Psychiatr. Pol. 2018; 52(3): 499–510
PL ISSN 0033-2674 (PRINT), ISSN 2391-5854 (ONLINE)
www.psychiatriapolska.pl
DOI: https://doi.org/10.12740/PP/OnlineFirst/69218

The Polish adaptation of the Life Events Checklist (LEC-5) for PTSD criteria from DSM-5

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Summary

Aim. The aim of the study was the Polish adaptation of the Life Events Checklist (LEC-5), which is used to assess individual's traumatic events exposure for posttraumatic stress disorder (PTSD) criteria from DSM-5.

Methods. The study was conducted on 172 students of the University of Finance and Management in Warsaw, i.e., 68 women and 104 men, at the age between 17 and 49 (M = 22.74; SD = 6.80). Reliability of LEC-5 was measured by the absolute stability method. Two repeated measurements with two week interval were conducted on the sample of 40 students of the University of Finance and Management. Validity of LEC-5 was checked by the correlational analysis between the LEC-5 scales and the PTSD Diagnostic Scale for DSM-5 (PDS-5) and the Impact of Events Scale (IES) on the whole 172 sample of students.

Results. The magnitude of interclass correlation coefficients for all LEC-5 scales and high values of Cohen's kappa coefficients proved a high reliability of this tool. Significant correlations between all LEC-5 scales and PDS-5 and IES scales were also obtained, which proved satisfactory validity of LEC-5.

Conclusions. Obtained empirical results proved satisfying psychometric properties of LEC-5.

Key words: traumatic events; posttraumatic stress disorder (PTSD); LEC-5 – Polish version.

Introduction

Exposure to traumatic events is the first (A) and essential criterion for posttraumatic stress disorder (PTSD) diagnosis. The definitions of traumatic stressor have been changed several times starting from 1980 [1], which was caused by the new empirical facts. Epidemiological studies proved that approx. 56%–90% of respondents declare exposure to at least one traumatic event in their life [2, 3].

It is worth mentioning that the extension of criterion A in DSM-IV has led to the significant increase of the prevalence of traumatic events in empirical studies [4]. According to DSM-IV, traumatic event is related to "experiencing, witnessing, or being confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or close relatives and when at the same time the person's response involves intense fear, helplessness, or horror (…)" ([5], p. 427–428). On the other hand, subjective reaction to trauma is very important (A2). Compared to DSM-IV, the traumatic stressor criteria in DSM-5 [6] are very specific. For example, sexual assault and repeated exposure to traumatic events associated with individual profession, e.g., emergency officers, is explicitly highlighted. Conversely, DSM-5 eliminated A2 criterion, as empirical studies did not prove its suitability as a PTSD risk factor.

LEC-5 [7] is based on previously constructed tool, i.e., the Life Events Checklist (LEC), which is used to assess individuals' traumatic events exposure according to DSM-IV criteria. LEC was constructed in the US National Center for Posttraumatic Stress Disorder parallel with structured interview for PTSD diagnosis: Clinician Administered PTSD Scale for DSM-IV (CAPS) [8], which is considered as a gold standard for PTSD assessment. Initially, LEC was intended to be used before CAPS. The authors of a publication on LEC's psychometric properties [9] underline LEC's unique feature: LEC measures various types of exposure to potentially traumatic event (PTE). For each traumatic event respondents rate their experience on 5 point nominal scale (1 = happened to me; 2 = witnessed it; 3 = learned about it; 4 = not sure; 5 = doesn't apply). In this way, there is a possibility to gather specific information about PTE, which could not be obtained using other trauma measurements. The authors of LEC mention that, for instance, being a victim of serious physical assault or transportation accident, during which a person experienced serious injuries can be potentially traumatizing, but "unnoticed" by other PTE measurements. In addition, specific research questions may aim to compare people with various types of traumatic exposure (i.e., witnessed it vs. learned about specific PTE). In other cases researches or clinicians may be interested not only in the highest traumatic exposure intensity (i.e., direct exposure), but also in other types of trauma exposure, when they need to gather data about various ways of traumatic exposure in case of the same PTE. LEC enables researchers and clinicians measurement of both, aforementioned, types of data.

