Master's Thesis (10 EC):

The Psychometric Properties of the Dutch Posttraumatic Stress Disorder Checklist for

DSM-5 (PCL-5) in a Sample of Relatives of Long-Term Missing People.

Celine Panske

University of Twente

Faculty of Behavioral Management and Social Sciences (BMS), University of Twente

MSc Positive Clinical Psychology and Technology (PCPT)

16 August 2022

1st Supervisor: Dr. Lonneke I. M. Lenferink

2nd Supervisor: Dr. Christina Bode

Abstract

Introduction: The aim of this paper was to assess the psychometric properties of the Dutch PTSD Checklist for DSM-5 (PCL-5) in a sample of relatives of missing people. Due to the ambiguity of the loss, relatives of missing people are at an increased risk of experiencing Posttraumatic Stress Disorder (PTSD) symptoms. So far, the Dutch PCL-5, has not yet been validated in people exposed to a traumatic loss, such as the disappearance of a loved one.

Methods: The analysis was conducted in 134 relatives of long-term missing people. Internal consistency, known-groups validity, convergent validity, and an optimal clinical cut-off score were examined. Specifically, Cronbach's alpha, Mann-Whitney U tests, Spearman's correlation coefficient and Receiver Operating Characteristics (ROC) analysis were conducted.

Results: The PCL-5 showed excellent internal consistency for the total scale ($\alpha = .95$) and good internal consistency for the subscales ($\alpha \geq .86$). Known-groups validity was supported for the variable kinship but not for gender and presumed cause of disappearance. The PCL-5 showed to be strongly, positively associated with measures for Major Depressive Disorder (MDD) and Complicated Grief (CG), supporting the convergent validity. The optimal cut-off score was ≥ 24.

Discussion: Overall this paper demonstrated that the Dutch PCL-5 is a valid and reliable instrument to asses PTSD symptoms in people who are relatives of a missing person. More research is needed on the PCL-5 targeting people who have experienced a traumatic loss, such as a disappearance of a loved one, to allow for more in depth evaluation of reliability and validity of the instrument.

Keywords: Posttraumatic Symptom Disorder Checklist for DSM-5, psychometric properties, Dutch, missing persons

Introduction

In the Netherlands, about 100 individuals remain missing for the duration of more than a year (Van Leiden & Hardeman, 2015). Individuals disappear under various circumstances such as being a victim of a crime, accident, suicidal ideation, armed conflicts, war, kidnapping, disasters or other unexpected circumstances (Baraković et al., 2014; Bundeskriminalamt, 2022). For the family, friends and close people that are left behind, experiencing the long-term disappearance of a loved one can often be seen as a traumatic event and can have severe influences on their psychological health (Baraković et al., 2014; Boss, 1999).

In the DSM-5, a traumatic event is defined as "exposure to an actual or threatened death, serious injury or sexual violence (…)" (American Psychiatric Association, 2013, p. 271), and includes directly experiencing or witnessing the event, or learning the event occurred to other close people (American Psychiatric Association, 2013). Posttraumatic Stress Disorder (PTSD) is a mental disorder that can occur after the experience of a traumatic event. In the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), PTSD is categorized under "Trauma- and Stressor- Related Disorders" (American Psychiatric Association, 2013). PTSD is diagnosed when people experience four types of complaints for longer than a month following a traumatic event: intrusive symptoms, avoidance, negative alterations in cognition and mood, and alterations in arousal and reactivity (American Psychiatric Association, 2013; Van Praag et al., 2020). Prior research has found overlaps between PTSD symptom severity and Major Depressive Disorder (MDD), as well as overlapping with symptoms of Complicated Grief (CG) (Gros et al., 2012; Maercker & Lalor, 2012; Maercker & Znoj, 2010). Approximately 8.7% of people will experience PTSD symptoms at one point in their lifetime (American Psychiatric Association, 2013) and there are groups that seem to be at higher risk of experiencing PTSD symptoms.

Studies have shown that women are approximately twice as likely to experience PTSD symptoms as men. The DSM-5 reports the prevalence for women at 6.1% and the prevalence for men at 3.2% (American Psychiatric Association, 2013; Kimerling et al., 2018). Moreover, relatives of missing people seem to be at increased risk of experiencing PTSD symptoms. Research has pointed to mental health consequences in relatives of missing people. Heeke and Knaevelsrud (2015) for instance concluded in an overview of studies focusing on the psychological impact of experiencing the disappearance of a loved one, that depression, Prolonged Grief Disorder (PGD) and PTSD symptoms are common in relatives of missing people after the disappearance. Additionally, Baraković et al. (2014) investigated PTSD symptoms in women with war missing family members, and concluded that the majority of the women showed severe PTSD symptoms. Most of these women reported experiencing symptoms such as intrusive thoughts about the missing, insomnia, avoidance of other people, and a feeling of numbness. These findings on the psychological impact on relatives of missing people are often explained by the fact that this type of loss is an "ambiguous" or "unconfirmed" loss (Boss, 1999; Lenferink et al., 2019). Boss (1999) for instance stresses that due to the fact that the loss is unresolved, associated events of the disappearance are continuously reexperienced. Hence, the loss misses resolution and can traumatize. Especially, kinship seems to influence the development of PTSD symptoms in relatives of missing people. Research suggests that people who experience the disappearance of their child or spouse show higher PTSD levels than people who lost another family member due to a disappearance (Baraković et al., 2014; Lenferink et al., 2018). Additionally, the presumed cause of disappearance seems likely to have an influence. Research showed that individuals who have lost a loved one due to violent causes such as accidents or disasters, show more severe traumatic distress symptoms such as PTSD in comparison to other, less violent, causes such as natural or anticipated losses (Djelantik et al., 2017; Holland & Neimeyer, 2011;

Kersting et al., 2011). This research focuses on bereaved people but there exist research that suggests that PTSD symptom levels of relatives of missing people are comparable to bereaved people (Heeke et al., 2015; Powell et al., 2010). Hence, it is likely that effects of the presumed cause of disappearance or loss are similarly comparable.

