

Article

Psychometric Properties of the Serbian Version of the Operational and Organizational Police Stress Questionnaires

Filip Kukić ^{1,*} , Dane Subošić ² , Katie M. Heinrich ³ , Gianpiero Greco ^{4,5}  and Nenad Koropanovski ² ¹ Police Sports Education Center, Abu Dhabi Police, Abu Dhabi 253, United Arab Emirates² Department of Criminalistics, University of Criminal Investigation and Police Studies, 11080 Belgrade, Serbia; dane.subosic@kpu.edu.rs (D.S.); nenad.koropanovski@kpu.edu.rs (N.K.)³ Department of Kinesiology, Kansas State University, Manhattan, KS 66506, USA; kmhphd@ksu.edu⁴ Ministry of Interior, Public Security Department, State Police, 48160 Milan, Italy; gianpierogreco.phd@yahoo.com⁵ Department of Basic Medical Sciences, Neuroscience and Sense Organs, University of Study of Bari, 70121 Bari, Italy

* Correspondence: filip.kucic@gmail.com; Tel.: +971-(56)-4805956

Abstract: The Police Operational Stress Questionnaire (PSQ-Op) and Police Organizational Stress Questionnaire (PSQ-Org) have been used to assess operational and organizational sources of police officers' occupational stress. Considering that different cultural and socio-economic environments could affect officers' perception of operational and organizational stress, country specific psychometric properties and cut-off values should be defined. Therefore, this study aimed to investigate the psychometric properties of the Serbian version of the PSQ-Op and PSQ-Org (i.e., translated in Serbian and adjusted to Serbian culture) and to establish cut-off values for low, moderate and high stress. Methods: The PSQ-Op and PSQ-Org were administered to police officers through the Ministry of Interior of the Republic of Serbia. Participants included 1220 police officers (19.0% female) who correctly completed both questionnaires. Cronbach's α was used to determine the reliability of instruments. Cut-off values for low, moderate and high stress were defined based on the mean and standard deviation of the sample and using percentile analysis. Prevalence of low, moderate and high stress was calculated according to already established cut-off values as well as those calculated based on the study sample. Results: Both instruments showed high reliability (Cronbach's $\alpha = 0.963$ [95% Confidence Interval = 0.957–0.964]). Occupational stress levels (low, moderate and high) were distributed differently ($p < 0.001$) when categorized according to the cut-off values defined in literature and cut-off values based on the study sample. The cut-off values by mean and standard deviation could be used for PSQ-Op, while cut-off values by percentile analysis could be used for PSQ-Org.

Keywords: occupational stress; law enforcement; occupational health; stress assessment

Citation: Kukić, F.; Subošić, D.; Heinrich, K.M.; Greco, G.; Koropanovski, N. Psychometric Properties of the Serbian Version of the Operational and Organizational Police Stress Questionnaires. *Sustainability* **2021**, *13*, 13662. <https://doi.org/10.3390/su132413662>

Academic Editor: Giuseppe Battaglia

Received: 20 October 2021

Accepted: 8 December 2021

Published: 10 December 2021

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Policing is one of the main pillars of a stable society that ensures the implementation of law and order, and provides safety and security for all citizens. To play their role effectively, police officers need to perform a wide range of tasks, following precisely defined procedures and within a well-defined organizational structure [1]. Moreover, officers are often exposed to life-threatening job tasks, disagreements with colleagues and critiques by superior officers and the public. Accordingly, it is a stressful profession as sources of stress are originating from work content as well as the organizational job environment [2,3]. Operational content of police work includes, but is not limited to, work schedules, shift work, long work hours, court work and dangers to physical and psychological health; while the organizational environment refers to human elements that contribute to stress, such as bureaucracy and interpersonal interactions at work [4]. Furthermore, social-related stressor such as the difficulty of finding friends outside the job, not having time to spend

with friends and family, and uploading “higher” picture in public play significant role in occupational stress of police officers [5]. Therefore, sources of stress in policing jobs are layered and interrelated so officers are often experiencing stress while at work but also while off-duty [6–8].

Stress can decrease one’s ability to concentrate, shorten attention spans and lower the capacity to observe, which can lead to lower productivity [9]. For instance, a study on 25 police officers from Florida found significant memory differences (measured by Rey–Osterrieth Complex Figure test) between baseline values and after 10 days of police work [10]. In addition, the stressful nature of policing can adversely impact the psychological well-being and health of police officers [11–13]. On the other hand, the organizational structure may affect how police officers rate and categorize occupational stress. A study of 538 Turkish national police members demonstrated that officers who experienced their organization as stressful, had lower levels of job satisfaction and higher levels of burnout [14]. Authors also found that perceived operational stress was not associated with officers’ job satisfaction. This suggests that for job satisfaction, the work organization was more important than the nature of the work itself. Noting this is important because police agencies are typically success-oriented (i.e., keeping a safe and secure society), which is obtained through a vertically organized hierarchy and strict procedures [1]. Thus, to some degree, the success of the organization is attained at the expense of officers’ personal satisfaction.

Assessing the stress that police officers may experience whether due to operational requirements of the job or the organizational environment could provide directive as to how the agency might improve officers’ satisfaction. The Operational Police Stress Questionnaire (PSQ-Op) and Organizational Police Stress Questionnaire (PSQ-Org) are two commonly used measures of police stressors, both of which are helpful for elucidating individual variations in the perceptions of policing-specific stress (McCreary et al., 2017). Both instruments consist of 20 items, each of which represent stressors specific to policing jobs. They are easy to administer and do not take too long to be completed as officers only need to rate the intensity of each stressor. Numerous studies have shown good reliability and validity whether authors used administered them in English or translated them into the officers’ language of communication [7,13–17].

