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The Interrater Reliability of the Survivors of Torture Psychosocial Wellbeing Index: An Assessment Matrix Instrument

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ABSTRACT

The United States continues to resettle refugees fleeing conflict, persecution, and torture, enabling many of the world's most vulnerable individuals to start over and become productive citizens. The rehabilitation of survivors of torture is a complex process that requires service providers to assess a number of factors connected to the multidimensional construct of human wellbeing. The recently developed assessment instrument matrix, Survivors of Torture – Psychosocial Wellbeing Index (SOT-PWI), offers professional providers a way to capture quality of life metrics within the torture treatment settings. The current study sought to establish the reliability of SOT-PWI with a diverse sample of U.S.-based torture treatment professionals. Using intraclass correlation coefficient (ICC), results suggest that the SOT-PWI achieves a solid interrater reliability, although education level and years of work experience can influence assessment consistency. Error analysis revealed very good accuracy. Study limitations, implication for practice, and future research are considered as well.

KEYWORDS

Assessment; intraclass correlation; interrater reliability; psychosocial functioning; torture; wellbeing

Introduction

The United States has been an ongoing top recipient of refugees from around the world, having resettled approximately 85,000 refugees in 2016 (U.S. Department of State, 2017). Current research estimates that around 44% of refugees in the U.S. have experienced torture (Higson-Smith, 2015). Applying this percentage to the more than 3 million refugees who have resettled since 1975, the number of survivors of torture (SOT) could be as high as 1.3 million, or even higher, since this estimate does not account for SOT granted a legal asylum protection (Members of the National Consortium of Torture Treatment Programs (NCTTP), 2015). Front line social work with SOT populations in the U.S. and around the world is both demanding and challenging, as increasing numbers of social workers are faced with providing services to newly arrived communities (Chang-Muy & Congress, 2016), whose needs are often submerged in a highly charged political discourse that circumscribes the facilitation of needed services (Robinson & Masocha,

2017). Outside the U.S., most of social work services to refugee and asylum-seeking populations are delivered in non-government organizations (NGOs) (Robinson, 2013). Within the U.S., support to refugees and SOT is provided through the Office of Refugee Resettlement (ORR), a subdivision of the U.S. Department for Health and Human Services located under the Administration of Children and Families (ACF). ORR operates many life-saving refugee assistance programs in its function to maximize refugees' health, wellbeing, and potential by linking them to critical resources that assist them in becoming integrated members of American society. The Services for Survivors of Torture program is one such example (see, <https://www.acf.hhs.gov/orr/programs/survivors-of-torture>).

The SOT have often lost family, home, country, and livelihoods, and they frequently have been traumatized emotionally and physically (Barneche & Matos, 2014). Research has well identified that their experience with torture is a strong contributor to their health and mental

health, and adaptation to life in a new country (Kira, Ashby, Odenat, & Lewandowsky, 2013; Quiroga & Jaranson, 2005). As refugees, SOT have to overcome adversities posed by physical and psychological sequelae of trauma, compounded by psychosocial and environmental difficulties associated with resettlement, acculturation, and striving for self-sufficiency (Kira et al., 2006) (for more information on torture, see: <http://www.ncttp.org/abouttorture.html>).

Recognizing the complexity of the SOT rehabilitation, effective torture treatment requires a coordinated system of care that integrates multi-disciplinary knowledge of human behavior with assuring access to comprehensive set of holistic services (Asgary & Segar, 2011) provided through compassionate service delivery (Crosby, 2013; Kira, 2002). Unfortunately, assessment tools that address the multisystemic needs of SOT are few, and, if they exist (Barneche & Matos, 2014), they tend to focus primarily on mental health (Montgomery & Patel, 2011), do not assess environmental factors (Isakson & Jurkovic, 2013; Winter, 2011), or lack holistic integration (Jaranson & Quiroga, 2011). To mitigate this gap in research, practice, and policy, the Survivors of Torture-Psychosocial Wellbeing Index (SOT-PWI) was developed in 2014, to serve as a new assessment instrument that could be applied by direct care providers in torture treatment settings, specifically to address the multiple psychosocial needs of SOT. The SOT-PWI was successfully piloted at one torture treatment program in the northeastern U.S. (Hodges-Wu & Zajicek-Farber, 2017). The pilot study presented this tool's conceptual validity and demonstrated the benefits in applying the SOT-PWI assessments over time, thus capturing and documenting changes in the wellbeing of SOT. However, since only one case manager used the SOT-PWI for client assessments in the original study, the consistency in the scale's application by different providers could not be addressed. Therefore, the purpose of the current study was to investigate the interrater (interobserver) reliability of the SOT-PWI when used by multiple providers. Gaining interrater reliability is an important component for determining whether providers with different levels of

experience are likely to reach similar levels of consistency in their assessment (Hallgren, 2012).