The research illustrates that relatives of missing people seem to be at increased risk of experiencing PTSD symptoms, due to various factors. These health consequences for relatives of missing people and the prevalence of PTSD symptoms in this group, underline the importance of focusing on PTSD levels and treatment options in this target group. It is therefore a necessity, to have reliable instruments to evaluate PTSD symptomatology confidently, to make a provisional diagnosis and be able to offer suitable treatment options.

Different methods of assessment of PTSD symptoms exist. The two most commonly used methods are structured clinical interviews and screening instruments such as questionnaires (Steel et al., 2011). One instrument that is often used in order to assess PTSD (symptoms) is the PTSD Checklist for DSM-5 (PCL-5) (Weathers et al., 2013). The PCL-5 consists of 20 items to be consistent with the 20 DSM-5 symptoms of PTSD and includes the four diagnostic factors: intrusion, avoidance, negative alterations in cognitions and mood, and arousal (Krüger-Gottschalk et al., 2017; Van Praag et al., 2020; Weathers et al., 2013). It is used in both, the clinical context and research (Van Praag et al., 2020). The PCL-5 is predominantly used to screen people for PTSD symptoms, to make an indication for elevated symptomatology or to monitor symptom change after or during treatment (Weathers et al., 2013). The original PCL-5 was developed in English but translated instruments in French, German, Swedish, Chinese, Brazilian, Turkish, Arab, Kurdish and Filipino exist (Van Praag et al., 2020).

The psychometric properties of the original English PCL-5 have been evaluated by different researchers (Ashbaugh et al., 2016; Blevins et al., 2015). Considering the

psychometric properties is important when choosing and instrument. Particularly attention to reliability and validity of the chosen instrument is necessary. According to Steel et al. (2011), validity "refers to the extent to which an instrument measures what it was intended to assess" and reliability "refers to an instrument's ability to consistently measure a construct over time" (Steel et al., 2011, p. 289). The primary domains of reliability and validity that are most commonly tested are internal consistency and test-retest reliability as well es construct, criterion and content validity. These aspects of reliability and validity are important to ensure accuracy of the instrument when using it in research or clinical practice (Steel et al., 2011; Tavakol & Dennick, 2011).

Evaluation of the psychometric properties of the English PCL-5 showed high internal consistency, both for the total scale and the subscales, as well as high concurrent and convergent validity (Blevins et al., 2015; Krüger-Gottschalk et al., 2017). Furthermore, strong test-retest reliability is reported. The support for the four-factor DSM-5 model was however found to be limited (Blevins et al., 2015; Krüger-Gottschalk et al., 2017). Additionally, using a cut-off score of 33, Krüger-Gottschalk et al. (2017) found good diagnostic accuracy of the PCL-5 when tested against the Clinician-Administered PTSD Scale (CAPS) (Weathers et al., 2018). Only one validation paper has been published on the Dutch PCL-5, in a sample of patients with Traumatic Brain Injury (TBI) (Van Praag et al., 2020). The researchers found the Dutch PCL-5 to show excellent internal consistency and reliability as well as high criterion validity and structural validity. Furthermore, a factor analysis showed a good fit for the four-factor DSM-5 model. Because this study focused on validating the Dutch PCL-5 with a sample of TBI patients, more in depth evaluation of the psychometric properties with other groups at risk of PTSD needs to be completed, in order to allow generalizability on the broader population (Van Praag et al., 2020).

As relatives of missing people are at an increased risk of developing PTSD symptoms (Baraković et al., 2014; Heeke & Knaevelsrud, 2015), it seems relevant to evaluate the psychometric properties of the Dutch PCL-5 in this target group. Therefore, the main aim of this current paper will be to evaluate the psychometric properties of the Dutch PCL-5. Because this is the first time, the Dutch PCL-5 is validated in this target group, and only one measurement point was available, this paper will look into internal consistency as a measure for reliability of the instrument, and construct validity in the form of known-groups validity and convergent validity.

As both, the English as well as the Dutch PCL-5 were found to have excellent internal consistency (Blevins et al., 2015; Van Praag et al., 2020), it was expected that the Dutch PCL-5 would show similar results in relatives of missing people ($\alpha > .7$).

Additionally, it was expected that the PCL-5 can distinguish between groups that are known to vary in their PTSD symptom severity. Based on previous research, it was expected that PTSD levels will be higher for women than for men (American Psychiatric Association, 2013; Kimerling et al., 2018) and higher for individuals who have experienced the disappearance of their child or spouse, in comparison to people who have lost other family members, such as a parent or grandparent (Baraković et al., 2014; Lenferink et al., 2018). Additionally, it was expected that PTSD levels will be higher for participants who presume their loved one disappeared due to a violent cause (categorized as criminal act, accident, disaster or war), than for participants who presumed their loved one disappeared due to other causes, such as leaving voluntarily or having no suspicion of a possible cause for the disappearance (Holland & Neimeyer, 2011; Kersting et al., 2011).

Additionally, convergent validity of the PCL-5 and two measures regarding MDD and CG were investigated. As prior research pointed to overlaps between the concepts of PTSD, MDD and CG (Gros et al., 2012; Maercker & Lalor, 2012; Maercker & Znoj, 2010), it was

expected that the PCL-5 strongly correlates with measures of MDD and CG in this sample of relatives of missing people (r > .05).

Lastly, another aim of the current paper was to determine the optimal cut-off score for a provisional diagnosis of PTSD based on the DSM-5 criteria in this sample.