Although used internationally, only one study [13] defined cutoff-values that explained low, moderate and high perceived stress levels. However, other authors reported that they adjusted the instruments and translations to the cultural context in which officers that they investigated operated [14,17]. This is of importance as not every country uses the same organizational structure nor do socio-cultural and economic environments have the same effects on police officers. Furthermore, different crime rates may have an effect on operational and organizational stress levels. To that end, operational and organizational stress questionnaires should be adjusted to the officers’ culture and understanding for better reliability and construct validity of instruments. Afterwards, country-specific cutoff values should be calculated and checked against those already defined by McCreary et al. [13] who developed the PSQ-Op and PSQ-Org. If differences exist, the new cut-off values should be used; otherwise, international referent values could be a better choice. Establishing valid and reliable psychometric tools for the quick non-invasive evaluation of perceived occupational stress and their sources is important for police agencies as they could indicate early signs for mental overload and burnout of police officers. Precise cut-off values provide quantitative and qualitative indication of overall stress level in police officers to help direct efforts for mitigation and improvement.

The Republic of Serbia is a small Eastern-European country with one large police agency, the Ministry of Internal Affairs [1]. It has a strong centralized, vertically aligned hierarchical structure, which may affect how police officers perceive and organize occupational stress [5]. Although centralized vertical hierarchy may provide better control of the organization by the top of the chain of command, it limits officers’ abilities to take creative problem-solving action on their own [1]. This could cumulatively lead to frustration and a socially stressful work environment resulting in increased occupational stress. Well-defined

psychometric tools could play a significant preventive role in sustainable health, mental health, and wellbeing of police officers. Therefore, the primary aim of this study was to investigate the psychometric characteristics of PSQ-Op and PSQ-Org when translated in Serbian and adjusted to the Serbian culture. The secondary aim was to calculate cut-off values for perceived stress for Serbian police officers. It was hypothesized that the translated version of the PSQ-op and PSQ-org would show high validity and reliability in evaluation of police officers' occupational stress. It was also hypothesized that established cut-off values of occupational stress would differ from agency-specific cut-offs.

2. Materials and Methods

2.1. Experimental Approach to the Problem

An online communication system of the Ministry of the republic of Serbia was used to circulate the PSQ-op and PSQ-org to police officers from all organizational units of the Serbian police. All police officers in the Republic of Serbia were eligible to complete a survey. Participants responded from 14 of 15 organizational units, and 24 of 27 police directorates [1]. The sample included operational units of the Serbian police from all regions (Southern and Eastern Serbia, Western Serbia, North and Kosovo and Metohija) of Serbia. In total, 1259 officers opened the questionnaire. However, 30 officers rated each stressor from both questionnaires with the lowest grade only and nine with the highest grade only, so their data were excluded, leaving 1220 (females = 232 [19%]) for the analysis. Of the 1220, 84.7% were from operations and 15.3% were in managerial positions. The mean age of the sample was 39.1 ± 8.4 years. Before participants started answering the questions, they were informed about the aim of the data collection and required to answer whether they approve the utilization of their data for research purposes. They were not able to write their names, so the answers remained anonymous. The ethical board of the University of Criminal Investigation and Police Studies, Belgrade, Serbia, approved this study (approval 440-2).

2.2. Measurements and Procedures

Operational and Organizational Stress Assessment

The English versions of the PSQ-Op and PSQ-Org have been found to have satisfactory construct validity and reliability when used to assess participant occupational and organizational stress [2]. The PSQ-Op is comprised of 20 questions that evaluate the perceived stress of the nature of police work. The PSQ-Org is comprised of 20 questions that evaluate the perceived stress of the organization of police work (i.e., hierarchical structure, colleague relations, duty load distribution, etc.). On a 7-point Likert scale, the participants evaluated how stressful each item had been for them recently, with 1 being no stress and 7 very stressful. Scores are averaged across all 20 items to get a mean organizational stress score.

Items of both questionnaires were first translated into Serbian by authors. The English language expert checked the authenticity and accuracy of translation. Afterwards, the questionnaires went through a proofreading process by a Serbian language expert. Finally, the questionnaires in Serbian were reviewed by police experts to make sure that all items fit the context and culture of the Serbian police and that officers would not have difficulties understanding the individual items. We ensured that the questionnaires were adjusted to (i.e., not misunderstood by officers) the Serbian police organization and culture. This bears practical importance because the operational actions of police personnel from other agencies or nations may vary in terms of cultural conceptions and socioeconomic characteristics [7]. Translational adjustments did not exclude any original question but only ensured the meaning of each question was clearly understandable by officers. The original and Serbian version of the PSQ-Op and PSQ-Org are available in Supplement 1.

2.3. Statistical Analyses

The statistical analyses were conducted using Social Package for Social Sciences (IBM, SPSS statistics, version 23). Figures were produced using R stats version 4.1.0.

