

Article

# Workplace Assessment Scale: Pilot Validation Study

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**Abstract:** First responders, such as police officers, paramedics, and fire-fighters are at an increased risk of experiencing negative mental health outcomes compared to the general population. This predisposition can partially be attributed to common occupational stressors, such as poor workplace culture and mistreatment from leadership, which may provoke strong feelings of betrayal and humiliation. The Workplace Assessment Scale (WAS) was developed as there is currently no appropriate measure to assess such feelings in the first responder population. The scale consists of the Betrayal Subscale and the Humiliation Subscale, each comprised of 5 Likert scale questions which ask participants to report the frequency at which they experience specific feelings associated with their workplace. This pilot validation study was conducted to assess preliminary reliability and validity of the WAS, using data which was originally collected as part of a larger first responder-based observational study. Based on 21/22 (95%) participant responses, the internal consistency appeared to be strong for both sub-scales as well as the overall questionnaire. However, item 9 will likely require modification or deletion from the scale. The validity analysis found no significant correlations between WAS and other psychiatric scales. Additional research is needed for further analysis and validation of the WAS.

**Keywords:** scale design; reliability; validity; first responders; mental health; workplace; occupational stress; humiliation; betrayal

## 1. Introduction

First responders, such as firefighters, paramedics, and police officers, protect the safety and security of the public by being among the first to arrive and provide assistance at a scene of an emergency [1]. Due to the nature of their role, first responders are at increased risk of exposure to potentially psychologically traumatizing events (PPTE), such as sudden or accidental death, serious on-road accidents, and physical assault, where they may be both a witness and victim [2]. As a result, first responders are at increased risk of negative mental health outcomes compared to the general population. A survey of Canadian public safety personnel, which includes first responders, by Carleton et al. found a positive correlation between high or repeated incidence of exposure to PPTE and the odds of screening positive for post-traumatic stress disorder (PTSD), major depressive disorder (MDD), panic disorder (PD), and generalized anxiety disorder (GAD), establishing a dose-response relationship [2].

While the mental health burden on individuals of workplace exposure to PPTE is an active area of research, there has been little attention paid to how public safety occupational factors contribute to mental disorders. Occupational stressors can be categorized

into firstly operational stressors, which stem directly from work-related duties, such as shift work, over-time, work-related injury, and strain of job on work-life balance. Secondly, there are organizational stressors, which relate to the job environment and culture, such as co-worker dynamic, treatment from leadership, staff shortages, barriers to accessing help or insurance, and lack of training [2]. In a recent qualitative study, Ricciardelli et al. identified the occupational stressors which most significantly impacted first responder mental health. One of the major themes identified was interpersonal work relationship dynamics “where employees feel supervisors or upper management treat them poorly, unfairly, or negatively, particularly in instances where relationships of power underpin the perceived treatment” [3]. The participants in this study identified that PPTe exposure was not a primary source of stress, rather it was the witnessed or personal experience of repeated mistreatment from leadership. Similar findings were described by Carleton et al. in their analysis of self-reported mental health outcomes among Canadian public safety personnel [2]. Even after controlling for exposure to PPTe, occupational stressors were found to be moderately to strongly associated with mental disorders. One of the two organizational stressors with the highest odds ratios was “believing that you always have to prove yourself to the organization”.

These organizational stressors may provoke strong feelings of betrayal and humiliation amongst the first responder population, resulting in experiences of institutional betrayal and embitterment. Institutional betrayal refers to the deliberate negligence or failure of a trusted institution to respond appropriately to negative experiences [4, 5]. Consequently, the members who rely on such institutions for support, protection, and resources often experience a violation of trust [5]. Embitterment may also result as a consequence of institutional betrayal. It refers to the inclination to undo an experience, reinstate justice, or take revenge after an experience of humiliation, a breach of trust, or injustice [6]. Experiences of institutional betrayal and embitterment have been studied in systems including university campuses where sexual assault has occurred, in the Canadian medical system, and in the military but never before in first responder organizations [4, 6-8].

First responders who have sought care at an Occupation Stress Injury clinic in Ottawa, Canada, have described feelings of betrayal and humiliation as a result of experiencing occupational stressors (See Supplementary File S1 for complete vignettes).