Method

Participants

Survey data was used from a completed PhD-project in 134 Dutch adults who experienced the long-term disappearance of a loved one (Lenferink, 2018). Inclusion criteria for the participants were being an extended family member, spouse or friend of a missing person, the participants had to be fluent in Dutch and had to be at least 18 years old. Lastly, the missing person had to be missing for at least 3 months (Lenferink, 2018).

Recruitment of the participants happened through either invitation letters, sent by a Dutch television show about missing persons, or peer support organizations. Additionally, through referral via a non-governmental organization called "Victim Support the Netherlands" or through recruitment by family and friends and other recruitment-procedures (Lenferink, 2018).

Procedure

The data was collected between July 2014 and January 2016 via a paper-and-pencil questionnaire. The participants completed different questionnaires regarding the correlates and treatment of psychopathology in relatives of a missing person, as well as questions for demographic variables (Lenferink, 2018).

Approval for collection of the data and conducting the study was obtained from a local ethics board. Before conduction of the study, all participants gave written informed consent (Lenferink, 2018).

Measures

The research by Lenferink (2018) included, beside the measure for PTSD, also other measures regarding MDD or CG. Questions concerning demographic variables about the participants and missing persons as well as their relation were also included. The measures that were used in this paper, are described in the following:

The Dutch 20-Item PTSD Checklist for DSM-5 (PCL-5) was used to assess the DSM-5 PTSD criteria (Weathers et al., 2013). The PCL-5 is a self-report measure to screen for PTSD symptoms. The items can be categorized into four clusters based on the DSM-5: intrusive (criterion B), avoidance (criterion C), negative alterations in cognition and mood (criterion D) and arousal (criterion E) (Van Praag et al., 2020; Weathers et al., 2013). Items 1 to 5 assess criterion B, items 6 and 7 measure criterion C, 8 to 14 assess symptoms for criterion D and lastly, items 15 to 20 measure criterion E (Weathers et al., 2013). An example item is:" In the past month, how much were you bothered by having strong negative feelings such as fear, horror, anger, guilt, or shame?" (Weathers et al., 2013). For each item, participants responded on a scale from 0 ("Not at all") to 4 ("extremely") to what extent they experienced PTSD symptoms over the past month. Scores above 1 on at least one B- and C-cluster-item and two D- and E- cluster-items were suggestive for a possible PTSD diagnosis. Score range was between 0 and 80 (Weathers et al., 2013). Hence, higher values on the instrument indicate higher PTSD symptom severity. In this data, the words "stressful experience" in the items was changed into "the events associated with the disappearance" (Lenferink, 2018, p. 80). In a preliminary validation by Van Praag et al. (2020), the Dutch PCL-5 showed excellent internal consistency and high criterion and structural validity.

The 30 item version of *The Inventory of Depressive Symptomatology – Self Rated (IDS-SR)* was used to report MDD levels (Rush et al., 1996). The IDS-SR was designed to assess symptoms of MDD (Rush et al., 1986). In the current data, participants were asked the

frequency of certain depressive symptoms over the past seven days (Lenferink, 2018). Each item is rated on a scale ranging from 0 to 3 (Rush et al., 1986). An example item is: "Feeling Irritable: 0= I do not feel irritable, 1= I feel irritable less than half the time, 2= I feel irritable more than half the time, 3= I feel extremely irritable nearly all of the time." (Rush et al., 1996). Because either appetite increase or decrease, and either weight increase or decrease, but not both of each are included in the scoring, the total score is calculated by summing up 28 out of the 30 items. Total score range is between 0 and 84 (Lenferink, 2018; Rush et al., 1986). Scores >13 are indicative of mild depression (Rush et al., 2003). The IDS-SR shows good psychometric properties in prior research (Rush et al., 1996). In the current sample, considering all answered items, a Cronbach's alpha of .92 was measured.

The 30 item revised version of the *Inventory of Complicated Grief (ICG)* was used to asses CG levels (Prigerson & Jacobs, 2001). It is an extended version of the 19 item ICG developed by Prigerson et al. (1995). The Dutch version that was used in this study, differs from the original version in the sense that two items (items 26 and items 27) are combined into one item. Hence, the Dutch ICG that was used in this paper consists of 29 items (Lenferink, 2018). On a scale form 0 ("never") to 4 ("always"), participants were asked to answer to what extent they experienced the grief symptoms mentioned in the items over the past month (Prigerson et al., 1995). An example item is: "I feel envious of others who have not lost someone close" (Boelen et al., 2003). Wordings in items referring to "death" were changed into wordings referring to "disappearance" (Lenferink, 2018). Scores range from 0 to 116. Higher values indicate higher CG levels. The ICG shows high reliability and validity in prior research (Boelen et al., 2003). In the current sample, a Cronbach's alpha of .95 was measured.

Statistical Analysis

The statistical analysis was conducted in IBM-SPSS Statistics (IBM Corp, 2019). Sample characteristics were calculated for age and gender of the participant, age and gender of the missing person, as well as kinship, time since loss and presumed cause of disappearance. The psychometric properties of the PCL-5 were investigated based on the hypotheses.

Reliability Internal Consistency of the PCL-5 was examined using Cronbach's alpha. Cronbach's alpha was computed for the total scale and each of the subscales based on the four-factor structure in the DSM-5 (American Psychiatric Association, 2013; Field, 2017).

Known-Groups Validity To evaluate known-groups validity, separate Mann-Whitney U tests were conducted, to compare two independent groups (Field, 2017). To test for normality, the Kolmogorov-Smirnov and the Shapiro Wilk test were used. To test for homogeneity of variances beforehand, Levene's test of homogeneity was conducted (Field, 2017).