The descriptive statistics were calculated for the demographics questions and for each item of the PSQ-Op and PSQ-Org. The Kolmogorov-Smirnov test was used to determine the normality of the data distribution. Reliability analysis was used to determine the reliability of the instruments used and the changes in reliability if each item was dropped. Considering that the reliable measurement of the questionnaires could be influenced by the size of the sample, we conducted the reliability analysis on randomly selected subsamples of 10, 20, 30, 40, 50, 60, 70, 80 and 90% of the sample (Supplement 2). This also provided the stability of reliability indices. For the subsamples of 10–60%, we determined the reliability three times by randomly extracting three different subsamples of the same size. The average of three was reported. Explorative factor analysis was performed on 610 randomly selected participants to establish the component structure of extracted factors. To cross-validate this, the obtained factor structures were then used for a confirmatory factor analysis on the remaining 610 participants [3]. The significance level was set to $p < 0.05$. Cut-off values were calculated using the mean and standard deviation of PSQ-Op and PSQ-Org, and according to values belonging to the 1st, 2nd, and 3rd tertiles of the sample. Stress below the mean $-1.5 \times$ standard deviation was defined as low, stress above the mean $+1.5 \times$ standard deviation was defined as high stress and stress between the low and high was defined as moderate stress. Considering tertiles, low, moderate and high stress presented the lowest, middle and highest tertile, respectively. The frequency of officers who reported low, moderate and high stress was calculated according to cut-off values already established by McCreary et al. [13] and according to cut-off values calculated on this investigated sample. Pearson's χ^2 test was used to determine whether reported stress was differently distributed when evaluated by different cut-off calculations.

3. Results

Demographic characteristics of the sample are presented in Table 1. The majority of the sample were officers between 36–40 years of age who were raised and worked in the city. Furthermore, the most frequent level of education was high school, most of the officers were married, about three-quarters had children and non-smokers were more prevalent than smokers.

Table 1. Sample demographics.

Demographic Data	Frequency	Percent
Age distribution		
18–25	87	7.13
26–30	123	10.08
31–35	188	15.41
36–40	285	23.36
41–45	224	18.36
46–50	207	16.97
51 and older	106	8.69
Size of the place of birth		
Village	167	13.69
Town (<50 K people)	434	35.57
City (>50 K people)	619	50.74
Size of the place of employment		
Town up to 50 K people	314	25.74
City more than 50 K people	906	74.26
Level of education		
High school	672	55.08
College degree	156	12.79
University degree	392	32.13
Married		
Yes	878	71.97
No	342	28.03
Have children		
Yes	900	73.77
No	320	26.23
Smoker		
Yes	469	38.44
No	751	61.56

Descriptive and reliability statistics for each item of PSQ-Op and PSQ-Org are shown in Tables 2 and 3, respectively. The Kolmogorov-Smirnov test showed that the data were

not normally distributed. Frequency analysis found the Gaussian curve was tilted left as a higher number of officers tended to rate items lower, rather than higher. The reliability of both instruments was very high, with Cronbach's α being 0.961 for PSQ-Op (95% confidence interval = 0.957–0.964) and 0.959 for the PSQ-Org (95% confidence interval = 0.958–0.964). This value did not significantly change when individual items were dropped. The stability of reliability indices was also very high (see Table S2) for each item of PSQ-op (Cronbach α range from minimum to maximum was 0.955 to 0.963) and PSQ-org (Cronbach α range from minimum to maximum was 0.957 to 0.967).

Table 2. Descriptive and reliability statistics for the PSQ-Op.

Item	Parameters				K-S	Cronbach α If Item Dropped
	Mean	SD	Skew.	Kurt.	Z	
Shift work	3.2	1.8	0.509	−0.637	5.4 **	0.959
Working alone at night	3.9	2.2	0.115	−1.373	4.9 **	0.960
Over-time demands	3.9	2.1	0.139	−1.266	4.7 **	0.959
Risk of being injured on the job	3.2	1.9	0.554	−0.771	5.8 **	0.959
Work related activities on days off	3.6	2.0	0.316	−1.106	5.4 **	0.959
Traumatic events	4.1	2.0	0.001	−1.189	4.1 **	0.960
Managing your social life outside of work	3.1	1.9	0.648	−0.615	6.2 **	0.959
Not enough time available to spend with friends and family	3.9	1.9	0.146	−1.088	4.4 **	0.958
Paperwork	3.3	1.8	0.482	−0.742	5.5 **	0.959
Eating healthy at work	3.5	2.0	0.417	−1.044	5.5 **	0.959
Finding time to stay in good physical condition	3.2	1.9	0.549	−0.753	5.8 **	0.959
Fatigue	3.9	2.0	0.138	−1.128	4.5 **	0.957
Occupation-related health issues	3.8	2.1	0.149	−1.255	4.7 **	0.959
Lack of understanding from family and friends about your work	3.0	1.9	0.640	−0.715	6.6 **	0.959
Making friends outside the job	2.6	1.7	0.992	0.095	7.3 **	0.959
Upholding a "higher image" in public	2.6	1.7	0.980	0.027	7.9 **	0.959
Negative comments from the public	3.2	2.0	0.538	−0.927	6.1 **	0.959
Limitations to your social life	3.0	1.9	0.679	−0.695	6.7 **	0.958
Feeling like you are always on the job	3.4	2.1	0.454	−1.067	6.1 **	0.958
Stigma associated with your job	3.0	1.9	0.753	−0.525	7.0 **	0.958

Note: ** Significant at $p < 0.001$, Skew.—Skewness, Kurt.—Kurtosis, K-S—Kolmogorov-Smirnov test, SD—standard deviation.

