Translation, Adaptation and Validation of the Youth Attitude to Noise Scale (YANS) Questionnaire Into Serbian Language

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Abstract

Context: Several language variations of YANS have been published. There is a rationale in grouping languages where one variation is usable for several countries. The people of four ex-Yugoslavian countries do speak practically one language whatever its present name. Aim: To make a Serbian version of YANS which would be usable in Serbia, Croatia, Bosnia and Herzegovina and Montenegro. Settings and Design: Translation and test-retest survey in a secondary school. Material and Methods: The translation process was performed according to the relevant guidelines through a standard procedure: English-Serbian-English-Consensus (people fluent in English)-Pilot assessment (20 students). The survey was performed in a Belgrade high school. Test YANS was completed by 244 students (response rate 98.8%, males 44%). Retest YANS was carried out among 60 randomly chosen students from the primary sample (response rate 96.7%, males 58%). In the statistical analysis we used the Olsen’s model of classification as well as previous validation of YANS. A reliability measure for analyzing survey items was Cronbach’s alpha. Determination of the mean differences between test and retest with respect to normal distribution of data was performed with the Student’s paired t-test. Results: Factor analysis between items grouped into four factors showed no significant association, except for a weak but negative one between two specific factors. The internal reliability (Cronbach’s alpha) was 0.721 and assessed as acceptable. The test-retest comparison did not reveal any significant differences. Mean overall YANS score was 2.76, which is higher than on testing in Sweden, very similar to the Brazilian one, and lower than in Belgium and China. Conclusion: Serbian version of YANS is a valid and reliable research instrument. It may also be used in Croatia, Bosnia and Herzegovina and Montenegro.

Keywords: Adolescent, noise, questionnaires, surveys

INTRODUCTION

The social activities that adolescents aspire to and the conditions in which they live are an acoustically challenging environment (sporting activities, going out, disco clubs, concerts, playing video games with loud sounds via headphones). On the other hand, a unique psychological developmental period also leads them to withdraw into their world, which is almost as a rule, followed by listening to loud music and other content with or without headphones, in order to at least partially satisfy the need for self-isolation.[1]

Adolescence is a period in which young people start making their own decisions about themselves, become aware of the possibility of a positive or negative impact on their own health and form attitudes towards it. Despite evidence of a detrimental effect of noise on health, increasing exposure of young people to noise is evident, which indicates the need for preventive measures.[2]

In order to implement preventive measures, it is necessary to become familiar with young people’s attitudes towards noise. In Serbia, there is no instrument that examines these views of young people, and it is therefore extremely useful to translate into Serbian and validate the existing Youth Attitude to Noise Scale (YANS), a questionnaire developed by Widen and Erlandsson.[3]
YANS was used among the youth population in Sweden,[3,4] Brazil,[5] USA,[4] Belgium[6] and China.[7] It consists of 19 questions with the answers given on a five-point Likert scale, graded from 1-totally disagree to 5-totally agree. However, it is well known that for a correct linguistic translation it is necessary to adapt a questionnaire culturally, to maintain the content validity. Furthermore, given that Serbs and other three people (Croatian, Bosnian and Montenegrin) in the region speak very similar, if not the same language (former Serbo-Croatian), the translation, adaptation and validation of this questionnaire would potentially have wider application and use in Croatia, Bosnia and Herzegovina and Montenegro. This would allow for better knowledge of the young people’s attitudes towards noise as well as comparability of the data. The aim of this study is to validate the YANS in Serbia. Comparative advantage of this study is that there is the highest possible linguistic closeness between Serbian, Croatian, Bosnian and Montenegrin languages.

**MATERIALS AND METHODS**

This study was approved by the Ethics Committee of the Faculty of Medicine, University of Belgrade, on 11/28/2019, Decision No. 1550/XI-38.

The need to use and validate YANS in Serbia is related to the investigation of the adolescents’ attitudes towards noise as a part of a broader study on tinnitus in adolescents.

Initially, we asked for and obtained the permission to translate and adapt the questionnaire from Erlandsson and Widen, the authors of the original YANS questionnaire.[3] The translation process was performed according to the relevant guidelines.[8] In the first step, the questionnaire was independently translated from English to Serbian by two colleagues fluent in English.

In the further translation process two other research team members, also fluent in English, agreed about the common version establishing a semantic equivalence. In the step three, two physicians with an excellent English proficiency performed a back translation from Serbian to English. And finally, a committee of four experts fluent in English reconciled differences and made the consensus on the pre-final version of the Serbian YANS.

