




Screening for psychotrauma related symptoms: Japanese translation and pilot testing of the Global Psychotrauma Screen

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ABSTRACT

Background: The impact of traumatic experiences or adverse life experiences has been shown to potentially affect a wide range of mental health outcomes. However, there was no brief instrument to screen for a range of psychological problems in different domains after a potentially traumatic event, and for risk factors and protective factors.

Objective: The aim of this study is to examine the internal consistency and concurrent validity of the Japanese version of the Global Psychotrauma Screen (GPS) in a traumatized sample in Japan.

Method: A total sample ($n = 58$) with varying levels of potential posttrauma symptoms due to domestic violence or other events were recruited into this study. Self-rating measures of posttraumatic stress disorder (PTSD), depression, anxiety, and alcohol problems were conducted to investigate the concurrent validity.

Results: The results show that a range of posttrauma symptoms assessed by the GPS were highly endorsed by this traumatized sample in all domains except for self-harm, derealization, and depersonalization. The GPS sum score was highly correlated ($r > 0.79$) with other measures of PTSD, depression, and anxiety symptoms. Also, the subdomain scores showed acceptable correlations with corresponding domain measures. Participants who had been sexually assaulted or had unwanted sexual experiences, and participants who had been physically assaulted during childhood, had higher scores on the total GPS and on subdomains of PTSD, as well as symptoms associated with Complex PTSD.

Conclusions: This study provides an initial indication that the GPS may be a useful screening tool for trauma survivors and elucidates that the consequences of trauma are not limited to PTSD.

Tamizaje de síntomas asociados con trauma psicológico: traducción japonesa y prueba piloto del mapeo global de psicotrauma

Antecedentes: Se ha demostrado que el impacto de las experiencias traumáticas o de las experiencias vitales adversas tiene el potencial de comprometer la salud mental dentro de un amplio rango de consecuencias. Sin embargo, no existía ningún instrumento breve para tamizar una variedad de problemas psicológicos, en diferentes dominios, después de un evento potencialmente traumático, ni para los factores de riesgo, ni para los factores protectores.

Objetivo: El objetivo de este estudio es el de examinar la consistencia interna y la validez concurrente de la versión japonesa del Mapeo Global de Psicotrauma (GPS, por sus siglas en inglés) en una muestra de personas traumatizadas en Japón.

Método: Para este estudio, se reclutó una muestra total ($n=58$) con distintos niveles de síntomas postraumáticos potenciales secundarios a violencia doméstica u otros eventos. Para investigar la validez concurrente, se realizaron mediciones auto reportadas para el trastorno de estrés postraumático (TEPT), la depresión, la ansiedad y para problemas asociados al consumo de alcohol.

Resultados: Los resultados muestran que un espectro de síntomas postraumáticos, evaluados mediante el GPS, se encontraba altamente vinculado a esta muestra de personas traumatizadas en todos los dominios, a excepción de las autolesiones, la desrealización, y la despersonalización. El puntaje final del GPS se encontraba altamente correlacionado ($r > 0,79$) con otras mediciones del TEPT, la depresión y los síntomas ansiosos. Además, los puntajes de los subdominios del GPS mostraron una correlación aceptable con las medidas de dominios correspondientes. Los participantes que habían sido agredidos sexualmente o habían tenido experiencias sexuales no deseadas, y los participantes que habían sido agredidos físicamente durante su infancia mostraban puntajes más altos en el GPS total y en los subdominios del TEPT, así como para los síntomas asociados al TEPT complejo.

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关键词

筛查; 家庭暴力; 焦虑; 抑郁; 解离; 饮酒问题; 复杂性PTSD; PTSD; 全面心理创伤筛查

HIGHLIGHTS

- Japanese version of the Global Psychotrauma Screen (GPS) showed good internal consistency and concurrent validity.
- GPS could detect wide range of trauma-related symptoms.
- Higher GPS scores were found for childhood physical trauma and sexual trauma.

Conclusiones: Este estudio proporciona un primer indicio de que el GPS podría ser una herramienta de tamizaje útil para sobrevivientes al trauma, y esclarece que las consecuencias del trauma no se limitan al TEPT.