Table 3. Descriptive and reliability statistics for the PSQ-Org.

Item	Parameters				K-S	Cronbach α if Item Dropped
	Mean	SD	Skew.	Kurt.	Z	
Dealing with co-workers	2.6	1.6	0.923	0.151	7.2 **	0.961
The feeling that different rules apply to different people	4.1	2.1	0.062	−1.280	4.7 **	0.959
Feeling like you always have to prove yourself to the organization	3.1	1.9	0.657	−0.705	6.3 **	0.959
Excessive administrative duties	3.8	2.1	0.192	−1.252	4.9 **	0.958
Constant changes in policy/legislation	3.9	2.0	0.134	−1.192	4.6 **	0.958
Staff shortages	4.3	2.0	−0.109	−1.238	4.7 **	0.959
Bureaucratic red tape	4.1	2.1	−0.043	−1.275	4.4 **	0.958
Too much computer work	3.8	2.0	0.187	−1.162	4.6 **	0.959
Lack of training on new equipment	3.3	1.9	0.546	−0.724	5.8 **	0.959
Perceived pressure to volunteer free time	3.6	2.1	0.302	−1.172	5.3 **	0.959
Dealing with supervisors	3.0	2.0	0.684	−0.707	6.6 **	0.959
Inconsistent leadership style	3.6	2.0	0.285	−1.100	4.8 **	0.958
Lack of resources	4.0	2.0	0.106	−1.182	4.6 **	0.959
Unequal sharing of work responsibilities	4.1	2.0	0.026	−1.222	4.4 **	0.958
If you are sick or injured your co-workers seem to look down on you	2.6	1.9	0.964	−0.217	8.5 **	0.960
Leaders over-emphasize the negatives	3.2	2.0	0.574	−0.912	6.4 **	0.959
Internal investigations	2.8	2.0	0.806	−0.597	7.7 **	0.960
Dealing with the court system	2.8	1.9	0.899	−0.307	7.5 **	0.960
The need to be accountable for doing your job	3.0	1.9	0.598	−0.790	6.2 **	0.960
Inadequate equipment	3.7	2.0	0.259	−1.136	4.8 **	0.959

Note: ** Significant at $p < 0.001$, Skew.—Skewness, Kurt.—Kurtosis, K-S—Kolmogorov-Smirnov test, SD—standard deviation.

Exploratory factor analysis extracted two significant components in both the PSQ-op and PSQ-org, explaining 60.3% ($X^2 = 9509.503$, $p < 0.001$) and 61.0% ($X^2 = 9932.852$, $p < 0.001$) of the variance, respectively. Kaiser-Meyer-Olkin (KMO) test showed an excellent overall sampling adequacy of 0.960 for the PSQ-op (KMO range = 0.935–0.986) and 0.959 for the PSQ-org (KMO range = 0.930–0.978). Confirmatory factor analysis provided a significant factor model for the PSQ-op ($X^2 = 1117.578$, $p < 0.001$) and PSQ-org ($X^2 = 1503.033$, $p < 0.001$).

Comparative fit indices were 0.900 and 0.865 for the PSQ-op and PSQ-org, respectively. The parameter estimates showed that all indices provided significant factor loadings for the PSQ-op (Table 4) and PSQ-org (Table 5).

Table 4. Confirmatory factor analysis parameter estimates for the PSQ-Op.

Indicator	Estimate	Std. Error	z-Value	p	95% Confidence Interval	
					Lower	Upper
Factor 1						
Shift work	1.40	0.07	21.58	<0.001	1.27	1.52
Working alone at night	1.50	0.08	18.68	<0.001	1.35	1.66
Over-time demands	1.60	0.07	21.74	<0.001	1.45	1.74
Risk of being injured on the job	1.29	0.07	18.57	<0.001	1.15	1.42
Work related activities on days off	1.42	0.07	20.21	<0.001	1.29	1.56
Traumatic events	1.23	0.07	17.52	<0.001	1.10	1.37
Managing your social life outside of work	1.42	0.07	21.65	<0.001	1.29	1.55
Not enough time available to spend with friends and family	1.53	0.06	24.05	<0.001	1.41	1.66
Paperwork	1.31	0.06	20.64	<0.001	1.18	1.43
Eating healthy at work	1.43	0.07	19.95	<0.001	1.29	1.57
Finding time to stay in good physical condition	1.37	0.07	20.54	<0.001	1.24	1.50
Fatigue	1.74	0.06	27.91	<0.001	1.62	1.86
Occupation-related health issues	1.63	0.07	23.27	<0.001	1.49	1.76
Factor 2						
Lack of understanding from family and friends about your work	1.49	0.06	23.35	<0.001	1.37	1.62
Making friends outside the job	1.42	0.06	24.44	<0.001	1.30	1.53
Upholding a "higher image" in public	1.47	0.06	25.24	<0.001	1.36	1.59
Negative comments from the public	1.59	0.07	23.15	<0.001	1.46	1.72
Limitations to your social life	1.55	0.06	24.21	<0.001	1.42	1.67
Feeling like you are always on the job	1.67	0.07	24.46	<0.001	1.54	1.81
Stigma associated with your job	1.62	0.06	26.77	<0.001	1.50	1.73

Table 5. Confirmatory factor analysis parameter estimates for the PSQ-Org.