To assess the time needed to complete the questionnaire, a preliminary study was conducted among 20 high school students of the third grade. The students were asked to suggest any ambiguity and to assess the clarity of the items from the questionnaire. The students made a few very useful remarks. For example, the word “dance” we had to replace by “party”, which means going to discos, clubs, cafes, concerts and other places where young people get exposed loud music. In that way, the final version of the Serbian YANS questionnaire was prepared and ready for validation [Annex 1].

**Survey process**

Before starting the study, a permission for this research was obtained from the Serbian Ministry of Education, Science and Technological Development. A gymnasium was randomly selected from the study sample of 17 schools. Both parental and personal informed consents were obtained for children under 18 years. Those older than 18 years signed an informed consent.

The research team members and the teachers distributed questionnaires in randomly chosen 12 classrooms from all four grades. The students were given 20 minutes to complete the questionnaire.

There were 247 questionnaires distributed. Three questionnaires were returned blank (the response rate = 98.8%; males 44%). After 21 days, a retest was distributed within a random sample of 60 participants (response rate 96.7%, males 58%).

**Statistical analysis**

After meticulously entering the data with double check of accuracy, a database was created in SPSS. Before the statistical process and analysis of the collected data was started there were modifications made to items 2, 5, 6, 8, 9, 10, 11, 14 and 17 from YANS. We changed the scoring direction (e.g. score 1 became score 5), such as Chinese authors did.[7] In order to establish the validity of the questionnaire, a confirmatory factor analysis was performed. We used Olsen’s model of classification as well as previous validation of YANS.[4,5,6,7] A reliability measure for analyzing survey items was Cronbach’s alpha. Determination of the mean differences between test and retest with respect to normal distribution of data was performed with the Student’s paired t-test. We constructed the Bland Altman plot to describe agreement between test and retest of Serbian YANS.

**RESULTS**

YANS showed satisfactory measurement characteristics. A factor analysis, using principal component methods with Varimax axis rotation, extracted a four-factor interpretable structure that explained the cumulative 47.7% of the total variance. KMO (Kaiser-Meyer-Olkin) test showed a very good value (0.798).

In order to check the correlation between the variables, a factor analysis was conducted whereby the questions were divided into four dimensions (F1, F2, F3 and F4) [Table 1].

The factors are arranged according to their explanatory potential. Factor 1 consists of questions 9, 12, 1 and 4 and refers to specific features of youth culture. Second factor (7, 19, 3, 18, 13, 15, 6) describes attitudes towards readiness to improve the sound environment. The third factor (17, 11,14,16,10, 8) consists of questions related to attitudes towards everyday noise and the fourth factor (2,5)
examined the ability to concentrate in a noisy environment. Only the association between F4 and F3 domains was statistically significant, but negative [Table 2].

We must bear in mind that the factor definition is represented by questions having the greatest factorial load, in other words, the higher the factorial load value, the greater is a question’s explanatory power.

The internal reliability of the questionnaire was checked by calculating the Cronbach’s alpha. It was 0.721 and assessed acceptable [Table 3].

A test-retest reliability was calculated with the paired sample \( t \)-test (\( t = 0.278; \ P\text{-value} = 0.782 \)) and didn’t reveal significant differences also shown in a Bland Altman plot [Figure 1].

Mean overall YANS score was 2.76 [Table 4], which is higher than on testing in Sweden (2.10)\(^{[3]} \) very similar to the Brazilian one (2.80)\(^{[5]} \) and lower than the Belgium (3.10)\(^{[9]} \) and China (3.46)\(^{[7]} \) ones.

Analyzing the factors in terms of gender [Table 4], significant difference was conspicuous between male and females in factor 2, suggesting that girls showed more readiness to improve the sound environment unlike males.

**DISCUSSION**

YANS is one of the few, if not the only valid research instrument that examines young people’s attitudes towards noise. The added value of the YANS is that it is adapted to younger ages where the risk of adverse effects of noise exposure is extremely high and the consequences may be serious and lasting.

Beside Sweden where YANS originally appeared, it was translated and used in USA, Brazil, China, and Belgium.\(^{[4,5,7,9]} \) This study provided a culturally adapted and validated Serbian version of YANS ready for use in further research in Serbia, Croatia, Bosnia and Herzegovina and Montenegro. The significant value of Cronbach’s and non-significant differences between test-retest result prove that Serbian YANS is a valid and a reliable instrument. In other words, there are only minimal differences in retesting which means that the test is not influenced by subjective factors. Serbian values of general index are similar to previous studies conducted in China (0.70)\(^{[7]} \) Brazil (0.75)\(^{[5]} \) USA (0.82)\(^{[4]} \).

