABS contained a total of 23 claims. Items that were excluded from the initial version of the PABS are: 1) I'm not mistaken in working with patients; 2) Patients criticize me about working with them; 3) I have noticed that patients discontinue the therapy they had been prescribed; 4) The patients showed satisfaction with the service received from the pharmacist at the pharmacy; 5) I get compliments from patients about the received treatment; 6) In the process of interaction and patient misunderstandings arise related to the drug; 7) Patients spend a lot of time in work.

Discussion

To the best of our knowledge, this study is the first one to assess pharmacists' general attitudes and beliefs towards their work with patents using the self-completion scale constructed for pharmacists. There are, however, a great number of scales which measure pharmacists and other health care professionals' attitudes and beliefs towards patients, concordance and pharmaceutical care [10–12, 16, 35–39]. Our intention was to describe the process of development of the new instrument, whose potentional usefulness will be further tested and reported elsewere.

Reliability is one of the basic metric characteristics of testing or measuring instruments in general, and refers to the accuracy of measurements regardless of what is measured [27, 39–41]. When testing the reliability by using Cronbach's alpha coefficient, one should consider the statistical criteria of satisfactory and acceptable level of reliability. Reliability coefficient should be statistically significant at the 0.01 level. The statistical definition of the reliability coefficient indicates that a measurement error increases its value if it departs from the value 1.00 and *vice versa*. The coefficient of internal consistency is obtained on the basis of the intercorrelation of the items and it is interpreted as the coefficient of reliability. The size of this coefficient depends on the number of items and their correlation. It is a generally accepted standard that instruments (questionnaires, scales or tests) having Cronbach's alpha coefficient greater than 0.9 are considered very highly reliable, those with Cronbach's alpha coefficient above 0.8 are considered highly reliable, and above 0.7 have satisfactory reliability [35, 42, 43]. Since Cronbach's alpha coefficient was 0.67, we can say that the PABS did not meet the criteria for statistical reliability [35, 44].

The results of some studies on validation tools indicated unsatisfactory reliability of instruments whose Cronbach's alpha coefficient was < 0.7. These instruments were used either as an additional tool for the evaluation of phenomena, or as a part of the battery with the other scales [45–48].

The PABS was multidimensional scale with each dimension representing a specific aspect of pharmacist's personal interaction with patients, and built from items that were causal indicators. Therefore, it is unlikely that a high homogeneity could be achieved, because the content of items was different, and to different extent contribute to comprehensiveness of the phenomenon that is measured.

The scale contained several items which had low saturation factors, which reduced the average correlation between the items. Removing these items from the scale, was expected to increase Cronbah alpha coefficient for the developed version of the PABS.

Factor analysis of the results allows us to identify a small number of latent variables or factors that explain a set of correlations within existing group of manifest variables, which is one way to determine the construct validity of the scale (factor validity). That is equal to the proportion of the

factors that participate in the variance of the test results, that is equal to the saturation factor of the test individual or the individual psychological latent variable [35, 49].

We presented the significant variance between the factors (intercorrelations between the factors). This confirms the view that assertive, calm and polite behavior in dealing with patients improves and increases the patients' motivation, compliance and adherence. If pharmacists feel that patients do not take their precious time, they would adequately advise them so that patients would respect the pharmacists' information and advice and would probably not interrupt the ongoing therapy. If pharmacists love their job, it is more likely that working with patients will not create an impression that patients "take precious time", having more understanding for patients. Thus, fewer patients would be perceived as aggressive and pharmacists would not enter into conflict with them.

The findings of our research were similar to other studies conducted among health care workers. Scales designed to measure attitudes of health professionals according to different phenomena, in order to achieve adequate health care have shown adequate validity and reliability [50, 51].

A systematic review of 32 articles published from 1980 by 2008 dealing with validity and reliability of epidemiological questionnaires for measuring psychosocial and organizational factors at healthcare working practice among nurses, red to a conclusion that most questionnaires have good psychometric properties, but data are lacking on the predictive validity of these instruments [52, 53].

A study on creation of scales to measure attitudes of people in primary health care to dementia, showed satisfactory validity (Cronbach's alpha coefficient 0.83), and pointed to the possibility of using these instruments in study on attitudes of health professionals [47, 54]. The new developed psychometric scale to assess moral development and ethics for pharmacists in Australia [55] showed satisfactory validity according to the Cronbach's alpha coefficient of 0.75. Testing the level of job satisfaction on a sample of 1,600 physicians in Norway carried out by the Likert-type scale, showed a satisfactory reliability [56]. Factor analysis of an instrument to measure job satisfaction of health workers in providing health care, conducted in the USA on a sample of 328 respondents, identified three factors (reliability amounted to 0.74) [57].