In this first vignette, Jane, a first responder who has been with the service for 21 years describes feeling abandoned by her organization after going on sick leave for a post-traumatic stress injury:

*“I have been a first responder passionately serving several communities for over 21 years. For me the ‘iceberg’ moment was one year ago when I took up a new position. I had safety concerns about what I was being asked to do but management did not support my concerns. My supervisor turned up unannounced at work and was relentlessly antagonizing, yelling at me, and berating me in front of my team and the public. I was condemned for my ‘unprofessional behaviour’ and told that I would have to attend a mandatory disciplinary meeting. I was emotionally devastated so I went off on sick leave.*

*The return-to-work process was hostile and difficult. My employer refused to give me any modified duties. I was told I had to return to full duties or not return at all. On my first shift back to work, my employer sent me an email with an “Exit Package” asking me to consider leaving the organization. This sent me into a deep depression, and I lost myself completely. I struggled to even get out of bed. So, once again I was forced to go off on sick leave. Upon my return from this second leave, I was sent an email stating I had to attend a performance review for disciplinary action where I had my integrity and professionalism questioned. I felt immediately vulnerable and felt attacked.*

*Now, here I am off work again feeling completely defeated, worthless, and abandoned. I have lost all the confidence I once had. I feel completely unsafe in my workplace and worry constantly that they will find a way to fire me. I feel like a fool for being so dedicated thinking it was valued and appreciated. So stupid for thinking that my employer would be there to support me. How can first responders possibly continue to fight the daily battles out on the frontlines when there is this lethal battle going on behind the scenes?”*

Similarly, Mark speaks to the mental health impacts of a 20-year career as a first responder. He describes being targeted for dismissal by their employer while they were on sick leave. The resultant feelings of betrayal had a significant impact on his recovery:

*“My story started in April 2001 which was when I started my career as a first responder. I was excited to be part of something that I was missing in my life, a family. The service became my family, and it would consume my life. The brotherhood and sisterhood that I was part of became the most important part of my life.*

*Over the course of 20 years, I worked alongside my colleagues witnessing some of the worst calls I could've imagined. I didn't know it at the time, but the accumulation of these calls would later lead to my Post Traumatic Stress Injury. I became very depressed after 20 years of being on the job, and I was ashamed to admit that I had a problem. PTSD impacted my sleep, I became very angry around people, I started drinking alcohol heavily and I started having a fascination with committing suicide.*

*After years of feeling this way, I went off of work. My employer started coming after me with policy violations. They accused me invalid notebook entries, using a force vehicle for personal use, obtaining unsanctioned car washes, and improper time scheduling. As a result of these accusations, the employer wants to dismiss me from work. I felt targeted, betrayed and hated. My colleagues turned their backs on me. People I was close to wouldn't even acknowledge me in public. I've been in therapy dealing with my PTSD for over a year now. I have accepted the fact that I can't be a first responder anymore, and I'm good with this decision, but the actions of my organization have had a tremendous negative impact on my rehab.”*

Identifying actionable opportunities for organizational change may be more feasible than trying to reduce exposure to PTTE or manage their impact. Measures targeting first responder occupational stressors have been developed, such as the Police Stress Survey (1989) and the Police Daily Hassles (1993) [9-10]. More recently, two condensed scales, the Organizational Police Stress Questionnaire (PSQ-Org) and Operational Police Stress Questionnaire (PSQ-Op), were developed [11]. However, these scales were not designed to capture feelings of betrayal and humiliation as they primarily ask participants to identify which stressors have impacted them most. Additional limitations to these scales include survey burden due to the length of the scale as well as the failure to consider the experiences of first responder professions other than police officers [11].

Scales assessing institutional betrayal have also been developed. However, the scales are context specific and inappropriate for use in the first responder population. The Institutional Betrayal Questionnaire (IBQ) was first developed to measure institutional betrayal in individuals who have experienced sexual assault [4]. Since then, the scale has been adapted to assess institutional betrayal in additional settings: IBQ-Health measures institutional betrayal in healthcare systems, IBQ-Climate measures institutional betrayal in school settings, and IBQ-Covid measures experiences regarding institutional protocols and policies regarding COVID-19 [12-14]. There is currently no appropriate scale to assess feelings of betrayal, humiliation, or embitterment in the first responder population.

The burden of occupational stressors and the significance of betrayal and embitterment have been highlighted in the literature and by first responders themselves. However, the lack of an appropriate measure to assess the impact of such stressors reveals a clear gap in evidence for the treatment and prevention of mental health disorders in first responders. This study describes the development and pilot validity of a novel self-report scale to measure workplace satisfaction.