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### Table 1: Factorial analysis to define the factors of the Serbian version of YANS

| Variables | F1     | F2     | F3     | F4     | Commonalities |
|-----------|--------|--------|--------|--------|---------------|
| Factor 1  |        |        |        |        |                |
| Question 9| 0.819  |        |        |        | 0.711         |
| Question 12| 0.817 |        |        |        | 0.705         |
| Question 1 | 0.800  |        |        |        | 0.667         |
| Question 4 | 0.778  |        |        |        | 0.673         |
| Factor 2  |        |        |        |        |                |
| Question 7 |        | 0.618  |        |        | 0.477         |
| Question 19|        | 0.588  |        |        | 0.396         |
| Question 3 |        | 0.579  |        |        | 0.473         |
| Question 18|        | 0.574  |        |        | 0.530         |
| Question 13|        | 0.550  |        |        | 0.386         |
| Question 15|        | 0.529  |        |        | 0.514         |
| Question 6 |        |        | 0.345  |        | 0.337         |
| Factor 3  |        |        |        |        |                |
| Question 17|        |        | 0.778  |        | 0.636         |
| Question 11|        |        | 0.704  |        | 0.573         |
| Question 14|        |        | 0.471  |        | 0.230         |
| Question 16|        |        | 0.372  |        | 0.314         |
| Question 10|        |        | 0.285  |        | 0.245         |
| Factor 4  |        |        |        |        |                |
| Question 2 |        |        |        | 0.739  | 0.553         |
| Question 5 |        |        |        | 0.620  | 0.462         |
| Explained variation | 3.398  | 2.392  | 1.845  | 1.439  |               |

### Table 2: Intra-factor and inter-factor correlations between the factors in the Serbian version of YANS

| Pearson correlations | F1     | F2     | F3     | F4     |
|----------------------|--------|--------|--------|--------|
| F1                   | -      | 0.485  | 0.244  | -0.079 |
| F2                   | -      | -      | 0.177  | -0.038 |
| F3                   | -      | -      | -      | -0.148 |
| F4                   | -      | -      | -      |        |
| Serbian YANS Total   | 0.783  | 0.759  | 0.585  | -0.337 |
Zhu et al.\cite{7} compared the differences in factor components between countries and noticed that there were certain items which were constant for the same factor domain internationally. Items 1, 4, 9 and 12 constantly belong to domain related to specific features of youth culture. Items 11 and 17 are in a domain of daily noises. Item 2 is related to the ability of mental concentration in noisy surroundings and item 3 is related to attitudes toward readiness to improve the sound environment. This item matches the same factorial domains in our study, as well. A diverse distribution of other items through the factorial domains probably depicts the specific cultural and social milieu of each country.

Factor 1 in our study has four items (1, 4, 9 and 12) and these questions belong to the same factor as it was demonstrated by Zhu et al.\cite{7} It is interesting that in factor 2, according to the claim in the questions about how it is not necessary to use earplugs in discos and other loud places, the extremely high responses score ($M=4.28$) indicate that awareness of the harmful effects of noise is very low among young people.

### Table 3: Cronbach’s alpha: F1, F2, F3, F4 in the Serbian version of YANS

|       | F1    | F2    | F3    | F4     | Serbian YANS Total |
|-------|-------|-------|-------|--------|-------------------|
| Cronbach’s alpha | 0.865 | 0.600 | 0.307 | 0.413  | 0.721             |

### Table 4: Factors in the Serbian version of YANS: (Mean and SD)

| Factor                                                                 | Gender   | Mean | SD  | t value | P-value |
|------------------------------------------------------------------------|----------|------|------|---------|---------|
| Attitudes related to specific features of youth culture                | Males    | 2.28 | 1.08 | −0.038  | 0.970   |
|                                                                        | Females  | 2.29 | 1.03 | −0.037  | 0.970   |
|                                                                        | Total    | 2.29 | 1.05 |         |         |
| Attitudes toward readiness to improve the sound environments            | Males    | 2.62 | 0.65 | −2.291  | 0.023   |
|                                                                        | Females  | 2.81 | 0.64 | −2.288  | 0.023   |
|                                                                        | Total    | 2.73 | 0.65 |         |         |
| Attitudes toward daily noises                                           | Males    | 2.63 | 0.53 | −1.388  | 0.166   |
|                                                                        | Females  | 2.73 | 0.58 | −1.405  | 0.166   |
|                                                                        | Total    | 2.68 | 0.56 |         |         |
| Attitudes toward ability to concentrate in noisy environments           | Males    | 2.84 | 1.04 | 0.292   | 0.771   |
|                                                                        | Females  | 2.80 | 1.14 | 0.295   | 0.768   |
|                                                                        | Total    | 2.82 | 1.09 |         |         |
| Serbian YANS – Total                                                    | Males    | 2.60 | 0.50 | −1.691  | 0.092   |
|                                                                        | Females  | 2.71 | 0.50 | −1.693  | 0.092   |
|                                                                        | Total    | 2.67 | 0.50 |         |         |