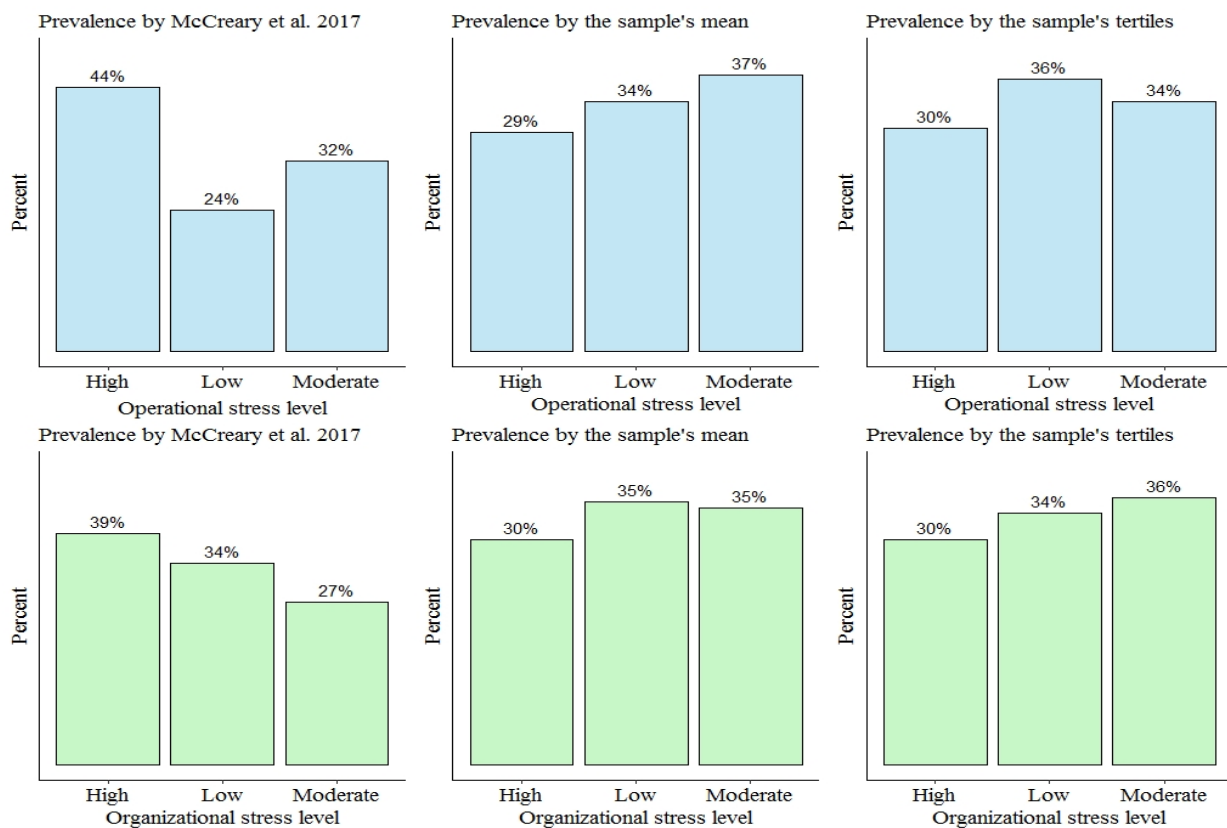
Indicator	Estimate	Std. Error	z-Value	p	95% Confidence Interval	
					Lower	Upper
Factor 1						
The feeling that different rules apply to different people	1.58	0.07	22.02	<0.001	1.44	1.72
Feeling like you always have to prove yourself to the organization	1.67	0.07	24.29	<0.001	1.54	1.81
Excessive administrative duties	1.74	0.07	25.91	<0.001	1.60	1.87
Constant changes in policy/legislation	1.67	0.07	24.67	<0.001	1.53	1.80
Staff shortages	1.76	0.07	26.37	<0.001	1.63	1.89
Bureaucratic red tape	1.53	0.07	22.20	<0.001	1.39	1.66
Too much computer work	1.31	0.07	19.86	<0.001	1.18	1.44
Lack of resources	1.63	0.07	24.20	<0.001	1.50	1.76
Unequal sharing of work responsibilities	1.70	0.07	24.84	<0.001	1.56	1.83
Inadequate equipment	1.53	0.07	21.84	<0.001	1.40	1.67
Factor 2						
Dealing with co-workers	1.04	0.06	17.39	<0.001	0.92	1.16
Feeling like you always have to prove yourself to the organization	1.54	0.07	23.11	<0.001	1.41	1.67
Eating healthy at work	1.53	0.07	20.56	<0.001	1.38	1.67
Finding time to stay in good physical condition	1.59	0.07	24.52	<0.001	1.46	1.72
Fatigue	1.64	0.07	23.73	<0.001	1.50	1.77
If you are sick or injured your co-workers seem to look down on you	1.31	0.07	19.19	<0.001	1.17	1.44
Leaders over-emphasize the negatives	1.67	0.07	24.57	<0.001	1.53	1.80
Internal investigations	1.40	0.07	19.81	<0.001	1.26	1.54
Dealing with the court system	1.34	0.07	19.83	<0.001	1.21	1.47
The need to be accountable for doing your job	1.33	0.07	18.78	<0.001	1.19	1.47

Descriptive statistics for the mean PSQ-Op and PSQ-Org, as well as cut-off values calculated from the mean and percentile analysis are shown in Table 6. The cut-off value for low PSQ-Op was somewhat higher when calculated from the mean and standard deviation compared to the value belonging to the low tertile of the sample. In contrast, the cut-off value for high stress was larger when using the mean than when using the percentile allocation to the high tertile. Considering the PSQ-Org, cut-off values for low stress were the same by mean value and percentile analysis, while the cut-off for high stress was somewhat larger by tertile analysis.