Background and Literature Review

The increasing awareness of the deleterious effects that torture, systematic persecution, and organized violence have on human wellbeing has given rise to screening and assessment methods that predominantly focus on individual mental health (Masocha & Simpson, 2012), despite the recognized importance and impact of other environmental factors on psychosocial human needs and wellbeing (Lerner, Bonanno, Keatley, Joscelyne, & Keller, 2016; McFarlane & Kaplan, 2012; Robertson, Savik, Mathiason-Moore, Mohamed, & Hoffman, 2016; Weiss et al., 2016). To buttress the importance of assessing and treating a wide range of psychosocial needs, research has shown that provision of post-migration supportive and ecologically holistic environmental resources and services can lessen the negative traumatic responses following torture, and help with resettlement, social integration, and wellbeing of SOT (Kira et al., 2012; Raghavan, Rasmussen, Rosenfeld, & Keller, 2013; Schweitzer, Melville, Steel, & Lacherez, 2006; Winter, 2011). Such research is also supported by the social determinants of mental health (SDMH) framework (Galea & Steenland, 2011), which recognizes that although individuals' physical and mental health are intricately and critically related, human wellbeing is also critically affected by social determinants of material circumstances (e.g., housing and neighborhood environment), psychosocial stressors (e.g., negative life vents, and coping styles), behavioral and biological factors (e.g., exercise, diet, drinking, smoking, or choices of social play behaviors), and by the availability and access to societal community resources (e.g., eligibility for governmental cash assistance, social benefits, or medical assistance) through which, individuals' structural determinants (i.e., income, education, occupation, social class, gender, race/ethnicity, and nativity status) operate and exert influence on human psychosocial functioning (Commission on Social Determinants of Health, 2008).

In practice and in research, the concept of human wellbeing is viewed as a complex and multidimensional construct (Brown & Westaway, 2011), and its conceptualization encompasses a dynamic system of interrelated human needs and psychosocial functioning that are reflected in quality of life (McGregor, Camfield, & Woodcock, 2009), are person-specific (Nussbaum, 2003), and comprise human resources, agency, and pursuit of the living standard within local environments (Gough, 2004). The concept of wellbeing includes dimensions of attributes of people's life circumstances (e.g., related to material possessions, body, social-emotional and psychological functioning, productivity and accomplishment, and autonomy) that are typically found within environmental contexts of physical resources, employment, income, education, health, and housing (King, Renó, & Novo, 2014), and thus is theoretically, socio-culturally, and ecologically embedded (Maggino & Zumbo, 2012).

Therefore, for SOT to rebuild their lives in the U.S., and to reintegrate, become self-sufficient, and to achieve a good quality of life in their new post-immigration cultural environment, the assessment of their wellbeing has to consider the fulfillment of their basic psychosocial needs and capabilities, and whether they have access to opportunities and resources to fulfill those needs and capabilities. Thus, Hodges-Wu and Zajicek-Farber (2017) suggested that a holistic, ecological view of the person in environment (PIE) needed to be taken into account when the SOT-PWI matrix tool was developed for the assessment of 24 human life domain needs of SOT. The PIE view recognizes the importance of the interrelated nature between the vulnerable capabilities that SOT encounter in meeting their basic needs, while also having to meet the challenges posed by legal immigration, economic stressors, grieving, family disruption, and political and power dynamics in accessing resources (Basoglu, Jaranson, Mollica, & Kastrup, 2001; Kira, 2002), in addition to the coping and management of their health and mental health-related needs.

The selected domains of wellbeing in the SOT-PWI matrix are based on the theoretical conceptualizations of life domains and capabilities

perceived to be essential to both the satisfaction and self-realization of adult individuals in meeting their basic and other relevant human needs, and in achieving a self-determined quality of human functioning within their environmental living contexts (Doyal & Gough, 1991; Maslow, 1967; Sen, 1993). The matrix format for assessment of different levels of life domains in the SOT-PWI tool was derived from the conceptual work of Max-Neef (1991) on organizing and evaluating basic needs for the achievement of quality in wellbeing (Pelenc, 2014). The assessment scoring of all the domains in the SOT-PWI matrix is organized along a 4-point scaled continuum of wellbeing that reflects an individual's state of wellbeing on a selected domain area of functioning, and ranges from a state of crisis, to a state of vulnerability, to stability, and finally, to a state of reasonable safety.

The SOT-PWI is not the first matrix tool or instrument to address or evaluate various domains of psychosocial needs in human service delivery. The SOT-PWI is an adaptation of the Snohomish County self-sufficiency matrix intended for the use with low-income individuals and families served by community services (Snohomish County Self-Sufficiency Task Force, 2004). In turn, the Snohomish matrix was based on the earlier standards for addressing economic self-sufficiency created in the mid-1990s addressing poverty (Pearce, 2017). Research has also shown that matrix scales are often designed to assess multiple domains, with the potential for further exploration of domains that show to be most important. In human service delivery, matrix scales have been used as both outcome measures (Barneche & Matos, 2014) as well as case management practice tools in a variety of service provision fields including economic self-sufficiency (Richmond, Pampel, Zarcu, Howey, & McChesney, 2017), public mental health care (Fassaert et al., 2014), and homeless services (Culhane, Parker, Poppe, & Sykes, 2008; Gelberg, Andersen, & Leake, 2000). The matrix scale concept aligns with a strengths based framework (Saleebey, 2013) for delivering social services as it identifies assets, challenges, and areas of need. Deriving a matrix assessment score for individual domains and for the total instrument prior to the

initiation of service delivery sets a baseline, and then, through periodic reassessment, helps guide service goals and objectives, resource referrals, and the overall social service delivery for targeted human service outcomes (Richmond et al., 2017).