LEC's psychometric properties were obtained in two studies [9]. In the first study, conducted on 108 students, temporal stability and internal consistency with other PTE measurement (TLEQ) were evaluated. Satisfactory temporal stability after 7 days was achieved, in respect to particular items, as well as the global score. Kappa values were

analyzed for dichotomized items (happened to me vs. all other traumatic exposures), as well as for not dichotomized items. Out of 17 items, 12 had kappa coefficients = 40 or more. In the second study participated 131 war veterans, who took part in a clinical diagnosis in NCPTSD in Boston. The majority of them (70.8%) were Vietnam war veterans. In this study following psychometric tools were used to check internal consistency: the Mississippi Scale, PCL-M, CAPS, BDI and BAI. LEC correlated significantly with all, aforementioned measurements.

According to Gray et al. [9], detailed analysis of results obtained in both studies proved "LEC's satisfactory psychometric properties", which means not only temporal stability after one week in comparison to other measures of PTE in respect to the global score in LEC, but also in respect to all particular items in this tool. The differentiation according to kappa values is similar compared to other studies, where PTE has been assessed [10, 11]. It deals with particular situation, when LEC is used to measure direct trauma exposure (i.e., examining temporal stability with reference to traumatic events, which a person experienced directly), which is the most often used screening application of PTE tools. LEC and LEC-5 have similar layout. In both cases LEC lists 17 traumatic events, the same in both versions of LEC. Respondents rate the way they experience PTE. In LEC-5 there is additional way of PTE experience: "part of my job", as a consequence of A criterion's change in DSM-5 [6]: "experience of repetitive or extreme exposure to aversive details of traumatic events".

There are three LEC-5 formats [12]: (1) Standard self-report – used for screening for PTE; (2) Extended self-report – used for evaluating the worst traumatic event, when a person experienced a trauma more than once; (3) *Interview* – used for checking whether A criterion was achieved. In our study we present empirical results on Polish adaptation of the first LEC-5 format: standard self-report.

In this study we expected statistically significant positive correlations between the number and the intensity of PTSD symptoms and the number of events experienced by participants and the number of events witnessed by participants. However, we expected that the number and the magnitude of correlation coefficients between the number and the intensity of PTSD symptoms and the number of traumatic events directly experienced by participants will be higher than the number and the magnitude of correlation coefficients between the number and the intensity of PTSD symptoms and the number of traumatic events which participants only witnessed. We did not expect statistically significant correlation coefficients between the number of traumatic events about which participants learned and the number and the intensity of PTSD symptoms.

Materials and method

Participants

In our study participated 172 students of the University of Finance and Management in Warsaw. In particular, there were 68 women and 104 men, aged between 17 and 49 ($M = 22.74$; $SD = 6.80$). The reliability of LEC-5 was measured by test-retest method. The second assessment was conducted after 2 weeks from the first assess-

ment on the sample of 40 students of the University of Finance and Management in Warsaw. LEC-5 validity was measured by correlational analysis between LEC-5 scales and PDS-5 scales and IES scales on the sample of 172 students. The vast majority of participants – 151 respondents (87.8%) – were married. 18 respondents were single (10.5%). Two respondents were divorced and one respondent was a widower. The majority of participants ha secondary education – 169 persons (98.3%); only 3 people had higher education.