## 2. Materials and Methods

### 2.1. Objectives

The current study is a preliminary validation study which assessed the internal consistency, convergent validity, and criterion validity of the novel Workplace Assessment Scale (WAS). The WAS is an instrument we developed to measure workplace satisfaction in the first responder population, motivated by the need expressed by first responders

and a gap in the literature as highlighted above. This secondary analysis was conducted using data which was originally collected as part of an observational study that assessed the acceptability of a first responder mental health clinic and associated mental health team in Ottawa, Canada.

### 2.2. Study Design and Participant Recruitment

From September 2020 to June 2021, participants for the observational study were recruited from the First Responder Clinic at The Ottawa Hospital and from the Ottawa Paramedic Service. All study participants were at least 18 years old, fluent in English and/or French, and were employees of either Ottawa Fire Service, Ottawa Paramedic Service, or Ottawa Police Service. All participants provided verbal informed consent and have been included in the current secondary analysis.

### 2.3. Measures

A broad variety of psychiatric assessments were included in this pilot validation study to assess the criterion validity of the WAS. The WAS and the Maslach Burnout Inventory (Human Services Survey) were administered at baseline only. All other psychiatric assessments included in this preliminary investigation were administered at baseline and at the 12-week follow-up. The description of WAS and the psychometric properties of each of the additional measures are discussed below. The complete list of psychiatric measures included in the original study and their timing of administration are outlined in Supplementary Table S1.

**The Workplace Assessment Scale (WAS):** The WAS is a 10-item self-report scale assessing an individual's feelings towards their workplace over the past week (Supplementary File S2). For each item, participants are asked to indicate the frequency at which they experienced specific feelings on a Likert scale from 0 to 3 (not at all, occasionally, a lot of the time, or most of the time). The WAS is comprised of two subscales, the Betrayal and Humiliation subscales, which are made up of the odd- and even- numbered items, respectively. Total scores for each subscale range from 0 to 15, summing up to an overall WAS score of 0-30. A higher total WAS score indicates a greater sense of dissatisfaction with one's workplace. The Oxford English Dictionary definitions of betrayal and humiliate were used to guide the development of this scale. Betrayal is defined as a "violation of trust or confidence, an abandonment of something committed to one's charge" [15]. The betrayal subscale measures feelings of abandonment (Q1, Q5), confidence (Q3, Q9), and trust (Q7). To humiliate is defined as an act "to lower or depress the dignity or self-respect of; to subject to humiliation; to mortify" [16]. The humiliation subscale assessed feelings of anger (Q2), a sense of value (Q4), embarrassment (Q6), humiliation (Q8), and potential mistreatment (Q10).

**Maslach Burnout Inventory – Human Services Survey (MBI-HSS):** The MBI-HSS is a 22-item self-report scale which examines feelings of burnout in Human Services professions, such as first responder, nurses, and social workers. Initial validation of the MBI showed good internal consistency with a Cronbach's alpha of 0.83 (frequency) and 0.84 (intensity). Coefficients for test-retest reliability for all subscales surpassed significance ( $p < 0.001$ ) [17].

**Workplace Productivity and Impairment Questionnaire: General Health (WPAI:GH):** The WPAI:GH is a 6-item self-report that measures the impact of an individual's health concerns, including mental health, over the previous seven days. The first portion of the scale assesses absenteeism, the extent of work time missed, while the latter portion assesses productivity, the impairment of professional and non-work-related activities. The WPAI:GH shows good test-rest reliability (less than 5% difference over 12 months) and good convergent validity across multiple chronic health conditions [18-19].

**PTSD for DSM-5 Checklist (PCL-5):** The PCL-5 is a 20-item self-report measure that assesses the presence and severity of PTSD symptoms, corresponding with DSM-5 criteria for PTSD. PCL-5 scores exhibit strong internal consistency ( $\alpha = .94$ ), test-retest reliability ( $r = .82$ ), and convergent ( $r_s = .74$  to  $.85$ ) and discriminant ( $r_s = .31$  to  $.60$ ) validity [20].

**Patient Health Questionnaire - 9 (PHQ-9):** The PHQ-9 is a 9-item self-report that assesses the severity of depression symptoms experienced within the last two weeks. Participants are asked to rate each symptom of depression on a Likert scale of "0" (not at all) to "3" (nearly every day), with total scores ranging from 0 (minimal depression) to 27 (severe depression). The PHQ-9 has strong methodological properties with a high sensitivity (0.77) and specificity (0.94) [21].