对心理创伤相关症状的筛查：全面心理创伤筛查的日语版翻译和初步测试

背景: 创伤经历或不良生活经历的冲击已显示出可能影响一系列广泛的心理健康结果。但是，目前尚无任何简短工具可以筛查潜在创伤事件后不同领域的一系列心理问题，风险因素和保护因素。

目的: 本研究旨在考查日本创伤样本中全面心理创伤筛查 (GPS) 日文版的内部一致性和同时效度。

方法: 本研究收集了因家庭暴力或其他事件而具有不同程度的潜在创伤后症状的样本 ($n = 58$)。进行创伤后应激障碍 (PTSD)，抑郁，焦虑和酒精问题的自我评估，以考查其同时效度。

结果: 结果表明，GPS 评估的一系列创伤后症状在除自我伤害，现实解体和人格解体之外的所有领域都在这一创伤样本中得到高度验证。GPS 总得分与 PTSD，抑郁和焦虑症状的其他测量高度相关 ($r > 0.79$)。同样，子域分数显示出与相应域测量的可接受的相关性。被性侵犯或有非自愿性经历的参与者，以及在童年时期遭受过性侵犯的参与者，在总 GPS 和 PTSD 子域以及复杂性 PTSD 相关症状上得分更高。

结论: 本研究初步表明，GPS 可能是对创伤幸存者有用的筛查工具，并阐明创伤的后果不仅限于 PTSD。

1. Introduction

The impact of traumatic experiences or adverse life experiences has been shown to potentially affect a wide range of mental health outcomes, the most typical being those in the area of trauma- and stressor-related disorders, but also depressive (Bonde et al., 2016; LeMoult et al., 2019; Mandelli, Petrelli, & Serretti, 2015; North, Baron, & Chen, 2018; Riedl et al., 2019) and anxiety disorders (Choudhary, Smith, & Bossarte, 2012; Riedl et al., 2019), sleep problems (Fan, Zhou, & Liu, 2017), and addiction (Murphy, Kruse, Elklit, & Brink, 2019; Oe et al., 2016) are common. Furthermore, self-injurious behaviour (Lusk, Sadeh, Wolf, & Miller, 2017) and dissociation (Vonderlin et al., 2018) have been reported after trauma at a high frequency.

The wide range of potential consequences and the lack of one instrument screening for these have led to the development of the Global Psychotrauma Screen (GPS). The GPS is meant to be a brief instrument to screen for a range of psychological problems after a potentially traumatic event, as well as for the most important risk factors and protective factors (Olff & Bakker, 2016). Its items are compiled from existing brief screening tools (see below).

The GPS was developed in the context of a project by the 'Global Collaboration on Traumatic Stress', whose steering committee consists of representatives from all major traumatic stress societies (Olff et al., 2020; Schnyder et al., 2017). There was the need for a simple, cross-culturally valid, and easy to administer screener appropriate for use in a variety of trauma-exposed samples (Olff et al., 2020).

The aim of this study is to examine the internal consistency and the concurrent validity of the Japanese version of the Global Psychotrauma Screen, and whether GPS can detect a wide range of

trauma-related symptoms. For this purpose, we used instruments that assessed symptoms of PTSD, depression, anxiety, and alcohol problems. In order to include participants with a range of potential symptoms, we recruited study participants with varying levels of potential posttrauma symptoms, namely help-seeking domestic violence survivors, help-receiving domestic violence survivors, and outpatients with a trauma history. In addition, we expected that scores on measures of specific mental health domains would be related to subdomain item scores in the GPS. Finally, we expected that participants who had a history of sexual assault or unwanted sexual experiences, and patients who had a childhood history of physical assault would show higher GPS total scores. This hypothesis was formulated because severe stressors of a prolonged nature or multiple or repeated adverse events from which separation is not possible to have been associated with a wider range of symptoms including those associated with Complex PTSD (CPTSD) as in the International Classification of Diseases-11 (ICD-11, Maercker et al., 2013).

2. Methods

2.1. Study participants

The total sample ($n = 58$) participated in the study from three traumatized populations in Japan. The first subsample were 26 help-seeking domestic violence survivors who visited the gender-equality promotion centre in Kurume city in order to seek social support; of a total of more than 100 who were asked for participation, 54 received a questionnaire to complete (response rate: 48%). The second subsample were 19 of 20 consenting domestic violence survivors who were receiving support from Non-Governmental

Organizations (NGOs) in two cities (anonymized city A and B) in Japan using snowball sampling methods (response rate: 95%). Finally, the third subsample of 13 adult outpatients were included with mixed trauma history who visited the Department of Neuropsychiatry, Kurume University Hospital, although because we did not collect information on the number of participants who were invited to participate from this hospital, calculation of a response rate for this group was not possible.

2.2. Study design and procedure

This study was a cross-sectional study. The questionnaires were provided by the health-care providers. The participants answered the questionnaires and returned the answer sheets anonymously by postal mail. The participants received no monetary compensation. This study was approved by the ethics commission of the Kurume University (No. 17269).