Convergent Validity To assess convergent validity between the PCL-5 and measures of MDD and CG, correlation coefficients of the sum scores were investigated. To determine, whether to utilize Pearson's or Spearman's correlation coefficient, the data was checked for normality first. On the basis of this analysis, Spearman's correlation coefficient was utilized (Field, 2017).

Determination of a cut-off point To determine an ideal cut-off score for a provisional diagnosis of PTSD in this sample, a Receiver Operating Characteristic (ROC) analysis was used. Therefore, following the DSM-5 diagnostic rule, participants who met the criteria for PTSD were first determined (Weathers et al., 2013). Then, a ROC-curve was obtained by plotting the true-positive rate (sensitivity) against the false-positive rate (1- specificity) (Parija & Kate, 2018). The area under the curve (AUC) was calculated to assess the degree to which

the measure is able to differentiate between participants who met, and participants who did not meet the criteria. An AUC of .5 is suggestive of having no ability to discriminate between participants who meet the criteria and participants who don't. An AUC of .7 to .8 is acceptable, an AUC between .8 and .9 can be seen as excellent and an AUC above .9 can be considered as outstanding (Mandrekar, 2010). Additionally, to calculate an accurate cut-off score for this sample, the Youden's index (sensitivity – (1-specificity)) was calculated. An index below .7 is considered as poor accuracy, an index between .7 and .8 is considered fair, an index between .8 and .9 is considered good. A Youden's index above .9 can be considered as showing excellent accuracy (Ferraris, 2019).

Results

Sample Characteristics

The analysis included 134 individuals. From these participants, 45 were male and 89 were female. The mean age of the participants at the time of the completion of the survey was 58 years (Min.= 19, Max.= 90). The majority of participants reported their child (30.6%) or sibling (23.1%) as missing. Eighty-four (63%) of the missing people were male. The mean age at which a person went missing was 31 years, with a minimum of 0 and a maximum of 72. At the time of the completion of the survey, the person had been missing for an average of 16 years (Min.= 0, Max.= 72). Minimum sum score of the PCL-5 was at 0, maximum sum score at 68, with a mean of 20.96 (SD = 17.35). The sample characteristics are presented in Table 1.

Table 1

Sample characteristics (N=134)

Characteristic	N	%	Mean	SD	Min.	Max.
Gender participants						
Male	45	33.6				
Female	89	66.4				
Age participant (in years)			58.7	14.2	19	90
Gender missing person						
Male	84	62.7				
Female	50	37.3				
Disappeared person is						
Partner/Spouse	18	13.4				
Parent	14	10.4				
Child	41	30.6				
Sibling	31	23.1				
Other family member	28	20.9				
Other	2	1.5				
Time since loss (in years)			16.4	16.9	0	72
Age of missing person at time of disappearance (in years)			31.6	17.2	0	72
Presumed cause of disappearance						
Criminal act	44	32.8				
Voluntarily disappeared	33	24.6				
Accident, disaster, war	33	24.6				
No suspicion	24	17.9				
Sum score PCL-5			20.9	17.35	0	68
PTSD criteria met						

Met	31	23.1
Not met	103	76.9

Reliability

The translated PCL-5 showed an overall excellent internal consistency with Cronbach's alpha at .95. The individual subscales based on the DSM-5 criterions additionally showed good internal consistency. Cronbach's alpha for the total scale and each of the subscales is summarized in Table 2.

Table 2

Internal Consistency of the PCL-5 (N=134)

PCL-5 (sub-) scales	Cronbach's alpha
Total scale	0.95
Intrusive (Criterion B)	0.88
Avoidance (Criterion C)	0.87
Negative alterations in cognition and mood (Criterion D)	0.89
Arousal (Criterion E)	0.86

Known-Groups Validity

Both, the Kolmogorov-Smirnov test (D= .425, p < .001) and the Shapiro-Wilk test (W= .596, p < .001) for normality showed that the data was not normally distributed. Additionally, to test for homogeneity of variances, Levene's Test of Homogeneity showed that for the variables gender ($F(1,132) = 1.89$, p = .17) and presumed cause of disappearance ($F(2,131) = 2.98$, p = .05), variances were equal across groups. For the variable kinship, Levene's test of homogeneity showed that the variances were not equal across groups ($F(6,126) = 2.48$, p = .03). Therefore, separate Mann-Whitney U tests were conducted to test for differences in PTSD levels between the groups. The results are illustrated in Table 3.

Table 3

Mann-Whitney U test results for demographic and loss-related correlates (N=134)

	Mean ranks	Test statistic	P-value
Gender		U = 1776.00	.286
Male	62.47		
Female	70.04		
Kinship		U = 1472.00***	< .001
Child or Spouse	80.05		
Other	57.63		
Presumed cause of disappearance		U = 2189.50	.982
Violent disappearance	67.56		
Other cause	67.41		

Note. *** = significant at the .001 level

For male and female participants, there was no statistically significant difference in PTSD levels found between the groups.

For the variable kinship, there was a statistically significant difference in PTSD levels found. Participants who reported their child or spouse gone missing showed higher item scores in comparison to participants who lost another loved person.

Lastly, the analysis showed no statistically significant difference in PTSD levels between participants who presumed a violent cause of disappearance and participants who presumed other causes of disappearance, such as a voluntary disappearance.

Convergent Validity

Because the data was not normally distributed, Spearman's correlation coefficient was utilized. A strong positive correlation was found between the sum scores of the PCL-5 and MDD. Additionally, the PCL-5 was strongly positively related to a rating of CG. Spearman's correlation coefficient showed a significant correlation. Spearman's correlations are illustrated in Table 4.