Figure 1: Bland Altman (difference) plot: mean of test and retest.
A comparison between YANS scores between five countries shows that in most cases more positive attitudes to noise are in China and the USA and the lowest scores are in Serbia [Table 5]. Although this finding may lead to a tentative estimate about a positive correlation between a country’s economic development and a youth attitude to noise, more research is needed on factors that influence differences in youth attitudes to noise worldwide.

CONCLUSION

Serbian version of YANS is a valid and reliable research instrument, Beside Serbia, it may also be used in Croatia, Bosnia and Herzegovina, and Montenegro [Annex 2]. It is also necessary to make young people aware of the harmfulness of noise and the need for self-protection.

Annex 1. Youth Attitude to Noise Scale (YANS)

1. I think that the sound level at discos, dances, rock concerts, and sporting events, in general, is too loud. (F1)
2. Listening to music while doing homework helps me concentrate. (F2)
3. I am prepared to do something to make the school environment quieter. (F4)
4. I consider leaving a disco, rock concert, dance or sporting event if the sound level is too loud. (F1)
5. I can concentrate even if there are many different sounds around me. (F2)
6. I think it is unnecessary to use earplugs when I am at a disco, rock concert, dance or sporting event. (F1)
7. It is important for me to make my sound environment more comfortable. (F4)
8. I don’t like when it is quiet around me. (F2)
9. The sound level at discos, dances, rock concerts or sporting events is not a problem. (F1)
10. Noise and loud sounds are natural parts of our society. (F1)
11. Traffic noise is not disturbing. (F3)
12. The sound level should be lowered at discos, rock concerts, dances or sporting events. (F1)
13. I think it should be quiet and calm in the classroom. (F4)
14. Sounds from fans, refrigerators, computers, etc., do not disturb me. (F3)
15. I am prepared to give up activities where the sound level is too loud. (F1)
16. The sound level at my school is comfortable. (F3)
17. It is easy for me to ignore traffic noise. (F3)
18. There should be more rules or regulations for the sound levels in society. (F1)
19. When I cannot get rid of sounds that bother me, I feel helpless. (F4)

Annex 2. Serbian version of YANS (Youth attitude to noise scale)

1. Smatram da je nivo zvuka u diskotekama, na žurkama, rok koncertima i sportskim dogadajima, generalno gledano, preglasan. (F1)
2. Slušanje muzike dok radim domaći pomaže mi da se koncentrišem. (F4)
3. Spreman/na sam da preduzmem nešto što bi školsku sredinu učinilo tišom. (F2)
4. Dode mi da napustim diskoteku, rok koncert, žurku ili sportski događaj ako je nivo zvuka preglasan. (F1)
5. Mogu da se koncentrišem čak i ako je oko mene mnogo različitih zvukova. (F4)
6. Smatram da nema potrebe da koristim čepove za uši kada sam u diskoteci, na rok koncertu, žurci ili sportskom događaju. (F2)
7. Važno mi je da zvuci oko mene budu prijatni. (F2)
8. Ne svira mi se kada je tišina oko mene. (F3)
9. Jačina zvuka u diskotekama, na žurkama, rok koncertima ili sportskim dogadajima, nije problem. (F1)
10. Buka i jaki zvuci su sastavni deo našeg društva. (F3)
11. Saobraćajna buka nije uznemiravajuća. (F3)
12. Treba smanjiti nivo zvuka u diskotekama, na rok koncertima, na žurkama ili sportskim dogadajima. (F1)
13. Smatram da u učionicima treba da bude mir i tišina. (F2)
14. Zvuci ventilatora, frižidera, kompjutera i sl. me ne uznemiravaju. (F3)
15. Spreman sam da odustanem od aktivnosti tamo gde je nivo zvuka preglasan. (F2)
16. Nivo zvuka u mojoj školi je prijatan. (F3)
17. Lako mi je da ignorisem saobraćajnu buku. (F3)
18. Trebalo bi da postoji više pravila i propisa u vezi nivoa zvuka u društvu. (F2)
19. Kada ne mogu da se otarim nekog zvuka koji mi smeta osećam se bespomoćno. (F2)

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Conflicts of interest

There are no conflicts of interest.

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