**General Anxiety Disorder - 7 (GAD-7):** The GAD-7 is a 7-item self-report that assesses the severity of anxiety symptoms experienced within the last two weeks. Participants rate each symptom on a Likert scale of "0" (not at all) to "3" (nearly every day), with total scores ranging from 0 (minimal anxiety) to 21 (severe anxiety). The initial validation study, conducted by Spitzer et al. (2006), demonstrated high internal consistency ( $\alpha=0.92$ ) and test-retest reliability (intraclass correlation = 0.83) [22].

**Alcohol Use Disorders Identification Test (AUDIT):** The AUDIT is a 10-item self-report designed to assess alcohol consumption, drinking behavior, adverse reactions, and alcohol-related problems. A score of 8 or higher is considered indicative of hazardous drinking. The AUDIT has demonstrated high internal consistency ( $\alpha=0.94$ ) as well as high sensitivity ( $>0.80$ ) and specificity ( $>0.80$ ) in a variety of populations and languages [23].

**The Drug Abuse Screening Test - 10 (DAST-10):** The DAST-10 is a 10-item self-report that assesses drug abuse within the last 12 months. The total possible scores on this instrument range from 0 to 10, with higher scores indicating a greater likelihood of a substance use problem. The DAST-10 has been evaluated among psychiatric patients and has been found to have high internal consistency ( $\alpha=0.94$ ) and a test-retest reliability score of 0.71 [24].

**Warwick Edinburgh Mental Wellbeing Scale (WEMWBS) (short version):** The WEMWBS is a 14-item self-report which measures multiple aspects of mental wellbeing over the last two weeks. Higher scores on the scale indicate greater feelings of wellbeing. Validation of the scale showed good internal consistency ( $\alpha=0.91$  for general population) and test-retest reliability at one week was high (0.83) [25].

#### 2.4. Statistical Analysis

IBM Statistical Package for the Social Sciences (SPSS) Version 27.0 was used for all statistical analyses conducted in this study. To characterize the participant sample, descriptive statistics are presented as mean (SD) for continuous variables and absolute values with percentages for categorical variables. Statistical tests for reliability and validity are described below.

#### 2.5. Reliability Analysis

Internal consistency of the WAS questionnaire and its subscales were determined using Cronbach's alpha. A threshold of 0.70 was used to indicate strong validity [26]. Item means, corrected item-to-total correlations (i.e., the correlation between an individual item and the total score without that item), Cronbach's alpha if item deleted, and inter-item correlations were also obtained from the reliability analysis. A corrected item-total correlation of  $<0.30$  was the threshold value used to indicate an item as a candidate for deletion [27]. List-wise deletion was used to calculate reliability statistics.

## 2.6. Validity Analysis

The convergent and criterion validity of the WAS were assessed in this study. To assess convergent validity, Spearman's rank correlation coefficient was used to calculate inter-scale correlations between the Betrayal and Humiliation subscales and between the subscales and the total WAS score.

Analysis for concurrent and predictive validity was conducted by calculating Spearman's rank correlation coefficient between baseline WAS scores and scores on a pre-determined subset of relevant scales at baseline and at 12-weeks which included the MBI-HSS, PHQ-9, GAD-7, AUDIT, DAST-10, WPAI, and WEMWBS. Scores on question 2 of the absenteeism portion of the WPAI was used to calculate the correlation between the WAS and absenteeism. Total scores were calculated for all other pre-determined scales for the correlation analysis.

Weak, moderate, and strong correlations were indicated as  $\leq 0.39$ , 0.40-0.69, and  $\geq 0.70$  respectively [28]. Pair-wise deletion was used to calculate all correlation statistics. An overall 5% type I error level was used to infer statistical significance.

## 3. Results

### 3.1. Participant Characteristics

A total of 22 participants were enrolled in the study. Demographic data of the sample is outlined in Table 1. Gender distribution of study participants was nearly balanced, with 54.5% of participants identifying as male and 45.5% of participants as female. No participants identified as trans-gender or gender non-conforming. The age range of participants was 23-63 years, with a mean age of 40.5 years (SD 9.6 years). It is important to note that all participants self-identified as White. Participants primarily belonged to Ottawa Paramedic Services (19/22, 86.4%), followed by Ottawa Fire Services (2/22, 9.1%), and Ottawa Police Services (1/22, 4.5%) The majority of study participants (15/22, 68.2%) were working full-time at entry into the study, while 31.8% (7/22) were on leave. No participants had less than a college diploma.