2.3. Traumatic experiences

Traumatic experiences were assessed using the Japanese Traumatic Experiences Checklist (TEC-J), which has been developed in the 1990s by the Tokyo Institute of Psychiatry (Research group on pathophysiology and treatment guidelines for traumatic-stress related disorders funded by the Ministry of Health, Labour and Welfare, 2001). TEC-J is a self-report scale assessing previous exposure to 16 potentially traumatic events. The English translation of TEC-J is shown in Supplementary file 1. TEC-J is widely used in Japan because it has been included in the Japanese version of the Clinician Administered PTSD Scale (DSM-IV) (unpublished). TEC-J is similar to the Life Events Checklist (LEC, Gray, Litz, Hsu, & Lombardo, 2004). Respondents answered the number of times they had experienced each event directly as either 'none', 'once', or 'twice or more' and, additionally, whether they had witnessed experiences of the event and/or were strongly shocked to learn that a family member or a close acquaintance had experienced the same event. Of note, whereas participants were asked whether they had experienced sexual assault or unwanted sexual experiences or 'Physical assault as a child' they were not asked about childhood sexual abuse due to this being a taboo subject particularly at the time when the TEC-J was first developed in the 1990s and due to cross-cultural considerations. We used TEC-J to compare the scores of GPS and other psychological measures between people with specific traumatic experiences and people without those experiences. Cronbach's alpha for TEC-J was 0.68 in this study.

2.4. Measures

The *Global Psychotrauma Screen (GPS)* developed by the 'Global Collaboration on Traumatic Stress' (Olf et al., 2020; Schnyder et al., 2017), a brief and freely

available measure, can be administered after different types of potential traumatic events. It consists of 22 items, 17 symptom items and 5 risk or protective factors, each to be answered in a yes/no format (Olf & Bakker, 2016). Its items were wherever possible compiled from existing measures such as the Primary Care PTSD Screen for DSM-5 (PC-PTSD-5, Prins et al., 2016) for PTSD symptoms and the Patient Health Questionnaire-4 (PHQ-4, Kroenke, Spitzer, Williams, & Löwe, 2009) for anxiety and depression symptoms. For a description of the development of the GPS see Olf et al. (2020) and www.global-psychotrauma.net/gps. The 17 symptom items assess: PTSD symptoms; affective dysregulation and negative self-concept; depression symptoms; anxiety symptoms; dissociation; sleep problems; self-injurious behaviour; substance abuse; and other problems (physical, emotional, or social). The five risk or protective items assess other stressful events; social support; traumatic life events in childhood; history of psychiatric treatment; and resilience. The GPS total score is calculated using all 22 items, ranged 0–22. A total symptom score is the sum score of the 17 symptom items (range 0–17). A risk factor score is the sum score of the five risk or protective items (range 0–5).

For validation purposes, we have been constructing GPS subdomains of items based on what they were meant to assess: PTSD was calculated using five items (range 0–5); Disturbances in Self-Organization (DSO) items: Affective dysregulation and Negative self-concept (range 0–2); Depression (2 items); Anxiety (2 items); Dissociation (2 items). The Japanese translation of the GPS was developed following Sousa and Rojjanasrirat's guideline for use in cross-cultural health-care research (Sousa & Rojjanasrirat, 2011) including translation and back-translation by bilingual translators, pilot testing ($n = 6$) for feasibility and understanding of items, and the final version was determined after the discussion among the authors.

It is important to note that the short version of the GPS (1.2) was used for this study which did not include questions about index trauma (as in the 2.0 version (<https://gps.global-psychotrauma.net>)), information of traumatic experiences was obtained only from the TEC-J.

The *PTSD Checklist for DSM-5 (PCL-5)* is a 20-item self-report measure that assesses the 20 DSM-5 symptoms of PTSD (Blevins, Weathers, Davis, Witte, & Domino, 2015). A total symptom severity score (range 0–80) can be obtained by summing the scores for each of the 20 items. A cut-off point of 33 or higher is regarded as a possible PTSD case. The Japanese Version of PCL-5 was developed by Ito et al. (Ito, Takebayashi, Suzuki, & Horikoshi, 2019) and Cronbach's alpha coefficient of the total score was 0.97 in their study.

The *Patient Health Questionnaire-9 (PHQ-9)* is a 9-item self-report measure that assesses the nine

DSM-IV depression symptoms (Kroenke, Spitzer, & Williams, 2001). A total symptom severity score can range from 0 to 27. The Japanese version of PHQ-9 was developed by Muramatsu et al. (Muramatsu et al., 2007) and Cronbach's alpha coefficient of the total score was 0.92 in their study.