For example, Gelberg, Andersen, and Leake (2000) used a matrix system for assessing and meeting the essential needs of adults with multiple vulnerabilities. Based on a behavioral model for conceptualizing a matrix of a psychosocially driven wellbeing, Gelberg et al. tested their matrix assessment with a community-based sample of 363 homeless individuals. After 8 months of service provision with frequent reassessments using the matrix scale, Gelberg et al. found that the case identification and referral process for health or mental health care could be successfully accomplished for clients with frequent life crises and multi-related vulnerabilities, and could co-occur with other needed social service efforts to help such clients find permanent housing, address correlated issues of mental illness and substance abuse, and teach them how to use and access various environmental resources in their community. The results of the study by Gelberg et al. lend credence to the underlying belief in the current study that a consistent reliable application of a matrix scale can successfully facilitate the use of more comprehensive services, and thus assure the improvement in human functioning for the population of SOT, who often present with multiple and interrelated needs.

Barneche and Matos (2014) used a 14-domain matrix tool (another adaptation of Snohomish County self-sufficiency matrix) specifically with 54 adult foreign-born SOT, who received an initial assessment, followed by remote (phone delivered) case-management services, and then 6-month reassessment, again with the tool. Subsequently, they conducted a retrospective case analysis, and found that of the 14 domains assessed by the matrix tool, 12 domains showed a statistically significant improvement between the two time points of assessments. Barneche and Matos thought that using a matrix assessment to document the impact of case management over time was particularly helpful in tracking, monitoring, and evaluating individual client outcomes on the selected domains, and particularly with

SOT who present as a difficult-to-serve population. However, they also acknowledged they were using an adapted matrix tool with untested validity.

More recently, Richmond et al. (2017) reported that although matrix scales are increasingly used for measuring self-sufficiency related outcomes in human services, there has been little testing of their reliability or validity. To address this gap, Richmond et al. conducted a reliability study on a commonly used matrix tool for the assessment of family support needs. Their study design utilized written case-vignettes that were assessed by family advocate professionals using a matrix tool. The analytical approach calculated an intraclass correlation for determining interrater reliability or levels of agreement and consistency among the assessment ratings of the family advocates. The findings of the Richmond et al. study revealed that the matrix tool produced consistent and objective ratings of self-sufficiency for case-vignette related clients across their need-related life domains, again reinforcing the value of documenting the empirical evidence of a matrix tool's utility, including reliability and accuracy.

Focus of the Current Study

Considering that the SOT-PWI tool was developed to be applied by direct care professional providers who may differ in their education (Murray et al., 2011) and professional experiences (Barrington & Shakespeare-Finch, 2014; McCullough-Zander & Larson, 2004) with SOT populations, the investigation of the interrater reliability and accuracy of the SOT-PWI is the logical next step. To address these needs, the current study was guided by three specific research questions:

1. When applying SOT-PWI, were direct service care providers able to consistently assess or rate the SOT-clients depicted in distinct case-vignettes across the specified multiple domains of wellbeing?
2. Did providers' level of education and work-experience with the SOT populations influence the reliability of their assessments?

3. Controlling for age, gender, and general work experience, did providers' levels of education and work experience with the SOT populations predict the number of errors that providers made in assessments?

Methodology

Study Design

The current study applied a cross-sectional survey design with a sample of professional providers delivering services to SOT populations across the U.S. To recruit the study participants, the first two authors of the study first publicized the study through the NCTTP program membership and then presented the aims of the study, and recruited participants during a business meeting of the 2016 spring-annual NCTTP research conference. The study procedures required that when a potential participant expressed interest in the study (at the NCTTP conference, or later by e-mail, or phone call), they were provided with a study packet that included all instructions, *Informed Consent* for ethical study participation, and all study assessment materials. The data collection process took place from March through the end of August, 2016. During this time-frame, 70 study packets were given out, and 50 were received with all consented and completed materials, resulting in a 71% response rate. Subsequently, three participants were removed from analytical considerations as their demographic profile (with a doctoral level of education) did not reflect the profile of a more typical direct care service provider to SOT populations.

Study Sample

The demographic characteristics of the sampled participants ($N=47$) are as follows (see Table 1). Most (91.5%) participants were between 23 and 40 years of age. The majority were female. The race/ethnicity profile showed that close to two-thirds (62%) were Caucasian (non-Hispanic). Their education was fairly evenly split between undergraduate and graduate education. On average, they had around 4 years of general work experience in human services prior to their work with SOT (Mean = 4.5 years, $SD = 3.76$). On

Table 1. Participants characteristics ($N = 47$).

Age	23–30 years	17 (36%)
	31–35 years	15 (32%)
	36–40 years	11 (24%)
	41–64 years	4 (8%)
Gender	Male	8 (13%)
	Female	39 (83%)
Race/ethnicity	Caucasian (non-Hispanic)	29 (62%)
	African American	7 (15%)
	Middle Eastern/Arabic	5 (11%)
	Hispanic/Latino	4 (8%)
	Asian	2 (4%)
Education	BA undergraduate degree	21 (45%)
	MA graduate degree	26 (55%)
General work experience	0–2 years	12 (25%)
	3–5 years	22 (47%)
	6–17 years	13 (28%)
	Professional work experience with SOT	19 (40%)
Professional work experience with SOT	3–5 years	10 (21%)
	6–17 years	18 (39%)

average, they also had around 4 years of professional work experience with SOT populations (Mean = 3.9 years, $SD = 4.5$).