**Table 1.** Participant Characteristics (n=22)

Demographics	Frequency n (%)
<b>Gender</b>	
Male	12 (54.5)
Female	10 (45.5)
<b>Age</b>	
Range	23-63
Mean, SD	40.50 (9.6)
<b>Marital Status</b>	
Common Law	7 (31.8)
Married	8 (36.4)
Single	3 (13.6)
Divorced	2 (9.1)
Widowed	1 (4.5)
Prefer not to answer	1 (4.5)
<b>Ethnicity</b>	
Caucasian	22 (100)
<b>Education</b>	
College diploma	16 (72.7)
University/Bachelor's degree	6 (27.3)
<b>Service</b>	
Ottawa Paramedic Service	19 (86.4)
Ottawa Fire Service	2 (9.1)
Ottawa Police Service	1 (4.5)
<b>Employment Status</b>	
Full-time	15 (68.2)

Currently on leave	7 (31.8)
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### 3.2. Internal Consistency

The WAS was completed by 21/22 (95%) participants, but only 18 of the 21 participants (86%) provided responses to all items of the questionnaire. Overall, the WAS demonstrated strong internal consistency, with a Cronbach's alpha of 0.876 for the Betrayal Subscale, 0.889 for the Humiliation Subscale, and 0.932 for the full WAS. The reliability statistics of both subscales and the overall WAS scale are outlined in Table 2, including item means, corrected item-total correlations, and Cronbach's alpha if item deleted. Inter-item correlations are also described in Table 3 (Betrayal subscale), Table 4 (Humiliation subscale), and Table 5 (total WAS).

The internal consistency of the Betrayal Subscale was strong with a Cronbach's alpha of 0.876 (n=19). Apart from question 9, all items on the Betrayal Subscale displayed high corrected item-total scores, ranging from 0.707 to 0.902, and high inter-item correlations, ranging from 0.633 to 0.878. Item 9 had a weak corrected item-total correlation of 0.324 and was also weakly correlated with other items of the subscale with its inter-item correlations ranging from 0.156 to 0.448. The deletion of each item resulted in a decrease in the value of Cronbach's alpha, except for question 9, which increased the value of Cronbach's alpha by 0.051, from 0.876 to 0.927. The corrected item-total correlations of all items in this subscale exceeded the threshold value as the correlations ranged from 0.324 (Q9) to 0.902 (Q5).

The internal consistency of the Humiliation Subscale was also strong with a Cronbach's alpha of 0.889 (n=18). The strength of correlations between subscale items were moderate to strong as the inter-item correlations ranged from 0.404 to 0.798. The deletion of any item within the Humiliation subscale decreased the value of Cronbach's alpha. The corrected item-total correlations, ranging from 0.652 to 0.850, were strong for all items in the Humiliation subscale. Thus, none of the items were considered for deletion.

Similarly, the internal consistency of the overall WAS was strong with a Cronbach's alpha of 0.932 (n=18). Without question 9, corrected item-total correlations of the WAS scale ranged from 0.665 to 0.892 and inter-item correlations ranged from 0.257 to 0.870. Deletion of question 9 in the WAS resulted in a 0.002 increase in the value of Cronbach's alpha, from 0.932 to 0.934. Apart from Q9, deletion of any other item resulted in a decrease in the value of Cronbach's alpha for the overall WAS questionnaire. Similar to the two subscales, all corrected item-total correlations exceeded the threshold value of 0.30. The corrected item-total correlations ranged from 0.552 (Q9) to 0.892 (Q2) and no items were considered for deletion using this criterion.

**Table 2.** Reliability Statistics for the WAS

Item	WAS Total			WAS Betrayal			WAS Humiliation		
	Item mean (SD)	Corrected item-total correlation	Cronbach's alpha if item deleted	Item mean (SD)	Corrected item-total correlation	Cronbach's alpha if item deleted	Item mean (SD)	Corrected item-total correlation	Cronbach's alpha if item deleted
Q1	2.06 (0.873)	0.708	0.926	2.11 (0.875)	0.809	0.825	-	-	-
Q2	1.39 (0.850)	0.892	0.918	-	-	-	1.39 (0.850)	0.850	0.841
Q3	1.89 (1.023)	0.676	0.929	1.95 (1.026)	0.707	0.851	-	-	-
Q4	2.11 (0.758)	0.738	0.926	-	-	-	2.11 (0.758)	0.683	0.878
Q5	1.72 (1.018)	0.841	0.919	1.79 (1.032)	0.902	0.795	-	-	-
Q6	1.17 (1.200)	0.829	0.921	-	-	-	1.17 (1.200)	0.843	0.843
Q7	2.17 (0.786)	0.825	0.922	2.21 (0.787)	0.854	0.820	-	-	-
Q8	0.56 (0.922)	0.671	0.928	-	-	-	0.56 (0.922)	0.652	0.882
Q9	0.39 (0.850)	0.552	0.934	0.42 (0.838)	0.324	0.927	-	-	-