Table 4

Spearman's correlations among measures of PTSD, MDD and CG (N=134)

Variable	PCL-5
IDS-SR	.83**
ICG	.80**

Note. ** = p < .01 (one-tail significance)

Determination of the Cut-Off Score

31 of the participants met the DSM-5 criteria of PTSD (American Psychiatric Association, 2013). 103 participants did not meet the criteria. As can be seen from the ROC presented in Figure 1, the curve is close to the left corner, which indicates high sensitivity and high specificity. Additionally, the AUC is high (AUC = .94), which indicates that the model is able to correctly classify outcomes. The optimal cut-off score when using the PCL-5 total score from this sample was ≥ 24. With this score, 100% of the PTSD cases were correctly identified and 21.4% incorrectly identified as a PTSD case. Youden's index was fair (J = 78.6). The possible cut-off scores as well as the Youden's indexes are presented in Table 5.
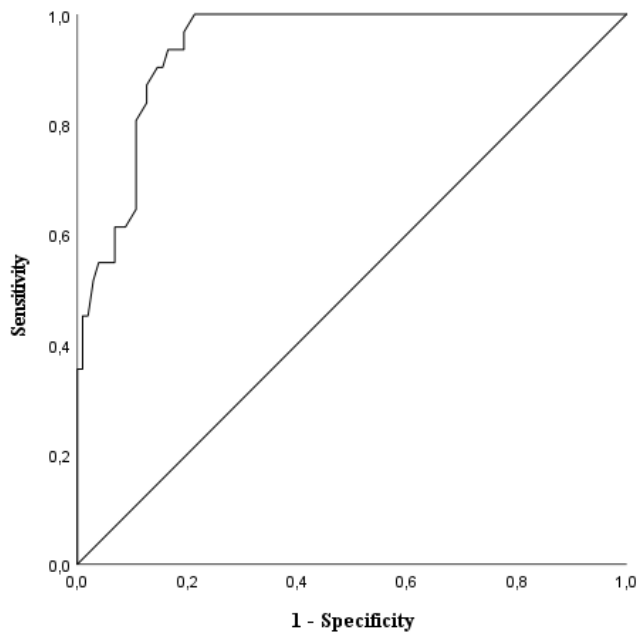
Figure 1. Receiver Operating Characteristic (ROC) curve of the PCL-5.

Table 5

Coordinates of the curve to determine the optimal cut-off score (N=134)

PCL-5 score	Sensitivity	1-Specificity	Youden's Index
≤16.5	1.000	≥.350	≤.650
17.5	1.000	.340	.660
18.5	1.000	.320	.680
20.0	1.000	.301	.699
21.5	1.000	.262	.738
22.5	1.000	.223	.777
23.5	**1.000**	**.214**	**.786**
24.5	.968	.194	.774

25.5	.935	.194	.741
26.5	.935	.165	.770
27.5	.903	.155	.748
28.5	.903	.146	.758
≥30	≤.871	≤.126	≤.745

Discussion

The aim of this present research was to evaluate the psychometric properties of the Dutch PCL-5, a self-report measure to assess PTSD severity. Data was derived from a sample of 134 individuals who experienced the long-term disappearance of a loved one, in a study by Lenferink (2018).

Relatives of missing people, seem to be at increased risk of experiencing PTSD symptoms (Baraković et al., 2014; Heeke & Knaevelsrud, 2015). This underlines the relevance of research with instruments that evaluate PTSD symptoms, such as the PCL-5, in this target group. However, there currently only exists one study that evaluates the psychometric properties of the Dutch PCL-5 and this research only focuses on individuals with TBI (Van Praag et al., 2020). Hence, there seems to be no research on the psychometric properties of the PCL-5 with the current target group of individuals who have experienced the long-term disappearance of a loved one. But due to the increased risk of experiencing PTSD symptoms in this target group, this research seems to be of high relevance.

The reliability of the PCL-5 was assessed first. Overall excellent internal consistency was found for the items of the complete questionnaire and good internal consistency for each of the subscales based on the DSM-5 criteria (American Psychiatric Association, 2013). The high Cronbach's alpha indicates that the items of the PCL-5 reliably measure the same

construct. These findings are similar to results in prior research on the internal consistency of the PCL-5, both the original instrument as well as the translated instrument. A validation study by Blevins et al. (2015) on the original English PCL-5 has found overall excellent internal consistency. Additionally, a preliminary validation of the Dutch PCL-5 (Van Praag et al., 2020), as well as a validation of the German PCL-5 (Krüger-Gottschalk et al., 2017), have found similar results on the internal consistency for the total scale as well as the subscales. As these evaluations of the internal consistency were based on a different target group, the findings of the current paper attest that the items on the Dutch PCL-5 are measuring PTSD symptoms reliably in a sample of people whose loved one has gone missing.

To test the validity of the PCL-5, based on prior research, it was expected that the instrument can differentiate between the groups regarding gender, kinship and presumed cause of disappearance. The known-groups validity in this paper could however only partly be demonstrated. The analysis showed significant differences in PTSD symptoms based on the PCL-5, in participants whose child or spouse disappeared in comparison to participants who reported another close person as missing. These results align with predicted differences that were found in prior research. Lenferink et al. (2018) for instance pointed out that people with a missing child or spouse showed higher PTSD levels than people with a missing parent, sibling or more distant family member. Additionally, Baraković et al. (2014) reported similar results in women with war missing family members. Thus, it can be concluded that the Dutch PCL-5 was able to identify the differences in this group. For the groups gender and presumed cause of disappearance however, there were no significant difference in PTSD levels found. In this analysis, female and male participants did not seem to differ in PTSD levels. These results were not expected as women and men are known to differentiate in PTSD symptom levels, in the sense that women are approximately twice as likely to experience PTSD symptoms as men (American Psychiatric Association, 2013). Additionally, no differences

were found between participants whose loved one presumably disappeared due to a violent cause and those, whose loved one presumably disappeared due to other causes such as a voluntary disappearance. These results do not align with findings by Holland and Neimeyer (2011) and Kersting et al. (2011), who pointed out that experiencing the loss of a loved one due to a violent cause seems to lead to more severe psychological impairment and CG symptoms in comparison to other, non-violent and more anticipated causes. A possible explanation for the lack of differences found between the groups could be the group sizes. Because of the small overall sample size, group sizes for either male or female participants or participants whose loved one disappeared due to a violent cause and participants whose loved one disappeared due to other causes, were likely too small to obtain significant results for these groups that are known to differentiate. Hence, the known-groups validity could only partly be demonstrated in this paper. Further research on the variables kinship and presumed cause of disappearance with larger samples is therefore necessary.