Tools

Validity of LEC-5 was assessed with the use of PDS-5 and IES. Polish version of the Posttraumatic Diagnostic Scale for DSM-5 (PDS-5) consists of a list of traumatic events and 20 items evaluating symptoms of PTSD, according to the DSM-5 criteria, as well as two items assessing the intensity of distress experienced by respondents, the level of influence the symptoms have on everyday life, and two items referring to the symptoms onset and duration [13]. In this study participants refer to the list of traumatic events in LEC-5 (to one most distressing traumatic event) while answering PDS-5 items. PTSD symptoms are scored on a 5-point scale indicating how frequently symptoms have been happening and how much they upset the subject during the preceding month (0 = not at all; 1 = once a week or less/a little; 2 = 2 to 3 times a week/somewhat; 3 = 4 to 5 times a week/very much; 4 = 6 or more times a week/severe). For PDS-5 indicators the number of PTSD symptoms and the number of points as an indicator of symptoms severity, were calculated. PDS-5 has satisfactory psychometric characteristics [13]. Cronbach's alpha reliability coefficient in the present sample was also satisfactory (see, Table 2).

The Impact Event Scale (IES) is a frequently used questionnaire to assess PTSD symptoms related to intrusions and avoidance in many countries [14]. IES consists of 15 items describing PTSD symptoms from these two categories. The intensity of each PTSD symptom, assessed 7 days before the exact study, is assessed on 0–5 scale, where 0 mans "none", and 5 means "often". In this study participants also refer to the list of traumatic events in LEC-5 (to one most distressing traumatic event) while answering IES items. IES has satisfactory psychometric properties [14]. Cronbach's alpha reliability coefficient in our sample was also satisfactory (see, Table 2).

Prevalence of traumatic events in the study sample

In Table 1 we present frequency distribution for the number of traumatic events, which participants experienced directly, witnessed them or learned about them.

Table 1. **Frequency distribution – traumatic events in the LEC-5 questionnaire, regardless they were experienced directly, witnessed or learned about**

Traumatic event	n	%
Natural disaster	6	3.5

table continued on the next page

Fire or explosion	8	4.7
Transportation accident	30	17.4
Serious accident at work, home, or during recreational activity	12	7.0
Exposure to toxic substance	2	1.2
Physical assault	18	10.5
Assault with a weapon	1	0.6
Sexual assault	5	2.9
Other unwanted or uncomfortable sexual experience	2	1.2
Combat or exposure to a war-zone	4	2.3
Captivity	1	0.6
Life-threatening illness or injury	11	6.4
Severe human suffering	6	3.5
Sudden violent death	9	5.2
Sudden accidental death	14	8.1
Serious injury, harm, or death you caused to someone else	6	3.5
Any other very stressful event or experience	15	8.7
No traumatic events	22	12.8
Total	172	100

Note: *n* – number of persons; % – percentage of the sample size.

The most prevalent traumatic event was a transportation accident. The prevalence of PTSD according to DMS-5 diagnostic criteria was assessed using PDS-5 questionnaire. In order to assess the clinical cut-off of PTSD level, we used IES questionnaire. 7 participants (4.1%) fulfilled all PTSD diagnostic criteria according to DSM-5. The results of 56 participants (32.6%) were equal to or exceeded the threshold value of 35 pts in the general PTSD score in the IES questionnaire. 30 participants (17.4%) exceeded the cut-off point of 44 pts.

Results

In the first step of the Polish adaptation of LEC-5, after obtaining authorization of LEC authors form the National Centre for PTSD in the US, four translators (including three authors of this study) translated LEC-5 from English to Polish. Afterwards, another translator, working both at the Faculty of Psychology, University of Warsaw and in the US, conducted back-translation procedure. Finally, we managed to reach a final version of LEC-5, which was accepted by the authors from the National Centre for PTSD in the US.

Descriptive statistics

LEC-5 questionnaire enables assessment of several types of PTE on three scales, i.e., the number of PTE which were directly experienced by a person, the number of PTE which were witnessed by a respondent and the number of PTE about which a respondent learned. Table 2 presents descriptive statistics for these scales and for scales of the IES and PDS-5 questionnaires. Table 2 also presents Cronbach's alphas for the used measurements. IBM SPSS 24 statistical package was used to conduct the statistical analysis [15].