Data Collection

The study packets included the invitation and description of the study with a step-by-step protocol for facilitating anonymous responses, two duplicate copies of *Informed Consent* documents (one to sign and return, and one to keep), information on how to claim a modest reward (\$40.00 gift card) for the time spent in completing study assessment activities, the actual study guide with the study instrument for completing the study, and two separately stamped return envelopes. One envelope was for returning the respondents' completed study with anonymous assessment ratings, and the second for claiming the reward along with a signed *Informed Consent*. The two envelopes were needed to assure respondents' anonymity. Prior to the actual study implementation, the use of the study packet and its contents were pretested using 20 direct care providers and administrators from various local agencies providing services to refugees and SOT. These pre-testers were not subsequently involved in the study. The authors' university institutional review board (IRB) approved the study's procedures.

Within the study packet, after participants read their instructions and consented to participate, they were then asked to proceed to the collated

study guide that included all the necessary assessment-related materials including the study instrumentation. In the study guide, first, participants were asked to examine, review, and read the SOT-PWI matrix tool in order to familiarize themselves with the short definitions of the 24 domain attributes and the rating system. Second, participants were asked to read and practice assessment rating with the SOT-PWI instrument for a selected number of domains on one case-vignette that depicted an adult individual SOT. For this practice, participants were provided assessment ratings (scores) for this case with a brief description of the rationale behind the ratings and the decision making. Finally, participants were asked to read (in sequence as presented), assess, and rate (score) the four distinct study case-vignettes using the SOT-PWI. This step was followed by the completion of a demographic questionnaire that asked about the participants' general demographic characteristics, education, and work experiences. Although the assessment ratings of the four study case-vignettes could be completed in less than 1 hour, depending on the participants' reading abilities and time taken for assessment deliberations with each case-vignette, the entire process of completing the study could take up to 2 hours, as shown during the pre-testing phase of the study materials before the deployment of the study.

Study Instrumentation

The study instrumentation included four specifically developed case-vignettes and the assessment instrument, the SOT-PWI matrix rating tool for assessing the psychosocial needs of the SOT-clients described in the vignettes.

Case-Vignettes

The vignettes described different SOT-clients, or individual adults in the context of their environmental life situations and difficulties, for which the SOT-clients were seeking support and services from a torture treatment program in the U.S. The contents of the vignettes were based on actual client case composites. Each vignette was further developed via feedback from various local

SOT service providers 1 year prior to the current study.

The four distinct case-vignettes were constructed to depict different levels of complexity in describing the life situations and the needs of the SOT individuals. Based on research, individuals who have experienced torture can vary greatly in their abilities, comfort level, and willingness to share the information concerning their needs, issues, or problems during screenings or assessments (Evans, 2016). We based the description of the contents for the vignettes on the accepted official conceptualizations of torture and persecution experiences of asylum seekers who have suffered persecutions and gross human right violations as reflected in the legal U.S. definition of torture (used by ORR for determining service eligibility: see, <https://www.acf.hhs.gov/orr/programs/survivors-of-torture>) while we also considered the United Nations' articles that define torture and such trauma-related acts (United Nations, 1984). Within the vignettes, we depicted SOT-clients based on their wider social, economic, and environmental difficulties known to have an impact on their psychosocial wellbeing. We specifically avoided describing the SOT as a distinct, homogenous client group defined mainly by their chronic health needs, or specific psychological mental health diagnoses, as is common in many current studies (Patel, Williams, & Kellezi, 2016). However, the behavior or experiences of the SOT described in the vignettes did include brief discussions of SOT mood, feelings, and behaviors that were meant to reflect their mental health state, but this information was presented in the overall context of their other wider psychosocial needs for which these SOT-clients were seeking support and services. The case-vignettes depicted the following summarized scenarios:

- Case 1: A 28-year-old gay male from Uganda expressing suicidal ideation and difficulties related to economic insecurity and social isolation;
- Case 2: A 31-year-old male recently resettled from Iraqi and individually struggling, and perpetrating domestic violence;
- Case 3: A 22-year-old female, an Evangelical Christian from Eritrea, presenting with a history

of anxiety and depressive symptoms, and currently struggling to cope with bad news from her home country;

- Case 4: A 48-year-old Sudanese male struggling with substance abuse amidst family reunification.

More specifically, case-vignettes “1” and “3” were written to focus on the individual psychosocial needs of the SOT-clients. Case-vignettes “2” and “4” were written to be more complex as they focused on the rehabilitation of the SOT-client impacted by complicated family dynamics. The description of each case-vignette was between 1 and 1.5 pages long, single spaced and with breaks among short paragraphs. Each vignette was followed by a table that allowed the study participant to anonymously rate (score) the selected life domains for each depicted client using the provided SOT-PWI matrix tool.