Table 6. Descriptive statistics and cut-off values for the PSQ-Op and PSQ-Org.

Statistics	Operational Stress	Stress Level	Organizational Stress	Stress Level
Mean \pm Std. dev.	3.36 \pm 1.47	Low < 2.7 Moderate = 2.7–4.2 High > 4.2	3.45 \pm 1.49	Low = < 2.6 Moderate = 2.6–4.1 High > 4.1
Percentiles	33rd = 2.5 67th = 4.0	Low < 2.5 Moderate = 2.5–4.0 High > 4.0	33rd = 2.6 67th = 4.2	Low < 2.6 Moderate = 2.6–4.2 High > 4.2

The prevalence of officers reporting high, moderate or low stress according to the three different calculations of cut-off values showed the highest prevalence of high operational stress and lowest prevalence of low operational stress when calculated by values provided by McCreary et al. (2017) (Figure 1). The prevalence of high organizational stress was also the highest when calculated by McCreary et al. (2017) compared to the prevalence calculated from our study sample mean and tertiles. The prevalence of low stress was similar regardless of which of the three cut-off calculations were used, while the prevalence of moderate organizational stress was the lowest according to the McCreary et al. (2017) cut-offs. The difference in distributions in operational stress obtained from McCreary et al. (2017) and from the sample's mean and tertiles were statistically significant (for mean, $\chi^2 = 1229.64$, $p < 0.001$ and for tertiles, $\chi^2 = 1156.40$, $p < 0.001$). The difference in distributions in organizational stress were also statistically significant (for mean, $\chi^2 = 1840.36$, $p < 0.001$ and for tertiles, $\chi^2 = 1942.07$, $p < 0.001$).

**Figure 1.** Prevalence of operational and organizational stress levels according to three different calculations of cut-off values.

4. Discussion

The main finding of this research showed high reliability as well as the stability of reliability indices for the Serbian version of the PSQ-Op and PSQ-Org. Moreover, cross-

validation analysis showed that the Serbian version of PSQ-op and PSQ-org provided a high validity construct for evaluation of occupational stress. These results allowed for the calculation of national standards for the evaluation of operational and organizational police stress. This was further confirmed by significant differences in the distribution of officers when evaluated based on sample characteristics or on previously established data, thus providing construct validity to the Serbian version of the PSQ-Op and PSQ-Org. Therefore, the Serbian version of the PSQ-Op and PSQ-Org could be considered reliable and valid for the evaluation of occupational stress of Serbian police officers. Accordingly, newly calculated cut-off values could be adopted for the evaluation of the level of occupational stress as well as for a timely screening of trends in occupational stress of Serbian police officers.

The reliability results of the PSQ-Op and PSQ-Org in this study showed a higher Cronbach's α than in McCreary et al. [13] who reported a Cronbach's α of 0.93 and 0.92 for the PSQ-Op and PSQ-Org, respectively. The reliability in both instruments was also higher than the Cronbach's α of 0.93 and 0.94 for the PSQ-Op and PSQ-Org, respectively, reported by Irniza et al. [16]. Kula et al. [14] reported the Cronbach's α of 0.895 and 0.828 for the PSQ-Op and PSQ-Org, respectively, which was lower than in our study. Comparing to results reported by Sagar et al. [17] (Cronbach's $\alpha = 0.80$), larger reliability occurred in the PSQ-Org of this study. Recently, Fayyad et al. [7] reported a Cronbach α of 0.793 on Arabic version of the PSQ-Op, which was lower than the value from this study. In addition, by calculating reliability on random subsamples of 10–90% of the sample we found that the stability of reliability indices were also very high, providing further evidence for the reliable utilization of both instruments. Considering this, the reliability of both instruments in this study was the highest, providing strong evidence that the Serbian versions of the PSQ-Op and PSQ-Org are reliable instruments for evaluation of operational and organizational stress in Serbian police. In a technological era, when all employees can access the questionnaires or the questionnaires could be delivered to them, having a reliable and yet convenient instrument for occasional evaluation of occupational stress could be highly useful for the country's police agency. As practices, policies, leadership, socioeconomic environment change the PSQ-op and PSQ-Org could be used to evaluate from various angles if the changes have an impact on occupational stress. Even more so, the instruments could be used on smaller samples of officers, which may allow individual police stations to evaluate the stress levels of their officers, as well as a comparison between individual police stations.

Exploratory and confirmatory factor analysis showed that the PSQ-op and PSQ-org are valid constructs, providing the evidence for both internal and external validity. Recent research on occupational stress from three different countries used principal component analysis to define the operational stress structure of police officers [5]. Authors found that operational stressors grouped into more work-related and social-related stressors. Similarly, the stress indices that fed Factor 1 and Factor 2 of PSQ-op in our study could be named work-related and social related. Considering PSQ-org, the stress indices in Factor 1 and Factor 2 seem also to be grouped into those more related to work and those more related to social interaction. This is the first study that cross-validated instruments developed by McCreary et al. [2] and as such, these results bear high value. We showed that the PSQ-op and PSQ-org could be adjusted and used in a different language. In addition, although this study's aim was to investigate psychometric properties of two instruments, it also provides the evidence for the validity of the construct of work-related and social-related occupational stress factors. With the PSQ-op and PSQ-org as valid and reliable instruments, occupational stress could be investigated in longitudinal studies, which would provide insight into the effects of various demographic characteristics and processes on police officer occupational stress.