The *Generalized Anxiety Disorder-7 (GAD-7)* is a 7-item self-report measure that assesses generalized anxiety over the past 2 weeks (Spitzer, Kroenke, Williams, & Löwe, 2006). A total symptom severity score can range from 0 to 21. The Japanese version of GAD-7 was developed by Muramatsu et al. (Muramatsu et al., 2009) and Cronbach's alpha coefficient of the total score was 0.92 in their study.

The *CAGE* (an acronym for Cutting down, Annoyance, Guilt and Eye-opener) is a 4-item self-report measure that assesses the problem drinking (Ewing, 1984). The total CAGE score (0–4) was used as an index of problem drinking. The Japanese version of CAGE was developed by Hiro et al. (Hiro, Shima, Yoshino, & Katoh, 1994) and Cronbach's alpha coefficient of the total score was 0.83 in their study. In this study, more than three-fourth (77.8%) of the participants scored 0.

2.5. Statistical analysis

All statistical analyses were conducted using JMP Pro for Windows, Version 14 (SAS Institute Inc.).

The Shapiro-Wilk test was used to check normal distributions of the variables. Because PHQ-9 and CAGE did not show the normal distribution, we decided to use the non-parametric analyses. The Spearman's correlation coefficients were used for the correlation analyses between psychological symptom scales. The Mann-Whitney U-test was used for comparison between two groups (that is, by sex, and by the presence vs. absence of specific traumatic experiences).

Concurrent validity between GPS (total scores or subdomains of GPS) and existing tests was evaluated by the Spearman's correlation coefficients.

3. Results

3.1. Demographics

Of the 58 participants, the majority were female ($n = 54, 93\%$). The sociodemographic characteristics of the study participants are shown in Table 1.

3.2. GPS and subdomain instruments

Scores on the psychological measures and subdomains are shown in Table 2. The mean GPS total score was 10.92 (SD 5.96) with participants endorsing a wide range of symptoms and risk and protective factors. Item content and per cent endorsement are shown in Figure 1. Low endorsement (lower than

Table 1. Sociodemographic characteristics of the study participants.

	Total ($n = 58$)
Gender	
Female ($n, (\%)$)	54 (93.10)
Male ($n, (\%)$)	4 (6.90)
Age, years old (mean (SD))	47.63 (13.30)
Marital status	
Single ($n, (\%)$)	8 (13.79)
Married ($n, (\%)$)	17 (29.31)
Separate ($n, (\%)$)	12 (20.69)
Bereavement ($n, (\%)$)	5 (8.62)
Divorced ($n, (\%)$)	16 (27.59)
Number of children (mean (SD))	1.48 (1.17)
Traumatic experiences (multiple answers allowed)	
Natural disaster ($n, (\%)$)	21 (36.21)
Transportation accident ($n, (\%)$)	21 (36.21)
Physical assault ($n, (\%)$)	18 (31.03)
Sexual assault ($n, (\%)$)	13 (22.41)
Other unwanted or uncomfortable sexual experience ($n, (\%)$)	18 (31.03)
Childhood physical assault ($n, (\%)$)	9 (15.52)
Other terrible, shocking events that most people don't experience ($n, (\%)$)	14 (24.14)

20%) was observed in some items, namely self-harm, derealization and depersonalization.

3.3. Reliability of GPS

Cronbach's alpha of the GPS total in this study was 0.90 indicating excellent internal consistency. Cronbach's alpha for the subdomains of the GPS are shown in Table 2. Item-total correlations of GPS total were between 0.38 and 0.74, except for the item on traumatic life events in childhood (0.15).

3.4. Concurrent validity of GPS

With regard to the concurrent validity for GPS total, we conducted the Spearman's rank correlation analyses (Table 3). GPS total score and GPS symptom score showed high correlations (all $r > 0.79$) with PCL-5, PHQ-9, and GAD-7. A low correlation with CAGE was found. Because more than three-quarters of the participants scored zero with CAGE, this may be considered as a floor effect. Therefore, we conducted the Wilcoxon test to compare the CAGE score between the participants who answered yes or no to GPS item no.18 which asked whether, 'In the past month, have you tried to reduce tensions by using alcohol, tobacco, drugs or medication?'; there was a significant difference between the two groups in the expected direction ($|Z| = 3.84, p < 0.01$), wherein the mean score of CAGE was higher in the 'yes' group (1.00 ± 1.00) than in the 'no' group (0.15 ± 0.49).

Results of concurrent validity analyses between subdomains of GPS and related psychological symptom scales are shown in Table 3. Correlations with PTSD, DSO, Depression, and Anxiety subdomains were greater than 0.66 which seems to indicate satisfactory concurrent validities. In comparison, correlations with Substance

Table 2. Scores of psychological symptom scales among groups.