Assessment Instrument

The SOT-PWI matrix tool covers 24 life domains necessary for quality wellbeing in psychosocial functioning of adult SOT, which are presented in the following order: legal-immigration needs, food, housing-dwelling inside, household functioning and relationships in the U.S., material needs, language and communication, transportation, community environmental safety, access to health care, physical health needs, mental health needs, functional abilities, substance use, legal-other non-immigration needs, employment, education and vocational training, income, support system abroad, support system in the U.S., spirituality, community involvement, parenting skills for their own children in the U.S., and childcare for their own children in the U.S.

Typically, the SOT-PWI is applied by assessing (scoring) the psychosocial wellbeing on each life domain along a 4-point Likert scale continuum (i.e., a state of 1 = crisis, 2 = vulnerable, 3 = stable, and 4 = safe) repeatedly over 3-month periods, from intake through client exit from services. The SOT-PWI also provides conceptual brief descriptions of common behaviors used as indicators manifested at each of the behavioral-rated levels, and the score of “0” may be used

when the information is either unobtainable at the time of assessment (although it is expected that under typical provision of services, the provider would make a reasonable effort to obtain such information within a short period of time or during follow-up). In the current study, the score of “0” could be used when information was “unavailable” or not described in the case-vignette according to the perception of the study participant.

In this study, the participants rated only six domains for the client described by each case-vignette. That is, for the first case-vignette, the study participant was asked to assess and rate only the first six domains presented on the SOT-PWI. Then, for the second vignette, the participant was asked to rate the next six domains on the scale, and so on, until all four vignette clients were rated, thus covering all domains on the SOT-PWI. This approach for assessment and rating was based on the feedback derived from pre-testing of the study materials, when it came to light that the reading and attentional capacities of potential study participants may vary widely, and the authors needed to control for and limit the possible decision-making fatigue of the study participants.

Data Analysis

The overall analytical strategy for achieving inter-rater reliability was based on the computation of intraclass correlation coefficient (ICC) when multiple raters (study participants) rated the same four case-vignettes using different domains for each vignette (Hallgren, 2012). The ICC is able to handle situations of multiple raters and the evaluation of different sets of scores (Gisev, Bell, & Chen, 2013). Several forms (models) of the ICC computation exist, and we applied a two-way random effects model (ICC, 2) with mean rating ($k=47$). The intent was to generalize the results to any raters who possess similar characteristics to the raters in the study, and all items are assessed by all the raters (Koo & Li, 2016). Based on the 95% confidence interval of the ICC estimate, ICC values less than 0.50, between 0.50 and 0.75, between 0.75 and 0.90, and greater than 0.90 are indicative of poor,

moderate, good, and excellent reliability, respectively. The ICC estimates were calculated using SPSS statistical package version 23 (Landers, 2015).

In addition, we conducted accuracy (validity) analysis based on examining errors that participants made in their assessment ratings. The correct preferred score for the domain was derived through pre-testing of the case-vignette contents. A voluntary advisory group composed of 10 seasoned pre-testers (with graduate degree education in social sciences and more than 5 years of practice experience with SOT populations) closely examined the match between the described contents in the vignettes and the conceptual rationale for the selected correct scores.

Since the SOT-PWI domains were scored along the 4-point Likert scale, and used the rating of “0” for missing information, the deviations from the correct assessment score could move along the +4 to -4 continuum. A deviation by 1 point (+1 or -1) from the correct rating was judged to represent a small (less concerning) error, and given an error score of 1.

Deviations of 2 points or more were perceived as “concerning errors” that could be associated with a variety of factors, including those tied to participants’ reading of the cases, education, training, or lack of work experience with SOT, and were given an error score of 2. Considering that participants scored 24 domains using the SOT-PWI matrix tool, then the participants’ total error scores could range from 0 to 48.

We hypothesized that a total error score range of 0–12 points would denote an excellent accuracy in ratings across all domains, 13–24 a reasonable accuracy, and 25–36 a fair accuracy, whereas total errors of 37 and higher would be suspect, or raise concerns about the accuracy of ratings. We also hypothesized that participants’ total error scores may be tied to their level of education and professional practice experience with the SOT populations. We tested these relationships with multiple regression analysis (MRA), while we controlled for participants’ ages, gender, and prior general experience in human service delivery apart from working with SOT. The statistical significance was set at alpha with $p < 0.05$ (Field, 2013).

Results

Findings for the SOT-PWI

As we were interested in the degree to which service providers may produce similar ratings or agreement for scoring individual case-vignettes, we computed ICC (2, 47) based on the random effects model with absolute agreement, and in this context, the raters’ effects and the measures effects were considered random. The interrater reliability total ICC score for the total SOT-PWI (based on summated score across the four case-vignettes) covering 24 life domains, produced total ICC = 0.98 (95% CI: 0.97–0.99), denoting an excellent level of agreement, or consistency among participants.