The next important information for evaluation of occupational stress are standards to which the stress level could be compared. Although one study reported cut-off values for low, moderate and high stress [13], the sample of that study consisted of police officers from one socio-cultural and economic environment as well as from one type of job organization, all of which could have an effect on stress of police officers. This firstly reflects in differences

in mean operational stress and organizational stress between the studies from different countries. For instance, mean PSQ-Op and PSQ-Org values from this study were lower than in McCreary and Thompson [2] who reported mean values of 3.47 and 3.80 for the PSQ-Op and PSQ-Org, respectively. Furthermore, the mean PSQ-Op score from our study was somewhat higher, while the mean PSQ-Org was somewhat lower than in McCreary et al. [13] who reported means of 3.26 and 3.55 for the PSQ-Op and PSQ-Org, respectively. In addition, Fayyad et al. [7] reported a mean PSQ-Op of 2.84 on a sample of Lebanese police officers, which was lower than in the present sample. Considering this, it is evident that operational stress varies between agencies and cross-culturally. To that end, we calculated cut-off values for the Serbian police.

Significant differences in the prevalence of officers with low, moderate, and high stress when evaluated by previously established cut-off values by McCreary et al. [13] and by newly developed cut-off values on our Serbian sample provides the evidence for developing national cut-off values. In this study, we calculated cut-off values using two statistical approaches. Firstly, we used the sample's mean and standard deviation and then we divided the sample into three equal percentile groups using 33rd and 67th percentile (i.e., 1st, 2nd and 3rd tertile). Two approaches were used so the whole sample was correctly represented because the distribution of officers in each stress level was not normal. Using only mean and standard deviation, although they represented the majority of the data, tended to move the cut-off values towards the skewed side of data distribution. The mean and standard deviation approach provided the direct distribution of perceived occupational stress (i.e., subjective stress). However, if the objectively measured stress did not correspond to subjectively perceived stress, this approach might under or overestimate occupational stress level. On the other hand, the tertile approach allocated officers into three equal groups based on the sample size, maximum and minimum reported values. This approach was able to adjust the cut-off values when the data were skewed to one side. There were small differences in cut-off values as well as in the prevalence of officers reporting low, moderate and high stress when evaluated by the mean value approach and by the tertile approach, providing additional evidence for the reliability, consistency and construct validity of the instruments. Given the shape of distributions of operational and organizational stress levels by each method of calculating cut-offs, it could be suggested that the mean and standard deviation approach could be used for PSQ-Op and percentile approach for the PSQ-Org.

Limitations

Although this study included a representative sample of the Serbian police, additional data should be collected for women officers, as their perceptions of stress might differ from men. We were unable to examine differences between genders due to unequal sample sizes. This is cross-sectional snapshot of Serbian police and more regularly collected data could further strengthen the findings of this study.

5. Conclusions

This study determined the reliability and validity of the Serbian version of the PSQ-Op and PSQ-Org, two instruments that provide insight into occupational stress of police officers. Furthermore, national cut-off values for operational and occupational stress were developed for Serbian police on the representative sample of police officers. Both the PSQ-op and PSQ-org were found to be reliable and valid instruments when translated into Serbian language. Both instruments seem to be valid constructs for the evaluation of occupational stress in Serbia. Cut-off values calculated from the mean and standard deviation could be used for the PSQ-Op, while cut-off values calculated from percentile could be used for PSQ-Org as they best describe the prevalence of stress levels. Information on operational and occupational stress could be valuable for the police organization as a whole, as well as for the station or department leaders to act expediently if an issue of operational or organizational nature arises. Instruments could be distributed in printed

form or online for to quickly complete. Cut-off values could be used to inform the agency, station department or an individual about the meaning of their stress perceptions and provide validity to stressors experienced by the officers. Policies and interventions could be shaped to mitigate negative effects of occupational stress that are both work and social related. In addition, knowing whether the stress is caused by social or work stressors provides the foundation for more focused actions, which in return could also reduce the economic spending on health, mental health and wellbeing of officers. Implementation of regular assessment via the PSQs would provide a human-centered approach to organizing work environments and a sustainable evaluation of subjective perceptions of stress for each officer.

Supplementary Materials: The following are available online at <https://www.mdpi.com/article/10.3390/su132413662/s1>, Table S1: Operational Police Stress Questionnaire (Upitnik o profesionalnom stresu policajaca). Table S2: Organisational Police Stress Questionnaire (Upitnik o stresu policajaca na poslu). Table S3: Reliability of PSQ-op for randomly chosen 10, 20, 30, 40, 50, 60, 70, 80, and 90% of the sample. Table S4: Reliability of PSQ-op for randomly chosen 10, 20, 30, 40, 50, 60, 70, 80, and 90% of the sample.