Q1	0.61 (0.916)	0.665	0.929	-	-	-	0.61 (0.916)	0.687	0.874
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**Table 3.** Inter-item correlations on the Betrayal Subscale (n=19)

	Item 1	Item 3	Item 5	Item 7	Item 9
Item 1	-				
Item 3	0.749	-			
Item 5	0.826	0.776	-		
Item 7	0.772	0.633	0.878	-	
Item 9	0.239	0.156	0.365	0.448	-

**Table 4.** Inter-item correlations on the Humiliation Subscale (n=18)

	Item 2	Item 4	Item 6	Item 8	Item 10
Item 2	-				
Item 4	0.750	-			
Item 6	0.798	0.754	-		
Item 8	0.534	0.411	0.656	-	
Item 10	0.734	0.404	0.597	0.619	-

**Table 5.** Inter-item correlations on the WAS (n=18)

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Q1 <sup>a</sup>	-									
Q2 <sup>b</sup>	0.683	-								
Q3 <sup>a</sup>	0.732	0.797	-							
Q4 <sup>b</sup>	0.612	0.750	0.699	-						
Q5 <sup>a</sup>	0.813	0.744	0.760	0.652	-					
Q6 <sup>b</sup>	0.522	0.798	0.591	0.754	0.714	-				
Q7 <sup>a</sup>	0.758	0.690	0.610	0.658	0.870	0.717	-			
Q8 <sup>b</sup>	0.325	0.534	0.257	0.411	0.550	0.656	0.595	-		
Q9 <sup>a</sup>	0.207	0.511	0.120	0.294	0.336	0.509	0.426	0.909	-	
Q10 <sup>b</sup>	0.396	0.734	0.328	0.404	0.508	0.597	0.504	0.619	0.734	-

<sup>a</sup> WAS Betrayal Subscale Items

<sup>b</sup> WAS Humiliation Subscale Items

### 3.3. Validity

Strong convergent validity was demonstrated between the Betrayal and Humiliation subscales ( $\rho=0.854$ ,  $p<0.001$ ). The correlations between total WAS scores and the subscales were also significant (Betrayal:  $\rho=0.967$ ,  $p<0.001$ , Humiliation  $\rho=0.952$ ,  $p<0.001$ ). These results support the notion that both subscales are measuring the same construct. The inter-scale correlations are indicated in Table 6.

**Table 6.** WAS Inter-scale correlations

	WAS Total	WAS Betrayal	WAS Humiliation
WAS Total	1.000	-	-
WAS Betrayal	<b>0.967 (p&lt;0.001)</b>	1.000	-
WAS Humiliation	<b>0.952 (p&lt;0.001)</b>	<b>0.854 (p&lt;0.001)</b>	1.000

Baseline total WAS scores were found to be significantly correlated with baseline scores on the MBI-HSS ( $\rho=0.561$ ,  $p=0.037$ ), with increased burnout scores associated with increased workplace dissatisfaction. No other significant correlations were found between subscales or overall WAS scores with other measures included in the study. The median, range, correlations and total n correlations for all included outcomes are outlined Table 7.