Table 2. **Descriptive statistics for the analyzed variables**

Questionnaire	Scale	M	SD	min.	max.	α
LEC-5	Number of experienced events	1.91	2.04	0	15	-
	Number of events witnessed by the respondent	2.27	1.97	0	10	-
	Number of events that the respondent has learned about	2.95	2.97	0	12	-
IES	Intrusions	12.38	8.07	0	33	0.82
	Avoidance	14.92	9.46	0	36	0.84
	General IES score	27.31	16.37	0	67	0.90
PDS-5	Number of symptoms from B criterion	2.79	1.70	0	5	0.74
	Number of symptoms from C criterion	0.97	0.84	0	2	0.67
	Number of symptoms from D criterion	3.92	2.01	0	7	0.71
	Number of symptoms from E criterion	3.65	1.79	0	6	0.67
	General number of PTSD symptoms	11.34	4.76	0	20	0.84
	Intensity of symptoms from B criterion	4.31	3.59	0	23	0.75
	Intensity of symptoms from C criterion	1.73	1.85	0	8	0.72
	Intensity of symptoms from D criterion	6.46	4.56	0	21	0.79
	Intensity of symptoms from E criterion	5.96	3.60	0	19	0.68
	General intensity of PTSD symptoms	18.46	10.93	0	63	0.88

Note: *M* – mean; *SD* – standard deviation; min. – minimal value; max. –maximal value; α – Cronbach's alpha.

Reliability

Reliability was checked using the test-retest method. There were two assessments with a two-weeks time break, conducted on the sample of 40 students of the University of Finance and Management in Warsaw. Table 3 presents the values of intra-class correlation coefficients.

Table 3. **Interclass correlation coefficients**

Scale	R
Number of experienced events	0.944***
Number of events witnessed by the respondent	0.933***
Number of events that the respondent has learned about	0.946***

Note: *** $p < 0.001$.

The values obtained for all of the scales mean very high temporal stability of the measurement.

Table 4 includes the values of Cohen's kappa between particular items of the Polish adaptation of LEC-5 in two consecutive measurements. Aforementioned coefficients were obtained for each particular item (from "happened to me" to "doesn't apply") and for the dichotomized scales (only direct exposition to a traumatic event or lack of direct exposition).

Table 4. **Measure of agreement values (Cohen's kappa) between individual positions of LEC-5 adaptation in two successive measurements**

Traumatic event	Dichotomous scale	Full scale
Natural disaster	1.00	1.00
Fire or explosion	0.89	0.90
Transportation accident	0.95	0.94
Serious accident at work, home, or during recreational activity	0.61	0.65
Exposure to toxic substance	0.79	0.84

Validity

Validity was assessed using the correlational analysis between LEC-5 scales and PSD-5 and IES scales. Taking into account the ordinary character of variables on LEC-5, we used Kendall's tau correlation coefficients. The values of correlation coefficients are presented in Table 5.

Table 5. **Values of Kendall's τ correlations between the results on the LEC-5 scales and the results on the PDS-5 and IES scales.**

Scale	The number of events experienced	The number of events witnessed by the respondent	Number of events that the respondent has learned about
Number of symptoms from B criterion	0.156**	0.156**	0.047
Number of symptoms from C criterion	0.045	0.108	0.031

table continued on the next page

Number of symptoms from D criterion	0.083	-0.008	0.004
Number of symptoms from E criterion	0.076	0.018	0.061
General number of PTSD symptoms	0.117*	0.066	0.024
Intensity of symptoms from B criterion	0.206**	0.154**	0.009
Intensity of symptoms from C criterion	0.118	0.144*	0.062
Intensity of symptoms from D criterion	0.157**	0.047	0.006
Intensity of symptoms from E criterion	0.145*	0.064	0.053
General intensity of PTSD symptoms	0.187**	0.105	0.009
Intrusions	0.209**	0.099	0.077
Avoidance	0.214**	0.148**	0.064
General IES score	0.224**	0.130*	0.076

Note: * $p < 0.05$; ** $p < 0.01$.