To better understand how participants rated the different individual SOT, we also examined ICC for each individual case-vignette (Table 2). Based on a close scrutiny of 95% confidence intervals in addition to the examination of the ICC coefficients (as recommended by (Koo & Li, 2016), findings revealed high ICC coefficients for cases 1 and 3, along with high confidence intervals (the lower bound 95% confidence interval being in the 0.96 to 0.97 range, respectively), thus denoting excellent reliability. Findings for cases 2 and 4, with more complex content descriptions of vignette SOT, revealed slightly lower yet still very positive results for the ICC coefficients, but the lower bound 95% confidence intervals showed a slight decrease (i.e., 0.85, and 0.93, respectively), suggesting a good to excellent level of reliability.

ICC Findings Based on Education Level

Grouping participants’ results based on their education levels revealed the following results for the total ICC score derived from total SOT-PWI

Table 2. Total ICC for each case with six domains on the SOT-PWI ($N = 47$).

Case-vignettes	ICC	95% confidence interval		F test with true value 0			
		Lower bound	Upper bound	Value	df1	df2	Sig.
Case 1	0.98	0.97	0.99	104.53	5	245	<0.001
Case 2	0.94	0.85	0.99	19.03	5	245	<0.001
Case 3	0.98	0.96	0.99	63.76	5	245	<0.001
Case 4	0.97	0.93	0.99	43.53	5	245	<0.001

ICC: intraclass correlation for a two-way random effects model for ICC (2, 47) with average absolute ratings.

Table 3. Total ICC for each case by providers' level of education ($N=47$).

Case-vignettes	BA – undergraduate level of education		MA – graduate level of education	
	ICC	95% confidence intervals	ICC	95% confidence intervals
Case 1	0.97	0.93–0.99	0.98	0.96–0.99
Case 2	0.79	0.48–0.96	0.94	0.95–0.99
Case 3	0.95	0.86–0.99	0.98	0.95–0.99
Case 4	0.85	0.60–0.97	0.98	0.96–0.99

ICC: Intraclass correlation for a two-way random effects model for ICC (2, 47) with average absolute ratings.

(based on summated score across the four case-vignettes): For undergraduate (BA) level, the total ICC = 0.93 (95% CI: 0.89–0.96), denoting a good level of reliability. For graduate (MA) level, the total ICC = 0.97 (95% CI = 0.96–0.99), denoting an excellent level of reliability.

To further understand how the education levels of participants may have influenced their assessment ratings of different vignette SOT, we examined results for each individual case-vignette (Table 3). Examining the interrater reliability for cases 1 and 3, the ICC coefficients and their 95% confidence intervals revealed that the BA-related interrater reliability ranged from good to excellent, and the MA-related interrater reliability was in the excellent range.

The inter-rater reliability for more complex cases 2 and 4 showed some slight differences. For the BA level educated group, the interrater reliability for case 2 ranged from poor to excellent (based on the 95% confidence intervals), and the interrater reliability for case 4 ranged from moderate to excellent reliability. In contrast, for the MA level educated group, the interrater reliability (both the coefficients and their 95% confidence intervals) was excellent for both cases 2 and 4. These results suggested that a participants' educational level may be implicated in their reliability ratings when the cases were somewhat more complex, and participants at the undergraduate level of education had slightly lower reliability across all cases when compared to participants with graduate level of education.

ICC Findings Based on Work Experience with SOT Populations

Results for participants' professional experience with SOT in direct care practice revealed the

following total ICC scores on the total SOT-PWI (based on the summated score across the four case-vignettes): Participants with 2 years or less of working experience with SOT showed total ICC = 0.92 (95% CI: 0.87–0.96), denoting a good to excellent range of interrater reliability. Participants with 3–5 years of working experience had total ICC = 0.93 (95% CI: 0.89–0.97), showing a good to excellent range of interrater reliability. Participants with 6 or more years of work experience with SOT populations had total ICC = 0.97 (95% CI: 0.96–0.99), an excellent level of interrater reliability.

Further examination of case-vignettes by three levels of work experience with SOT (Table 4) showed that case 1 showed a good to excellent reliability for the first two levels of experience and an excellent reliability for the third (highest level) of experience with SOT. Case 3 showed a good to excellent reliability for the lowest experience and then an excellent reliability for both higher levels of experience with SOT.

The reliability ICC results for cases 2 and 4 were more complex. For case 2, the reliability at the lowest level of experience with SOT was the weakest, and the lower bound 95% confidence interval value was well below the cutoff for a good reliability. The reliability for case 2 at the mid-level experience was a bit better, showing a moderate to excellent reliability. At the highest level of experience, case 2 showed a good to excellent level of reliability. For case 4, the reliabilities at the lowest and the mid-level of work experience with SOT were in the moderate to excellent reliability range, while at the highest level of experience, the reliability was again in the excellent range. Further examining the ICC results within each level of work experience seemed to show that case complexity may influence reliability ratings and participants with the lowest level of experience and with complex case contents had the lowest reliability ratings.

Findings Based on Error Analysis of Ratings

Addressing accuracy based on examining the distribution of total error scores made by participants (summated across all four cases-vignettes) revealed that on average, participants made

Table 4. Total ICC for each case by providers' work experience with SOT ($N = 47$).