Scales	Score range of the participants	Total (n = 58)	95% CI	By gender		Cronbach's alpha
				Male (n = 4)	Female (n = 54)	
GPS Total (mean (SD))	0–22	10.92 (5.96)	9.23–12.61	6.67 (3.79)	11.19 (5.99)	0.90
GPS Symptoms (mean (SD))	0–17	7.98 (5.07)	6.57–9.39	4.75 (2.99)	8.25 (5.14)	0.90
GPS Risk factor (mean (SD))	0–5	2.65 (1.51)	2.25–3.06	1.67 (0.58)	2.71 (1.53)	0.58
PCL-5 (mean (SD))	0–73	32.96 (20.45)	27.38–38.54	21.25 (11.81)	33.90 (20.77)	
PHQ-9 (mean (SD))	0–26	11.91 (7.52)	9.83–13.98	10.25 (9.00)	12.04 (7.49)	
GAD-7 (mean (SD))	0–21	9.76 (6.56)	7.97–11.55	7.00 (8.37)	9.98 (6.45)	
CAGE (mean (SD))	0–3	0.40 (0.78)	0.20–0.61	0.75 (0.96)	0.38 (0.77)	
GPS subdomains						
GPS PTSD subdomain (mean (SD))	0–5	2.60 (1.96)	2.06–3.15	1.00 (1.15)	2.73 (1.97)	0.84
GPS DSO subdomain (mean (SD))	0–2	1.04 (0.85)	1.26–0.81	1.00 (0.82)	1.38 (0.86)	0.66
GPS Depression subdomain (mean (SD))	0–2	1.21 (0.82)	0.99–1.44	0.75 (0.96)	1.25 (0.81)	0.64
GPS Anxiety subdomain (mean (SD))	0–2	1.25 (0.80)	1.04–1.47	0.75 (0.50)	1.29 (0.81)	0.57
GPS Dissociation subdomain (mean (SD))	0–2	0.27 (0.59)	0.11–0.43	0 (0)	0.29 (0.61)	0.64

PCL-5: The PTSD Checklist for DSM-5, PHQ-9: The Patient Health Questionnaire-9 (PHQ-9), GAD-7: The Generalized Anxiety Disorder-7 (GAD-7), GPS: The Global Psychotrauma Screen, DSO: Disturbances in Self-Organization, SD: Standard Deviation.

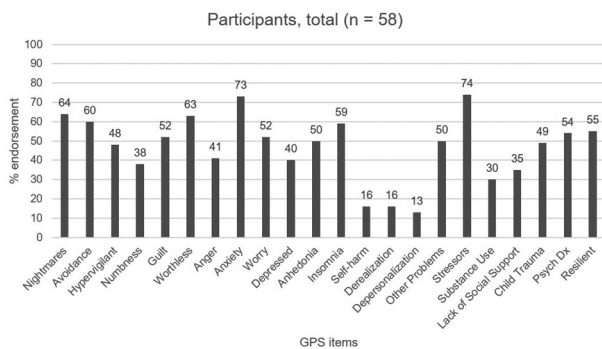


Figure 1. Per cent endorsement of GPS items (total sample).

Table 3. Spearman’s rank correlation analyses between GPS and psychological symptom scales.

	PCL-5	PHQ-9	GAD-7	CAGE
GPS Total	0.87**	0.81**	0.83**	0.23
GPS Symptoms	0.84**	0.79**	0.80**	0.18
GPS Risk factor	0.65**	0.63**	0.62**	0.22
<i>Correlations with corresponding domain</i>				
GPS PTSD subdomain	0.66**			
GPS DSO subdomain	0.68**			
GPS Depression subdomain		0.76**		
GPS Anxiety subdomain			0.72**	
GPS Substance abuse question				0.52**
GPS Dissociation subdomain	0.47**			

PCL-5: The PTSD Checklist for DSM-5, PHQ-9: The Patient Health Questionnaire-9 (PHQ-9), GAD-7: The Generalized Anxiety Disorder-7 (GAD-7), GPS: The Global Psychotrauma Screen, DSO: Disturbances in Self-Organization

***p* < 0.01

abuse and Dissociation were 0.52 and 0.47, which seems to indicate moderate concurrent validities.

3.5. Risk or protective items of GPS

We conducted the Spearman’s rank correlation analysis between GPS risk factor score and GPS symptoms score and found a moderate correlation between the two scores (*r* = 0.47, *p* < 0.001). GPS risk factor

score also showed moderate correlations with PCL-5, PHQ-9, and GAD-7 (see Table 3).