**Table 7.** Correlations between the WAS and other mental health outcome measures

	Median, Range, n	Spearman's Correlation Results		
		WAS Total $\rho$ (p-value), n	WAS Betrayal $\rho$ (p-value), n	WAS Humiliation $\rho$ (p-value), n
<b>MBI-HSS</b>				
Baseline	85, 51-109, 16	<b>0.561 (p=0.037), 14</b>	0.486 (p=0.066), 15	0.513 (p=0.061), 15
<b>WPAI-Absenteeism</b>				
Baseline	0, 0-42, 18	0.056 (p=0.837), 16	-0.010 (p=0.970), 16	0.121, (p=0.656), 16
Week 12	0, 0-84, 13	0.286 (p=0.393), 11	0.406, (p=0.215), 11	0.162, (p=0.635), 11
<b>PCL-5</b>				
Baseline	28.5, 1-72, 20	0.007 (p=0.979), 17	0.111 (p=0.662), 18	0.032 (p=0.904), 17
Week 12	25, 11-71, 17	-0.288 (p=0.318), 14	-0.203 (p=0.486), 14	-0.264 (p=0.362), 14
<b>PHQ-9</b>				
Baseline	11, 3-18, 21	0.355 (p=0.163), 17	0.366 (p=0.135), 18	0.451 (p=0.070), 17
Week 12	8.5, 3-27, 16	-0.193 (p=0.527), 13	-0.260 (p=0.390), 13	-0.007 (p=0.982), 13
<b>GAD-7</b>				
Baseline	7, 0-19, 22	-0.127 (p=0.616), 18	-0.067 (p=0.785), 19	-0.108 (p=0.669), 18
Week 12	10, 3-21, 16	-0.046 (p=0.881), 13	0.034 (p=0.913), 13	-0.063 (p=0.839), 13
<b>AUDIT</b>				
Baseline	2.5, 1-10, 18	-0.152 (p=0.574), 16	-0.152 (p=0.560), 17	-0.284 (p=0.286), 16
Week 12	3, 1-12, 15	-0.161 (p=0.581), 14	0.041 (p=0.890), 14	-0.343 (p=0.230), 14
<b>DAST-10</b>				
Baseline	1, 0-2, 14	-0.464 (p=0.150), 11	-0.265 (p=0.431), 11	-0.571 (p=0.067), 11
Week 12	0, 0-3, 9	-0.353 (p=0.391), 8	-0.517 (p=0.189), 8	-0.192 (p=0.649), 8
<b>WPAI Productivity</b>				
Baseline	5, 0-15, 19	0.192 (p=0.493), 15	0.343 (p=0.193), 16	0.180 (p=0.522), 15
Week 12	3, 0-12, 9	-0.445 (p=0.317), 7	-0.491 (p=0.264), 7	-0.350 (p=0.442), 7
<b>WEMWBS</b>				
Baseline	42.5, 24-64, 22	-0.061 (p=0.809), 18	-0.159 (p=0.515), 19	-0.112 (p=0.658), 18
Week 12	41, 25-54, 17	0.320 (p=0.265), 14	0.267 (p=0.356), 14	0.286 (p=0.321), 14

### 3.4. Completion Rate

The WAS was completed by 21/22 (95%) participants. One participant, who was on leave during the relevant timeframe, did not complete the WAS as they felt that the questions were not applicable to them at this time. Of the 21 participants who did complete the WAS, questions 1-7 and 10 were answered 100% of the time, while question 8 was only responded to 86% of the time (18/21) and question 9 90% of the time (19/21).

## 4. Discussion

This preliminary validation study investigated the internal consistency and validity of the WAS. Internal consistency appeared to be strong for the Betrayal Subscale, Humiliation Subscale, and the overall questionnaire. However, item 9 was found to have weak corrected item-total and inter-item correlations and was the only item to yield an increase in Cronbach's alpha if deleted. This suggests that item 9 will likely require modification or deletion from the scale as it is likely not assessing the same construct as the other items of the scale. High inter-scale correlations between the two subscales as well as between each subscale and the total WAS score suggest strong convergent validity of the WAS. There were no significant correlations between total WAS scores and participant scores

on other psychiatric measures, with the exception of the burnout inventory. Given this, our preliminary results support that the WAS is a valid measure to assess feelings of humiliation and betrayal related to organizational stressors.

Despite previous work by Carleton et al. describing strong associations between occupational stressors and negative mental health outcomes, our study found no correlations between measures for MDD, GAD and PTSD [2]. One potential explanation for this is that the survey completed by Carleton et al. used self-report measures, which likely overestimate the prevalence of common mental disorders [29-30]. Another potential explanation for this discrepancy is the recruitment of a sample which may not be actively experiencing mental health disorders. While our study used both self-report and observer-rated assessments, over half of our sample was experiencing mild or no symptoms of depression, anxiety or PTSD. Only three participants had potentially hazardous drinking behaviour and no participants had substance misuse. Repeating the correlational analysis with a larger sample of participants who are experiencing at least moderate levels of severity, as measured by an observer-rated assessment, for each disorder may be more likely to replicate the finding by Carleton et al. and to identify any relationship of the WAS with mental disorders.