In this paper, the overall sum score of the Dutch PCL-5 showed to correlate strongly with levels of MDD. Based on prior research by Van Praag et al. (2020) and Ashbaugh et al. (2016), who have found similar high correlations between Dutch, English and French PCL-5 scores and levels of depression, this result was expected. These results can be explained by findings of Gros et al. (2012), who suggest that there exist overlaps as well as differences between PTSD and MDD. Additionally, strong positive correlations between PCL-5 scores and levels of CG were shown in this paper. This result was expected as prior research has confirmed the overlap and differences between PTSD and CG (Maercker & Lalor, 2012; Maercker & Znoj, 2010). Maercker and Lalor (2012) have pointed out that the main overlapping domains for PTSD and PGD seem to be intrusive thoughts and yearning but that the differences lie in the emotional meaning of these domains. Due to the strong correlations

found between the PCL-5 and levels of MDD and CG, the findings attest for the convergent

validity of the PCL-5 and indicate that the Dutch PCL-5 measures PTSD symptoms.

Based on the diagnostic scoring rule of the DSM-5 (American Psychiatric Association,

2013), 31 out of the 134 participants have met the criteria for PTSD in this data. The optimal

cut-off score that was found appropriate to predict PTSD in the current sample of individuals

who have experienced the disappearance of a loved one, was set at ≥ 24. This cut-off score is

lower compared to other psychometric work on other samples, meaning that people would be

diagnosed with PTSD earlier. Research by Bovin et al. (2016) and Ashbaugh et al. (2016),

suggested an optimal cut-off score between 31 and 37. Psychometric research on other

samples however, also suggests lower cut-off scores. Ibrahim et al. (2018) for example,

determined a much lower cut-off score of 23 on a sample of war-affected Kurdish and Arab

populations. These differences cannot fully be explained by the form of analysis, as these

other studies have also used ROC-analysis to determine an optimal cut-off score. An

explanation could however be, that studies that have suggested a higher cut-off score between

31 and 37 (Ashbaugh et al., 2016; Bovin et al., 2016), have included other gold standard

diagnostic measurements such as the CAPS (Weathers et al., 2018), which were not utilized in

this paper or the research by Ibrahim et al. (2018), who have also suggested a similar low cut-

off score. Additionally, they did not determine caseness based on the PCL-5. Hence, these

differences have likely influenced the results.

Strengths and Weaknesses

A strength of this study is that this is the first time the PCL-5 was validated in people

exposed to a loss, such as a disappearance. As research suggests that experiencing a loss of a

loved one is potentially a traumatic event that may result in PTSD, this target group is highly

relevant. Additionally, the data not only consisted of responses to the PCL-5, but also to other

instruments measuring similar or distinct constructs. Therefore, it was possible, to assess a

more thorough analysis, utilizing and comparing different constructs.

However, there were also some limitations that need to be considered. First, because of the small sample size, the findings should be interpreted with caution and future research needs to evaluate results with larger samples to be able to confidently draw conclusions for this target group. Especially the known-group differences need to be further evaluated in larger samples. Likely due to small group sizes in this paper, significant results could not be obtained for the variables gender and presumed cause of disappearance. Additionally it is important to mention that out of the 134 participants, 31 met the criteria for a PTSD diagnosis based on the DSM-5 (American Psychiatric Association, 2013). This caseness however, was only predicted by the PCL-5 and no additional assessment of PTSD such as the CAPS, was utilized. This could have influenced the accuracy of the caseness. Hence, the Dutch PCL-5 was not validated against a structured interview for PTSD. As the PCL-5 is only a checklist and should not be used as an diagnostic tool, this is important to mention. It is therefore necessary to be cautious when generalizing these current findings to clinical samples. Lastly, the data was not specifically collected to evaluate the psychometric properties, therefore some of the routine validation and reliability procedures, such as test-retest reliability, were not performed.

Implications and Outlook

The evaluation of the psychometric properties of the Dutch PCL-5 is a critical step to enable possibilities to asses PTSD symptoms in non-English samples. These results and further research across other languages and cultures will enable generalizability of findings. Therefore, further validation across and within different languages would facilitate evaluations on the characteristics of PTSD symptoms across different samples. The free availability of the PCL-5 will enable these investigations. Future research should also include other psychometric tests that were not feasible in this or prior research, such es test-retest reliability to ensure stability over time. In focus should also be further evaluations on known-groups validity as this paper could not determine differences between all the groups

investigated. Further, the psychometric evaluation should include gold standard diagnostic measurements such as the CAPS, to investigate the diagnostic utility more accurately.

Conclusion

The present paper showed that the Dutch PCL-5 is a valid and reliable instrument to assess DSM-5 criteria of PTSD and make a provisional diagnosis in people who experienced a loved one going missing. Specifically, the analysis of the psychometric properties supports the PCL-5's internal consistency as well as convergent validity with instruments measuring symptoms of MDD and CG. Known-groups validity could only be determined for the variable kinship. Known-groups validity for the variables gender and presumed cause of disappearance could not be significantly determined. An optimal cut-off score of ≥ 24, which allows good sensitivity and specificity, was set for the current sample. All in all it can be concluded that the Dutch PCL-5 shows good psychometric properties to be used by clinicians and researchers to evaluate PTSD symptoms across different contexts.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (5th ed.)*. American Psychiatric Publishing.