3.6. Comparison by types of trauma history

We compared participants whose most stressful trauma type was:

- (1) disaster or accidents (events no. 1–5 of TEC-J, *n* = 9) versus interpersonal trauma (events no. 6–12 of TEC-J, *n* = 26);
- (2) sexual traumatic experiences (*n* = 23) vs. without sexual traumatic experiences (*n* = 35) (i.e. sexual assaults group and unwanted or uncomfortable sexual experiences); and
- (3) childhood physical assaults (*n* = 9) vs. without childhood physical assaults (*n* = 49).

We investigated the group of sexual assault and ‘other unwanted or uncomfortable sexual experience’ group together because Japanese people tend to avoid direct description such as ‘sexual assault’ for their experiences of sexual victimization.

Figures 2–4 show the per cent endorsement per item by the aforementioned three groups. Persons who endorsed exposure to interpersonal trauma endorsed many items more frequently than did those who only endorsed being exposed to disasters or accidents, especially nightmares, avoidance, anger, and child trauma history (Figure 2). Persons who had sexual traumatic experiences also showed higher endorsement in items not only avoidance and hypervigilance but also on negative alternation in cognition and mood, such as numbness, guilt or anger (Figure 3). Finally, persons who had experienced childhood physical trauma showed higher endorsement in all items (Figure 4). In fact, nightmares, avoidance, worthless, depressed, and childhood trauma were observed in all participants with childhood physical trauma (Figure 4).

Means and standard deviations of psychological symptom scales by types of trauma history across

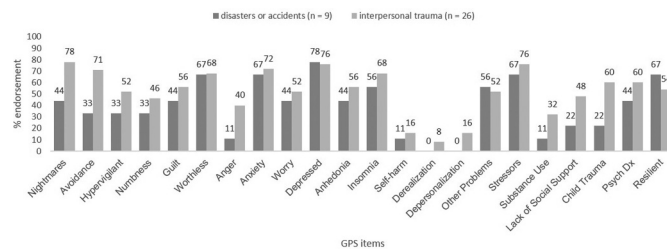


Figure 2. Per cent endorsement of GPS items (disasters or accidents vs interpersonal trauma).

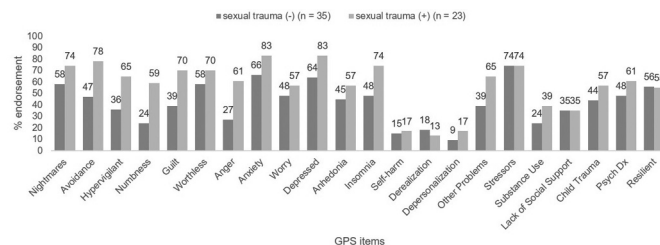


Figure 3. Per cent endorsement of GPS items (without sexual trauma vs with sexual trauma).

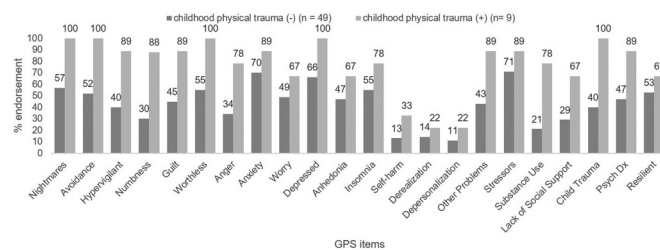


Figure 4. Per cent endorsement of GPS items (without childhood physical trauma vs with childhood physical trauma).

the three groups are shown in Table 4. The total GPS score, as well as the total symptom score, was highest in subjects with childhood physical trauma, followed by the group with sexual trauma, and finally, those classified by interpersonal trauma (see Table 4).

- (1) Comparing persons whose most stressful trauma types were disasters or accidents versus interpersonal in nature, there were no significant differences.
- (2) For sexual traumatic experiences, significantly higher scores of GPS total, GPS symptoms, as well as PTSD and DSO subdomains of GPS were observed in participants with sexual traumatic experiences.
- (3) For childhood physical assault, significantly higher scores of GPS total, GPS symptoms, GPS risk factor as well as PTSD and DSO subdomains of GPS were observed in participants with a history of childhood physical assault.

4. Discussion

This pilot study examined the reliability and validity of the Japanese version of the Global Psychotrauma

Screen (GPS) in a traumatized sample in Japan. The GPS screens for a wide range of potential psychological problems after a traumatic event, as well as for risk factors and protective factors. As far as we know, this is the first validation study of GPS among a Japanese traumatized population. This study included participants who experienced trauma with potentially varying levels of risk of posttrauma symptoms. While the measure intends to assess a wide variety of potential symptoms, its internal consistency was excellent. Low item-total correlation for the item on traumatic life events in childhood, however, was observed which may be because this item asked about the history of the participants, while the other items asked about the current symptoms.