The lack of correlation between absenteeism and total WAS scores may potentially be attributed to a combination of factors. The use of a single question on the WPAI:GH as a measure of absenteeism may lack sensitivity. Additionally, first responders are often subjected to strict work leave policies which do not permit unverified absences of more than 1-2 days in the timeframe outlined in question 2 of the WPAI:GH. As such, the measurement of absenteeism as measured by one question of a general questionnaire may not be sufficient in this setting. A multi-dimensional assessment of absenteeism may be necessary for further analysis. Since this study was carried out during the COVID-19 pandemic, patterns of absence may have also been altered due to additional factors such as high-risk contact, infection with COVID-19 or coverage for colleagues off with COVID-19. These confounding factors may also be contributing to the lack of correlation between absenteeism and WAS scores.

The WAS was developed as there is currently no validated scale to characterize the impact of occupational stressors on the mental health of the first responders. Our results suggest that the WAS may be capturing complex feelings of betrayal and humiliation related to their organization and occupation which have not yet been described in current literature. Additional research is needed to further understand these constructs and to ensure that they are accurately captured in the WAS.

#### *4.1 Strengths*

There are multiple strengths of the WAS and of this study. The WAS is the first questionnaire to quantify how occupational stressors collectively translate into more complex feelings of betrayal and humiliation as previous scales primarily focused on quantifying the negative impact of various stressors. While prior studies have only focused on the police, we were able to recruit from paramedic and fire services in addition to police, increasing the generalizability of our findings [9-11]. To date, the WAS is the shortest occupational stressors-related questionnaire with a total of 10 items. This minimizes survey burden for respondents, which has previously been associated with low response rates in self-reports and specifically identified as a limitation of occupational questionnaires [11, 31]. However, caution should be used to ensure that the quality of the content is not sacrificed solely for the purpose of having a brief measure [31]. Additionally, our analysis of concurrent and predictive criterion validity investigated potential correlations between total WAS scores and other psychiatric outcomes, which was a missing component in the validation of other occupational stress scales for the first responder population [11].

#### *4.2 Limitations*

This study also has several limitations. First, is the small sample size. Recruitment for this study took place during the COVID-19 pandemic when first responders were facing high workload, unpredictable duties and procedures, and low morale. These factors certainly contributed to the challenges recruiting a larger, and possibly more diverse, sample. Second, calculations were made with the assumption that data is missing at random, but a small sample size makes it difficult to confirm that this is the case. A small sample size also limited the generalizability of our results and our ability to conduct an exploratory factor analysis. The external validity of our study was further limited as all study participants are Caucasian, which is inconsistent with the current diversity of Ottawa's first responder services. There is also an over-representation of paramedic staff and an under-representation of staff from the Ottawa fire and police services. Lastly, face validity was not measured in this pilot study.

#### 4.3 Future Directions

The results of this pilot study will be used to inform the design of a full validation study of the WAS. Future studies will aim to recruit a larger sample size with greater ethnic diversity and a more equal distribution of first responder occupations. It may also be useful to conduct the full validation with a national population of first responders to ensure that the measure is generalizable across the broader population. With a more representative sample, reliability and validity analyses of the WAS will be repeated with the removal or modification of item 9. Additional analyses may include an assessment of face validity by obtaining participant feedback about the WAS, test-retest reliability, exploratory factor analysis and more extensive correlational analysis by collecting WAS scores at multiple follow-up time points.

#### 5. Conclusions

Our aim for this preliminary study was to assess preliminary validity of a novel instrument, the WAS, as a tool to measure how occupational stressors may provoke feelings of betrayal and humiliation in first responders. Findings from our analysis suggest that the WAS demonstrates strong reliability and convergent validity. There were no significant correlations between WAS and other psychiatric scales. Additional research is needed for further validation of the WAS. Ultimately, we hope that the WAS could be incorporated into routine clinical screening and management for the mental healthcare of first responder patients. We also hope that the use of this scale will encourage first responder staff and leadership to recognize the importance of organizational wellbeing as well as the need and opportunity for impactful change in their organizations.

**Supplementary Materials:** The following supporting information can be downloaded at: [www.mdpi.com/xxx/s1](http://www.mdpi.com/xxx/s1), File S1: Case vignettes; File S2: Workplace Assessment Scale; Table S1: Study outcome measures and timing of administration.

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**Data Availability Statement:** The data presented in this study are available on request from the corresponding author. The data are not publicly available due to ethical restrictions.

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