Ashbaugh, A. R., Houle-Johnson, S., Herbert, C., El-Hage, W., & Brunet, A. (2016). Psychometric Validation of the English and French Versions of the Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5). *PloS One*, *11*(10), e0161645. https://doi.org/10.1371/journal.pone.0161645

Baraković, D., Avdibegović, E., & Sinanović, O. (2014). Posttraumatic stress disorder in women with war missing family members. *Psychiatria Danubina*, *26*(4), 340–346.

Blevins, C. A., Weathers, F. W., Witte, T. K., & Domino, J. L. (2015). The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and Initial Psychometric Evaluation. *Journal of Traumatic Stress*, *28*(6), 489–498. https://doi.org/10.1002/jts.22059

Boelen, P. A., Van den Bout, J., Keijser, J. de, & Hoijtink, H. (2003). Reliability and validity of the Dutch version of the inventory of traumatic grief (ITG). *Death Studies*, *27*(3), 227–247. https://doi.org/10.1080/07481180302889

Boss, P. (1999). *Ambiguous loss: Learning to live with unresolved grief*. Harvard University Press.

Bovin, M. J., Marx, B. P., Weathers, F. W., Gallagher, M. W., Rodriguez, P., Schnurr, P. P., & Keane, T. M. (2016). Psychometric properties of the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (PCL-5) in veterans. *Psychological Assessment*, *28*(11), 1379–1391. https://doi.org/10.1037/pas0000254

Bundeskriminalamt. (2022). *Die polizeiliche Bearbeitung von Vermisstenfällen in Deutschland*. https://www.bka.de/DE/UnsereAufgaben/Ermittlungsunterstuetzung/BearbeitungVer

misstenfaelle/bearbeitungVermisstenfaelle.html;jsessionid=48127E4A569CA5C89D9

C3A803ACC7BFA.live602?nn=30666#doc19618bodyText3

Djelantik, A. A. A. M. J., Smid, G. E., Kleber, R. J., & Boelen, P. A. (2017). Symptoms of

prolonged grief, post-traumatic stress, and depression after loss in a Dutch community

sample: A latent class analysis. *Psychiatry Research*, *247*, 276–281.

https://doi.org/10.1016/j.psychres.2016.11.023

Ferraris, V. A. (2019). Commentary: Should we rely on receiver operating characteristic

curves? From submarines to medical tests, the answer is a definite maybe! *The

Journal of Thoracic and Cardiovascular Surgery*, *157*(6), 2354–2355.

https://doi.org/10.1016/j.jtcvs.2018.10.100

Field, A. (2017). *Discovering Statistics Using IBM SPSS Statistics* (5th edition). *SAGE edge*.

SAGE Publications.

Gros, D. F., Price, M., Magruder, K. M., & Frueh, B. C. (2012). Symptom overlap in

posttraumatic stress disorder and major depression. *Psychiatry Research*, *196*(2-3),

267–270. https://doi.org/10.1016/j.psychres.2011.10.022

Heeke, C., & Knaevelsrud, C. (2015). Uneindeutiger Verlust. Psychopathologische und

psychosoziale Konsequenzen im Kontext gewaltsamer Konflikte [Ambiguous loss.

Psychopathological and psychosocial consequences in the context of violent conflicts].

Der Nervenarzt, *86*(7), 826–832. https://doi.org/10.1007/s00115-014-4234-0

Heeke, C., Stammel, N., & Knaevelsrud, C. (2015). When hope and grief intersect: Rates and

risks of prolonged grief disorder among bereaved individuals and relatives of

disappeared persons in Colombia. *Journal of Affective Disorders*, *173*, 59–64.

https://doi.org/10.1016/j.jad.2014.10.038

Holland, J. M., & Neimeyer, R. A. (2011). Separation and Traumatic Distress in Prolonged

Grief: The Role of Cause of Death and Relationship to the Deceased. *Journal of*

Psychopathology and Behavioral Assessment, *33*(2), 254–263.

https://doi.org/10.1007/s10862-010-9214-5

IBM Corp. (2019). *IBM SPSS Statistics for Macintosh* (Version 26.0) [Computer software].

IBM Corp. Armonk, NY.

Ibrahim, H., Ertl, V., Catani, C., Ismail, A. A., & Neuner, F. (2018). The validity of

Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5) as screening instrument

with Kurdish and Arab displaced populations living in the Kurdistan region of Iraq.

BMC Psychiatry, *18*(1), 259. https://doi.org/10.1186/s12888-018-1839-z

Kersting, A., Brähler, E., Glaesmer, H., & Wagner, B. (2011). Prevalence of complicated

grief in a representative population-based sample. *Journal of Affective Disorders*,

131(1-3), 339–343. https://doi.org/10.1016/j.jad.2010.11.032

Kimerling, R., Allen, M. C., & Duncan, L. E. (2018). Chromosomes to Social Contexts: Sex

and Gender Differences in PTSD. *Current Psychiatry Reports*, *20*(12), 114.

https://doi.org/10.1007/s11920-018-0981-0

Krüger-Gottschalk, A., Knaevelsrud, C., Rau, H., Dyer, A., Schäfer, I., Schellong, J., &

Ehring, T. (2017). The German version of the Posttraumatic Stress Disorder Checklist

for DSM-5 (PCL-5): Psychometric properties and diagnostic utility. *BMC Psychiatry*,

17(1), 379. https://doi.org/10.1186/s12888-017-1541-6

Lenferink, L. I. M. (2018). *The disappearance of a significant other: Consequences and care*.