The GPS total score and GPS symptom score correlated highly with the validation measures for PTSD symptoms, depression symptoms as well as anxiety symptoms. Moreover, the GPS subdomain scores correlated with corresponding domain scales, showing that GPS has a good concurrent validity. However, we found a low correlation of GPS with the scale of problem drinking. In this context, it is important to note that more than 75% of the participants had scored 0 of CAGE. Although we did not ask directly

Table 4. Comparison between participants by types of trauma history.

	Most stressful trauma type: disasters or accidents (n = 9)		Most stressful trauma type: interpersonal trauma (n = 26)		Without sexual traumatic experiences (n = 35)		With sexual traumatic experiences (n = 23)		Without childhood physical assaults (n = 49)		With childhood physical assaults (n = 9)	
	mean (SD)	Z	mean (SD)	Z	mean (SD)	p	mean (SD)	p	mean (SD)	p	mean (SD)	p
GPS Total (mean (SD))	8.56 (4.93)	1.48	11.78 (5.94)	1.48	9.52 (5.97)	0.14	12.86 (5.49)	0.04	9.74 (5.64)	0.04	17.13 (3.14)	< 0.01
GPS Symptoms (mean (SD))	6.33 (4.00)	1.29	8.43 (4.88)	1.29	6.70 (4.95)	0.20	9.73 (4.81)	0.03	7.07 (4.84)	0.03	13.00 (3.12)	< 0.01
GPS Risk factor (mean (SD))	2.22 (1.72)	1.22	3.00 (1.56)	1.22	2.55 (1.46)	0.22	2.82 (1.59)	0.47	2.37 (1.44)	0.47	4.11 (0.93)	< 0.01
GPS subdomains												
GPS PTSD subdomain (mean (SD))	1.89 (1.69)	1.41	2.91 (1.93)	1.41	2.00 (1.81)	0.16	3.45 (1.90)	< 0.01	2.22 (1.89)	< 0.01	4.75 (0.71)	< 0.01
GPS DSO subdomain (mean (SD))	0.78 (0.67)	0.93	1.08 (0.86)	0.93	0.85 (0.80)	0.35	1.30 (0.88)	0.047	0.89 (0.84)	0.047	1.78 (0.44)	< 0.01
GPS Depression subdomain (mean (SD))	1.22 (0.83)	0.32	1.32 (0.80)	0.32	1.09 (0.88)	0.75	1.39 (0.72)	0.22	1.13 (0.85)	0.22	1.67 (0.50)	0.09
GPS Anxiety subdomain (mean (SD))	1.11 (0.78)	0.46	1.24 (0.83)	0.46	1.16 (0.81)	0.64	1.39 (0.78)	0.27	1.20 (0.81)	0.27	1.56 (0.73)	0.21
GPS Dissociation subdomain (mean (SD))	0 (0)	1.40	0.24 (0.52)	1.40	0.25 (0.57)	0.15	0.30 (0.63)	0.78	0.24 (0.57)	0.78	0.44 (0.73)	0.3

GPS: The Global Psychotrauma Screen, DSO: Disturbances in Self-Organization, SD: Standard Deviation.

whether our participants drink alcohol in everyday life, it is not difficult to imagine that there is underreporting or that the proportion of drinkers may be low and there was a floor effect.

In this study, we showed that GPS could detect a wide range of trauma-related symptoms and confirm that a variety of symptoms may arise after trauma. Low endorsement of derealization and depersonalization may support a finding on the less prevalent dissociative subtype of PTSD in DSM-5 (Hansen, Ross, & Armour, 2017).

The total scores on the GPS, the PTSD subdomain scores as well as specifically GPS items referencing CPTSD-specific symptoms such as the DSO items, differed depending on trauma type. In particular, these symptoms were higher especially for childhood physical trauma but also following sexual trauma vs non-sexual trauma, which is in line with previous studies (e.g. Hansen & Olf, 2017). According to a review of ICD-11 PTSD and CPTSD (Brewin et al., 2017), childhood interpersonal trauma has been reported at significantly higher rates among those fulfilling the CPTSD as compared to the PTSD symptom profile. Although we did not distinguish participants' sexual traumatic experience histories from childhood repetitive sexual victimization, there might be repetitive sexual abuse survivors in childhood in our study. A recent population-based study (Cloitre et al., 2019) showed that sexual and physical abuse by caregivers were identified as events associated with risk for CPTSD, whereas sexual assault by non-caregivers and abduction were risk factors for PTSD.