Several limitations together with suggestions for future studies should also be noted. Due to a relatively small sample the research results might not be generalized to the entire population of pharmacists in primary care. For this purpose it is recommended to conduct research on a larger sample.

Because attitudes and beliefs are not always a steady state but sometimes are changeable psychological traits, retest was not performed in this research. So test-retest reliability remains unknown for this scale. It is suggested that test-retest reliability test be assessed in future studies to prove robustness of the scale (we suggest relatively short interval of no more than two weeks). However, the main purpose of the study was to develop a scale for further testing and this goal was achieved. Further study on a larges sample is suggested to confirm the robustness and to improve this instrument. Additionally, we consider that the limitations of the study, do not question the usefulness of this new instrument. The current version of the scale may at least be used as a prototype for further development of a similar scale to be used for other health care professionals, as well.

Conclusion

The findings of our study demonstrate the reliability and validity of the PABS, supporting its use as a research tool and to identify the factors associated with pharmacists, which could serve as potential predictors for assessing the quality of services provided by pharmacists when evaluating primary level health care services. Further research with a finally revised version of PABS (23-items scale) is needed concerning internal validity and reliability. Additionally, this instrument could be developed on a larger and heterogeneous sample of pharmacists.

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Appendix 1

Scale to measure pharmacists' attitudes and beliefs toward their work with patients (PABS)

Gender:

a) male

b) female

What is your age?

a) to 30

b) from 31 to 40

c) from 41 to 50

d) from 51 to 60

e) over 60

Your professional experience at pharmacy service is up to:

a) to 5 years

b) from 6 to 10 years

c) from 11 to 20 years

d) over 20 years

Which Branch of the Pharmaceutical Chamber of Serbia you belong to? _____

Dear fellow pharmacist,

The Instrument (Scale) in front of you is a part of a Research project on Social and Behavioral Insights of Pharmacy Practice in Community Settings in Serbia.

Your responses will be kept confidential and the findings will only be reported as group data in publications from the study. Your name will never be matched to your answers. The Instrument (Scale) takes 15 minutes to complete. Please respond to each item and do not skip any of the items. What is important in answering to this instrument is that you openly express your own views in term of agreement at the 5 point scale by circling the number offered: 1- not at all disagree, 2-mostly disagree, 3-disagree, 4-mostly agree, 5- I completely agree.

	do not agree at all	mostly disagree	disagree	mostly agree	I agree completely
I devote a lot of time in working with patients.	1	2	3	4	5
I am kind with patients.	1	2	3	4	5
While trying to be forthcoming in working with patients, they do not know how to appreciate it.	1	2	3	4	5
Although I love my job, I often find my work with patients very embarrassing.	1	2	3	4	5
Information provided to patients are very important for therapy.	1	2	3	4	5
Patients criticize me about working with them.	1	2	3	4	5
Patients do not understand what I say.	1	2	3	4	5
Every day I get compliments from patients related to my work with them.	1	2	3	4	5
Every day I offer an advice to patients.	1	2	3	4	5
When issuing a medicine I always provide instructions to patients on the drug therapy administration.	1	2	3	4	5
Patients understand my instructions regarding the routes of drug therapy administration.	1	2	3	4	5
Patients may be embarrassing.	1	2	3	4	5
I think I'm less understandable for patients.	1	2	3	4	5
Patients do not understand what I refer to regarding their drug application.	1	2	3	4	5
Patients co-operate with me regarding the treatment they were prescribed.	1	2	3	4	5
I have noticed that patients discontinue the therapy they were prescribed.	1	2	3	4	5
Patients are satisfied with service received from the pharmacist stuff.	1	2	3	4	5
I think that patients are more and more aggressive.	1	2	3	4	5
Patients are often impatient.	1	2	3	4	5
Patients refer unrespectfully to me.	1	2	3	4	5
I get compliments from patients about the treatment received.	1	2	3	4	5
I think that my ways of interaction with patients may affect their motivation.	1	2	3	4	5
Patients are increasingly relying on pharmacists regarding drug use.	1	2	3	4	5
Patients are interested to be well educated regarding medicines they use.	1	2	3	4	5
Patients take my precious time that I could use in a better way.	1	2	3	4	5
I'm daily engaged in conflicts with patients.	1	2	3	4	5
I think that patients do not want to listen to the advice I gave them.	1	2	3	4	5
In the process of interaction with patient misunderstandings arise related to drug use.	1	2	3	4	5
I believe that patients need to follow my drug instructions.	1	2	3	4	5
I'm not mistaken in working with patients.	1	2	3	4	5

Thank you for taking part in this Study!

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