Case-vignettes	Level 1 < 2 years		SOT work experience Level 2 3-5 years		Level 3 6+ years	
	ICC	95% confidence intervals	ICC	95% confidence intervals	ICC	95% confidence intervals
Case 1	0.95	0.89-0.99	0.95	0.86-0.99	0.98	0.96-0.99
Case 2	0.65	0.12-0.94	0.88	0.68-0.98	0.93	0.81-0.99
Case 3	0.93	0.83-0.99	0.97	0.91-0.99	0.96	0.90-0.99
Case 4	0.87	0.67-0.97	0.89	0.72-0.98	0.96	0.90-0.99

ICC: Intraclass correlation for a two-way random effects model for ICC (2, 47) with average absolute ratings.

around 4 errors across all 24 domains (Mean = 4.36, SD = 2.85), with a range of 0-12, demonstrating a very good accuracy in their ratings. Examining the distribution of errors for each domain (Table 5), revealed that only four domains had 10% or more of concerning errors: U.S. household functioning, support system abroad, support system in U.S., and spirituality. All other domains had 94% to 100% of their error scores spread over the 0 to 1 range.

Further, examining the effects of education and working experience with SOT populations using bivariate correlations demonstrated that participants' levels of education were not statistically significantly ($p > 0.05$) related to the total number of errors, whereas the levels of experience in working with SOT populations showed a statistically significant (bivariate) relationship ($p < 0.05$). Subsequently, both variables (education and two dummy-coded variables for work experience with SOT) were sequentially entered into a multiple regression analysis (MRA) after age, gender, and having prior other job experience (as control variables), and their prediction contribution to the number of total errors (dependent variable), was analyzed using a backward method for MRA analysis. The results produced a statistically significant model ($F(5, 46) = 2.59, p = 0.03$), and demonstrated that when participants' age, gender, and prior job history were controlled, their education did not statistically significantly predict the total number of errors, whereas their professional work level of experience with SOT populations did statistically significantly ($p < 0.05$) predict the total number of errors (Table 6).

Participants with the lowest level (≤ 2 years) of work experience with SOT made significantly more errors (Mean = 5.74, SD = 3.34) than participants with more work-related experiences with SOT. There was also no significant

Table 5. Distribution of participants' errors on SOT-PWI domains ($N = 47$).

SOT-PWI domain	0 error	1 error	2 + errors
Legal-immigration	89%	9%	2%
Food	85%	15%	0%
Housing	70%	28%	2%
U.S. Household functioning	70%	13%	17%
Material needs	98%	2%	0%
Language and communication	98%	2%	0%
Transportation	92%	8%	0%
Community safety	77%	17%	6%
Access to community resources	70%	27%	3%
Access to health care	92%	3%	5%
Physical health needs	70%	26%	4%
Mental health needs	94%	2%	4%
Functional ability	95%	5%	0%
Substance use	97%	3%	0%
Legal - other	70%	25%	5%
Employment	78%	19%	3%
Education-vocational training	87%	11%	2%
Income	96%	4%	0%
Support system abroad	72%	15%	13%
Support system in U.S.	75%	15%	10%
Spirituality	70%	20%	10%
Community involvement	87%	11%	2%
Parenting skills for own children in U.S.	87%	13%	0%
Childcare for own children in U.S.	70%	15%	5%

Error rates for 0 or 1 error were considered in good standing, while 2+ errors were deemed of concern.

Table 6. MRA - participants' characteristics predicting total error score ($N = 47$).

Predictor variable	<i>r</i>	Unstandardized b (SE)	Standardized beta	<i>t</i>	<i>p</i>
Age	-0.16	-0.05 (0.54)	-0.014	-0.09	0.92
Gender	0.29*	1.87 (1.06)	0.205	1.39	0.18
Other job	-0.15	-0.58 (0.11)	-0.151	-1.01	0.34
Education ^a	-0.09	-0.03 (0.46)	-0.002	-0.01	0.98
Work level d1 ^b	0.40*	2.43 (0.97)	0.422	2.51	0.02*
Work level d2 ^c	-0.16	0.33 (1.11)	-0.052	0.30	0.77

* $p < 0.05$; Constant = 3.39; $r^2 = 0.24$ (Adj. $r^2 = 0.15$); Gender: 0 = Male.

aEducation: BA = 0, MA = 1.

bWork-level dummy 1: 1 = Less than 2 years of experience with SOT;

cWork-level dummy 2: 1 = 3-5 years of experience with SOT, and Work Level dummy 3 (coded 0) served as the contrast category with 6+ years of experience.

difference in the total number of errors between work experience level 2 (Mean = 3.50, SD 2.37) and level 3 (Mean = 3.39, SD = 1.94), or between participants with work experience of 3-5 years and those with 6+ years.

Discussion

This study subjected the SOT-PWI, a newly developed matrix instrument, to a systematic

investigation of interrater reliability, a necessary process of measurement of the tool's validity.

The study examined both the consistency across professional providers (raters) by using ICC results, and the accuracy of the providers, by examining their error results compared to consensus ratings determined by an advisory group with practice experience in the field with SOT populations.

The overall findings suggest that SOT-PWI can be applied to capture reliable information by professional providers with experience delivering services to different SOT populations. SOT-PWI is constructed in a way that direct care providers are able to obtain consistent and objective ratings of 24 life domains in human functioning. All total ICCs were in the excellent range of reliability, and the providers achieved a consistency of 98% overall. By case complexity specification, the providers' total scores also ranged from good to excellent, supporting interrater agreement across providers.