We obtained statistically significant, positive correlations between the numbers of traumatic events, directly experienced by participants and the number of PTSD symptoms form the B criterion, the number of the general PTSD score symptoms, as well as between the intensity of PTSD symptoms from the B, D and E criterion, the general intensity of PTSD symptoms, and the level of intrusions, avoidance and the general PTSD score in the IES questionnaire. The number of positive correlations between the numbers of traumatic events only witnessed by participants, was smaller and deals only with the number and the intensity of PTSD symptoms from the B criterion, the intensity of PTSD symptoms from the C criterion, the level of intrusions and the general PTSD score in the IES questionnaire. It is important to mention the fact that the general intensity of PTSD symptoms correlated positively only with the number of traumatic events which participants experienced directly and the magnitude of correlations between the general PTSD score in the IES questionnaire and the number of traumatic events, which participants experienced directly, was stronger than the magnitude of correlations between the general PTSD score in the IES questionnaire and the number of traumatic events which participants only witnessed. We did not notice statistically significant correlations between the number of traumatic events about which participants learned and the number and the intensity of PTSD. Aforementioned correlations proved satisfactory validity of the Polish adaptation of LEC-5.

We also conducted logistic regression analysis where LEC-5 scales were analyzed as predictors of PTSD diagnosis according to DSM-5 PTSD criteria diagnosed with

the use of PDS-5 questionnaire. The analysis was based on bootstrap method with the 1000 samples. The values of regression coefficients were statistically insignificant. The values were $B = 0.16$, $p = 0.09$ for number of traumatic events which participants experienced directly, $B = 0.210$, $p = 0.06$, for number of traumatic events which participants only witnessed and $B = –0.03$, $p > 0.05$ for number of traumatic events about which participants learned. It is important, however, to notice that the values obtained for number of traumatic events which participants experienced directly and for number of traumatic events which participants only witnessed were close to statistical significance and that only 4.1% of participants met all DSM-5 diagnostic criteria for PTSD. It severely constrained statistical power applied to examining associations between LEC-5 scores and PTSD diagnosis.

Recapitulation

Our study proved a high level of reliability of the Polish adaptation of LEC-5. The second measurement after two weeks on the sample of 40 students demonstrated high temporal stability of our tool. For all scales Cohen's kappa exceeded 0.60. These results are higher than those obtained by Gray et al. [9] for LEC, where the mean Cohen's kappa value for all items was 0.61. The value of test-retest coefficient amounted to $r = 0.82$ ($p < 0.01$). In some cases, very low rates (e.g., serious injury, injury or death of another person caused by you) were reported in the study by Gray et al. [9]. The authors indicated that it was a result of a small number of indications for this item (6 out of 104 respondents). Perhaps higher level of reliability in our study compared to the study by Gray et al. may be related to more legible instruction for respondents and the answer format including exposure to trauma related to respondents' occupation ("e.g., paramedic, police, army or other emergency services").

The validity of the Polish adaptation of LEC-5 also occurred to be satisfactory. Particularly, Kendall's tau correlation coefficients between the number of traumatic events experienced directly by participants and the intensity of PTSD in PDS-5 were: 0.187 ($p < 0.01$) and 0.224 ($p < 0.01$) for the general PTSD score in the IES questionnaire. Moreover, correlational analysis indicated that the general PTSD intensity (PDS-5 measurement) correlated only with the number of traumatic events experienced directly by respondents and the magnitude of correlations between the general PTSD score in the IES questionnaire and the number of traumatic events, which participants experienced directly, was stronger than the magnitude of correlations between the general PTSD score in the IES questionnaire and the number of traumatic events which participants only witnessed. We did not notice statistically significant correlations between the number of traumatic events about which participants learned and the number and the intensity of PTSD. In the study by Grey et al. [9] validity was assessed on sample of students and with the use of following tools: TLEQ [10], PTSD Checklist (PCL) and Modified PTSD Symptom Scale (MPSS). With regard to theoretically linked measures of PTSD symptoms, the obtained Parsons's r correlation coefficients between LEC and the general score in all of aforementioned tools were 0.44 ($p < 0.1$) and 0.48 ($p < 0.1$) respectively. While comparing these results it is worth mentioning