Rijksuniversiteit Groningen; Ridderprint BV.

Lenferink, L. I. M., Keijser, J. de, Wessel, I., & Boelen, P. A. (2018). Cognitive-Behavioral

Correlates of Psychological Symptoms Among Relatives of Missing Persons.

International Journal of Cognitive Therapy, *11*(3), 311–324.

https://doi.org/10.1007/s41811-018-0024-y

Lenferink, L. I. M., Keijser, J. de, Wessel, I., Vries, D. de, & Boelen, P. A. (2019). Toward a

    Better Understanding of Psychological Symptoms in People Confronted With the

    Disappearance of a Loved One: A Systematic Review. *Trauma, Violence & Abuse*,

    20(3), 287–302. https://doi.org/10.1177/1524838017699602

Maercker, A., & Lalor, J. (2012). Diagnostic and clinical considerations in prolonged grief

    disorder. *Dialogues in Clinical Neuroscience*, *14*(2), 167–176.

    https://doi.org/10.31887/DCNS.2012.14.2/amaercker

Maercker, A., & Znoj, H. (2010). The younger sibling of PTSD: Similarities and differences

    between complicated grief and posttraumatic stress disorder. *European Journal of

    Psychotraumatology*, *1.* https://doi.org/10.3402/ejpt.v1i0.5558

Mandrekar, J. N. (2010). Receiver operating characteristic curve in diagnostic test assessment.

    *Journal of Thoracic Oncology : Official Publication of the International Association

    for the Study of Lung Cancer*, *5*(9), 1315–1316.

    https://doi.org/10.1097/JTO.0b013e3181ec173d

Parija, S. C., & Kate, V. (Eds.). (2018). *Thesis Writing for Master's and Ph.D. Program* (1st

    edition 2018). Springer Singapore.

    https://ebookcentral.proquest.com/lib/kxp/detail.action?docID=5588739

Powell, S., Butollo, W., & Hagl, M. (2010). Missing or Killed: The differential effect on

    mental health in women in Bosnia and Herzegovina of the confirmed or unconfirmed

    loss of their husbands. *European Psychologist*, *15*(3), 185–192.

    https://doi.org/10.1027/1016-9040/a000018

Prigerson, H. G., & Jacobs, S. C. (2001). Traumatic grief as a distinct disorder: A rationale,

    consensus criteria, and a preliminary empirical test. In M. S. Stroebe (Ed.), *Handbook

    of bereavement research: Consequences, coping & care* (pp. 613–645). American

    Psychological Association. https://doi.org/10.1037/10436-026

Prigerson, H. G., Maciejewski, P. K., Reynolds, C. F., Bierhals, A. J., Newsom, J. T., Fasiczka, A., Frank, E., Doman, J., & Miller, M. (1995). Inventory of complicated grief: A scale to measure maladaptive symptoms of loss. *Psychiatry Research*, *59*(1-2), 65–79. https://doi.org/10.1016/0165-1781(95)02757-2

Rush, A. J., Giles, D. E., Schlesser, M. A., Fulton, C. L., Weissenburger, J., & Burns, C. (1986). The inventory for depressive symptomatology (IDS): Preliminary findings. *Psychiatry Research*, *18*(1), 65–87. https://doi.org/10.1016/0165-1781(86)90060-0

Rush, A. J., Gullion, C. M., Basco, M. R., Jarrett, R. B., & Trivedi, M. H. (1996). The Inventory of Depressive Symptomatology (IDS): Psychometric properties. *Psychological Medicine*, *26*(3), 477–486. https://doi.org/10.1017/s0033291700035558

Rush, A. J., Trivedi, M. H., Ibrahim, H. M., Carmody, T. J., Arnow, B., Klein, D. N., Markowitz, J. C., Ninan, P. T., Kornstein, S., Manber, R., Thase, M. E., Kocsis, J. H., & Keller, M. B. (2003). The 16-Item quick inventory of depressive symptomatology (QIDS), clinician rating (QIDS-C), and self-report (QIDS-SR): a psychometric evaluation in patients with chronic major depression. *Biological Psychiatry*, *54*(5), 573–583. https://doi.org/10.1016/S0006-3223(02)01866-8

Steel, J. L., Dunlavy, A. C., Stillman, J., & Pape, H. C. (2011). Measuring depression and PTSD after trauma: Common scales and checklists. *Injury*, *42*(3), 288–300. https://doi.org/10.1016/j.injury.2010.11.045

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, *2*, 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd

Van Leiden, I., & Hardeman, M. (2015). *Vermisten op de kaart: Aard en omvang van langdurige vermissingen. Politiekunde: nr. 72A*. Politie & Wetenschap; Bureau Beke; Reed Business, realisatie.

Van Praag, D. L. G., Fardzadeh, H. E., Covic, A., Maas, A. I. R., & Steinbüchel, N. von
(2020). Preliminary validation of the Dutch version of the Posttraumatic stress
disorder checklist for DSM-5 (PCL-5) after traumatic brain injury in a civilian
population. *PloS One*, *15*(4), e0231857. https://doi.org/10.1371/journal.pone.0231857

Weathers, F. W., Bovin, M. J., Lee, D. J., Sloan, D. M., Schnurr, P. P., Kaloupek, D. G.,
Keane, T. M., & Marx, B. P. (2018). The Clinician-Administered PTSD Scale for
DSM-5 (CAPS-5): Development and initial psychometric evaluation in military
veterans. *Psychological Assessment*, *30*(3), 383–395.
https://doi.org/10.1037/pas0000486

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P.
(2013). *The PTSD Checklist for DSM-5 (PCL-5)*. Scale available from the National
Centre for PTSD at http://www.ptsd.va.gov/