Author Contributions: Conceptualization, F.K. and N.K.; methodology, F.K.; formal analysis, F.K.; investigation, F.K., N.K., K.M.H.; resources, G.G. and D.S.; data curation, N.K. and D.S.; writing—original draft preparation, F.K. and N.K.; writing—review and editing, F.K., K.M.H., G.G., N.K., D.S.; visualization, F.K.; project administration, D.S. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki, the ethical board of the University of Criminal Investigation and Police Studies, Belgrade, Serbia, approved the study (approval 440-2).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data is available upon request. Contact info: filip.kucic@gmail.com.

Acknowledgments: We want to thank Milan Srecković, who prepared the questionnaires in electronic form, posted on the UCIPS online platform, and Olivera Jezdimirović, who gave valuable English translation suggestions to Serbian language.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Kekić, D.; Kukić, F.; Milenković, M. Ministry of Internal Affairs and Police Organization in the Republic of Serbia. In *Global Perspectives in Policing and Law Enforcement*; Policing perspectives and challenges in the Twenty-First century: Lexington, KY, USA, 2021; ISBN 978-1-79363-724-6.
2. McCreary, D.R.; Thompson, M.M. Development of Two Reliable and Valid Measures of Stressors in Policing: The Operational and Organizational Police Stress Questionnaires. *Int. J. Stress Manag.* **2006**, *13*, 494–518. [[CrossRef](#)]
3. Peñalba, V.; McGuire, H.; Leite, J.R. Psychosocial Interventions for Prevention of Psychological Disorders in Law Enforcement Officers. *Cochrane Database Syst. Rev.* **2008**, *16*, CD005601. [[CrossRef](#)]
4. Shane, J.M. Organizational Stressors and Police Performance. *J. Crim. Justice* **2010**, *38*, 807–818. [[CrossRef](#)]
5. Kukić, F.; Streetman, A.; Koropanovski, N.; Čopić, N.; Fayyad, F.A.; Gurevich, K.; Zaborova, V.; Krikheli, N.; Dopsaj, M.; Heinrich, K.M. Operational Stress of Police Officers: A Cross-Sectional Study in Three Countries with Centralized, Hierarchical Organization. *Polic. J. Policy Pract.* **2021**, paab065. [[CrossRef](#)]
6. Deschamps, F.; Paganon-Badinier, I.; Marchand, A.-C.; Merle, C. Sources and Assessment of Occupational Stress in the Police. *J. Occup. Health* **2003**, *45*, 358–364. [[CrossRef](#)] [[PubMed](#)]
7. Fayyad, F.A.; Kukić, F.V.; Čopić, N.; Koropanovski, N.; Dopsaj, M. Factorial Analysis of Stress Factors among the Sample of Lebanese Police Officers. *Polic. Int. J.* **2020**, *44*, 332–342. [[CrossRef](#)]
8. Greco, G.; Fischetti, F. Physical, Technical and Tactical Training and Stress Management in Law Enforcement. *J. Phys. Educ. Sport* **2018**, *18*, 555–560.
9. Wright, T.A.; Cropanzano, R. Psychological Well-Being and Job Satisfaction as Predictors of Job Performance. *J. Occup. Health Psychol.* **2000**, *5*, 84–94. [[CrossRef](#)] [[PubMed](#)]

10. Gutshall, C.L.; Hampton, D.P., Jr.; Sebetan, I.M.; Stein, P.C.; Broxtermann, T.J. The Effects of Occupational Stress on Cognitive Performance in Police Officers. *Police Pract. Res.* **2017**, *18*, 463–477. [[CrossRef](#)]
11. Andersen, J.; Papazoglou, K.; Arnetz, B.; Collins, P. Mental Preparedness as a Pathway to Police Resilience and Optimal Functioning in the Line of Duty. *Int. J. Emerg. Ment. Health Hum. Resil.* **2015**, *17*, 624–627. [[CrossRef](#)]
12. Garbarino, S.; Magnavita, N. Work Stress and Metabolic Syndrome in Police Officers. A Prospective Study. *PLoS ONE* **2015**, *10*, e0144318. [[CrossRef](#)]
13. McCreary, D.R.; Fong, I.; Groll, D.L. Measuring Policing Stress Meaningfully: Establishing Norms and Cut-off Values for the Operational and Organizational Police Stress Questionnaires. *Police Pract. Res.* **2017**, *18*, 612–623. [[CrossRef](#)]
14. Kula, S. Occupational Stress, Supervisor Support, Job Satisfaction, and Work-Related Burnout: Perceptions of Turkish National Police (TNP) Members. *Police Pract. Res.* **2017**, *18*, 146–159. [[CrossRef](#)]
15. Acquadro Maran, D.; Zedda, M.; Varetto, A. Organizational and Occupational Stressors, Their Consequences and Coping Strategies: A Questionnaire Survey among Italian Patrol Police Officers. *Int. J. Environ. Res. Public Health* **2018**, *15*, 166. [[CrossRef](#)] [[PubMed](#)]
16. Irniza, R.; Emilia, Z.A.; Muhammad Saliluddin, S.; Nizam Isha, A.S. A Psychometric Properties of the Malay-Version Police Stress Questionnaire. *Malays. J. Med. Sci.* **2014**, *21*, 42–50. [[PubMed](#)]
17. Sagar, M.H.; Karim, A.R.; Nigar, N. Psychometric Properties of the Bangla Version Operational Police Stress Questionnaire. *J. Indian Acad. Appl. Psychol.* **2015**, *41*, 242–250.