that the Polish version of PDS-5 has not been entirely adopted psychometric tool yet. Zawadzki et al. [13] presented only factor structure of PTSD, conducted with the use of confirmatory factor analysis. These authors obtained very high level of PTSD in a non-clinical sample of 388 participants (41.5%), however, with the exclusion of F criterion. In our study 7 respondents (4.1%) fulfilled all PTSD criteria according to DSM-5. On the other hand, 56 participants (32.6%) exceeded the threshold value of 35 pts in the general PTSD score in IES questionnaire. 30 participants (17.4%) exceeded the cut-off point of 44 pts. This range of results should be taken into account in future studies on the prevalence of PTSD in Poland, as new studies proved the prevalence of PTSD symptoms among Polish samples, which have not been yet commonly associated with PTSD [16]. Regardless of the above, the LEC-5 adaptation presented here satisfactorily fulfills the standards of psychometric properties.

With regard to PTSD diagnosis it is worth to mention some criticism about LEC as a tool for PTE screening. Gray et al. [9] indicated that LEC encompasses a broad range of PTE. All psychometric tools used for PTE screening have similar items, but each of these tools contains also very specific items, which are not covered by other tools. In LEC there are items describing exposure to toxic substance, fire and explosion. On the other hand, there are no detailed items concerning PTE mentioned by TLEQ [10] and SLEQ [11], such as intimate partner violence or abuse in the childhood. Furthermore, researchers and clinicians should be aware of potentially false positive results, which stem from the answer layout in LEC. Witnessing or learning about traumatic events may fulfill A1 criterion from DSM-IV only if it relates to close friend or a close relative. As a consequence, rating particular item in LEC should not mean, that respondent is traumatized. LEC should be treated as a preliminary screening tool, and researchers and clinicians should additionally include other information about PTE experienced by a respondent, i.e., they should follow adequately judgment in order to state whether particular PTE may fulfill traumatic event criteria, for example from DSM-IV [9].

There are several limitations of our study. Firstly, the reliability analysis was conducted on a relatively small sample, especially during the second measurement, which is crucial for assessing tool's reliability. This kind of analysis is usually conducted on large samples. Secondly, our sample was comprised of students, which questions the representativeness of our sample for Polish population.

Despite these limitations, it is worth mentioning that the Polish adaptation of LEC-5 has satisfactory psychometric properties and may be a convenient tool for PTE screening. This type of measurement, i.e., preliminary PTE screening, is important for at least several reasons. Firstly, all kind of PTE may be psychologically burdensome for a trauma victim. Although the vast majority of people after traumatic events suffer only from temporary psychological problems, there is also a significant amount of trauma victims who develop chronic PTSD. The risk of chronic PTSD depends primarily on the specific type of traumatic event, but there are also studies which indicate that any sort of trauma may also cause PTSD in approx. 9% of participants [2, 3]. In addition, trauma exposure may be also associated with other psychological disorders, such as depression and substance use. High prevalence of PTE in the general population [3, 4] combined with significant amount of people who develop trauma-related disorders

prove that the majority of people are under the great influence of trauma. Regardless of trauma-related psychopathology, exposure to PTE is also associated with great costs for public healthcare and persons who develop chronic PTSD tend to abuse the healthcare system [17]. Screening people after PTE with the use of convenient screening-tool may facilitate more effective and more adequate public healthcare system which is undoubtedly beneficial both for patients and their doctors.

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