In this study, the reported prevalence of traumatic experiences was not high, although most of the study participants were categorized into trauma-survivors. In addition, one-fourth of the participants answered that their traumatic events were 'other events'. According to the World Mental Health Survey (WMHS), 60.7% of respondents experienced at least one lifetime trauma in Japan, in comparison to 70% for all respondents across 24 countries (Benjet et al., 2016). Interestingly, 15% of Japanese respondents in the WMHS reported 'private events' or 'some other event' for their traumatic experiences, which may indicate a hesitancy to referring to the details of their trauma experiences; the prevalence of this kind of response was higher than those in other countries (Kawakami et al., 2014). The authors also found that the 'private' or 'other' events were associated with a higher conditional risk of PTSD (Kawakami et al., 2014). The tendency of concealing traumatic experiences was also observed after the Fukushima Nuclear Power Plant Accident; residents in the evacuated area concealed the fact that they lived in Fukushima, because the public had negative assumptions regarding the effects of radiation on future pregnancy or

genetic inheritance (Maeda & Oe, 2017). These findings may indicate that severe and more personal events may have been culturally underreported, because of stigma and embarrassment (Dussich, Fujiwara, & Sagisaka, 2001; Kawakami et al., 2014). It is also observed in a clinical setting in Japan that traumatized patients often tend to avoid verbalizing their experiences and related symptoms (Schnyder et al., 2016).

The possibility of underreporting might be also considered for the severity of the GPS score. The results of ongoing researches of the GPS showed that the mean score of GPS total in this study (10.92) is lower than those of a clinical sample in Germany (15.73), but higher than those of a refugee sample in an Australian study (8.36). (Olf et al., 2020). Response bias may also influence the results, because a cross-national study reported that Japanese and Korean participants were more likely to choose a mid-point response in Likert scales than American participants (Tasaki & Shin, 2017). In a global study using the GPS worldwide examining Cross-Cultural responses to COVID-19 versus other traumatic events (GPS-CCC, <https://www.global-psychotrauma.net/covid-19-projects>) preliminary findings also show that Japanese respondents reported lower symptom levels (Olf, personal communication). This tendency may be associated with collectivist cultures (Chen, Lee, & Stevenson, 1995). For future cross-cultural studies, it would be valuable to include measurements on culture orientations (Olf et al., 2019). Future accumulation of data may reveal areas of commonality (Ho et al., 2020; Kameoka et al., 2020; Oe, Ito, Takebayashi, Katayanagi, & Horikoshi, 2020) and differences with Western results.

This study has several limitations. To begin with, our study included a clinically relevant population of severely traumatized individuals. In detail, there was a small number of participants, and an unequal gender distribution in the sample. Low number of male participants prevents us from gender-sensitive analyses. It is of note though that all GPS and subdomain scores were higher in female participants than male participants in line with previous literature on gender differences (Olf, 2017; Ramikie & Ressler, 2018). Further, there was no healthy-comparison group which included people with no trauma history or people with trauma history but without any help-seeking behaviours. The participants' traumatic experiences tend to be biased towards domestic violence and this can be considered a sampling bias. For future research, a large-scale representative population study in Japan, including both genders, will be needed. Other limitations derive from study methods. This study was a cross-sectional study; therefore, we cannot discuss whether GPS scores may change with time, for instance improve with treatment. We used only self-report measures and did not use diagnostic interviews. We did not administer an

additional self-report measure for complex PTSD symptoms. Finally, TEC-J does not distinguish between childhood sexual experiences and adulthood sexual experiences, although TEC-J asks about the occurrence of childhood physical assaults directly. In addition, childhood neglect experiences were unable to be captured by TEC-J. If an individual 'only' has childhood neglect in his/her history, and cannot refer to a single event or experience that affects him/her the most, such traumatized individuals may not be captured by the GPS. Because the revised version of GPS has a set of questions on index trauma with an open-ended question, future studies may be able to assess childhood trauma in greater detail. A study in combination with a questionnaire asking about childhood maltreatment might also be worthwhile.

Despite these limitations, this research provides an initial indication that the GPS may be a useful and valid screening tool for trauma survivors in Japan. The GPS, especially the web-based app available online (<https://gps.global-psycho-trauma.net>), might also be a valuable tool in the current COVID-19 pandemic where domestic violence is likely to increase due to the social isolation measures (Asahi Shimbun, 2020; El Hage, 2020). Further studies such as a large-scale representative population study covering symptoms related to a range of potentially traumatic experiences are especially needed.

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Data availability statement

The data that support the findings of this study are available from the corresponding author, Misari Oe, upon reasonable request.




Disclosure statement

No potential conflict of interest was reported by the authors.

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