Further considering the range of errors that providers could make across all domains, the average total error rate was low. In particular, most errors were small and less concerning types of errors in the 0–1 deviation error range: i.e., on 20 domains of the SOT-PWI, most (94–100%) providers made a very small or less concerning error (in a 0–1 range deviation). Only four domains on the SOT-PWI had concerning type of errors in which providers made 10% or more deviation errors. On the whole, the overall ICC related results and the accuracy of the providers both support the findings that the SOT-PWI is a tool with a solid reliability.

However, refining results by providers' level of education and professional work experience suggests that the providers' knowledge and training can matter. When reliability ICCs were considered by possible effects derived from the providers' levels of education and work experience with SOT populations, the results suggested that having less than a graduate level of education, or having less than 3 years of working experience with SOT, may lower provider consistency in assessment ratings, and particularly, when client case contexts become more complex (as were the contents for cases 2 and 4 in the

vignette presentations). Professional work experience with SOT populations played a particularly significant role in the prediction of total number of errors that providers made, further suggesting that direct practice experience matters in objective assessments.

Because matrix scales are typically not set up or structured by directing or requiring the user to ask specific questions in a specific format, matrix scales used for the assessment of human psychosocial needs depend heavily on the providers' acquired knowledge and training. In other words, matrix scales depend on knowledge of human behavior that is integrated with professional practice experience in being able to know: e.g., how to ask questions regarding client well-being in different life domains, which questions to ask first or second in order to distinguish between different degrees of severity of a problem or an issue, and when to ask questions or when to wait and ask questions later, and then, how to problem-solve client life domains specifically with different types of SOT populations. Results of this study specifically suggest that professional practice experience may be particularly important for professional providers who are new to delivering direct care services to SOT populations, and who are using the SOT-PWI for assessment, monitoring, and evaluation of client services. In this context, using case studies as a training mechanism to strengthen newish providers' competencies and consistent application of the SOT-PWI should be an important consideration for deploying the SOT-PWI tool in the field.

Study Limitations, and Future Directions

The findings of the study must also be considered in light of methodological limitations. The results are based on a unique sample of direct care professional providers, somewhat limiting the generalizability of the findings, although the participants came from a pool of typical providers to SOT populations, albeit self-selected. The assessment ratings with SOT-PWI tool were based on reading distinct case-vignettes at one point of time rather than actual experiential assessments with live clients over time. Therefore, the findings could have been influenced by study participants'

intrinsic reading skills, the length of time it took to read cases, and individual problem-solving approaches that can further contribute to providers' client-level decision-making in addressing client needs. However, since reading and general problem-solving both tend to be associated with educational achievement in practice, it is less likely that such intrinsic issues compromised the results of ratings when participants' education and work experience with SOT were taken into account. However, future research should examine the providers' problem-solving style or coping approach with various task complexities, as research suggests that proactive problem-solving or approach to coping in decision-making is an important component of employee's resourcefulness, responsibility, and vision, all of which can contribute to employee work competence (Alegre, Mas-Machuca, & Berbegal-Mirabent, 2016; Spector, 2017), and thus also to the application of the SOT-PWI in client assessments and subsequent service delivery.

To the study's credit, the case-vignettes were constructed with pretesting input of experienced providers in the field of practice, and the contents also provided a range of complexity and described circumstances based on accepted conceptualizations of torture and persecution experiences of asylum seekers (United Nations, 1984), while adhering to the U.S. legal definition of torture. Also on the positive side, the accuracy of ratings was based on the pretesting input of an experienced advisory group of providers with SOT populations, although this group was small. In addition, the four case-vignettes attempted to represent typical SOT-clients with varying levels of need. However, such needs in live contexts are often even more complex and unfold over time, rather than in the cross-sectional design context of the study.

In the future, it will be important to study the performance of the SOT-PWI in outcome assessment with live SOT-clients and with a format that collects assessments longitudinally. In addition, future investigations need to examine correlations and associations between SOT-PWI selected domain-outcomes and other standardized measures or scales used for the assessment of

different domains of human wellbeing as a way to cross-validate the SOT-PWI domains, and with different cultural groups of SOT populations as well.

Practice Implications and Conclusion

Social workers and other torture treatment professional providers delivering direct care services to SOT populations must pay attention to the unique aspects of the holistic needs of SOT, as such needs may affect the wellbeing outcomes of SOT and impede their utilization of care as well. To assist with the needs-related assessment process, the SOT-PWI matrix tool offers a broad range of life domains that cover a comprehensive set of factors known to influence the human psychosocial functioning, health and mental health, and cultural adaptation during the post-immigration phase of SOT. The SOT-PWI also offers an easy way to score assessments for each domain, applying an easy to interpret 4-point graduated scoring system. The changes in individual domains and in the total score for the SOT-PWI can be applied to track, monitor, and evaluate individual client outcomes over time, and can also be used for comparing outcomes for different groups of SOT populations. In conclusion, this study demonstrates that the SOT-PWI is well constructed and sufficiently objective to obtain reliable and valid assessment of adult psychosocial wellbeing in the SOT populations.

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