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Psychological resilience and occupational injuries

Abstract

Resilience embodies the personal qualities that enable one to thrive in the face of adversity. A previous Italian study showed that injured workers had a lower level of resilience than non-injured workers. The aim of this paper is to examine the relationship between occupational injuries and psychological resilience.

The subjects were 197 drivers from two Finnish waste transport companies. As a part of larger questionnaire, they fulfilled the Connor-Davidson Resilience Scale, which consisted of 25 items. Drivers reported their occupational injuries during the last three years.

The drivers involved in occupational injuries had higher score (average 69.3) on Connor-Davidson Resilience Scale than drivers avoided injuries (67.7). According to Student's t-test the difference between groups was highly significant ($t = 40.44$, $df = 196$, $p < 0.001$).

The result of this study was contradictory to earlier Italian study. One explanation may be that the Italian study was done with traumatic context with seriously injured patients. Waste transport drivers were rather young and fit males, who had suffered only minor injuries.

Keywords: work accidents; drivers; waste; Finland

1. Introduction

Resilience is defined in the Oxford dictionary of English as being “able to withstand or recover quickly from different conditions” [1]. The roots of the construct of resilience are both in the psychological aspects of coping and the physiological aspects of stress [2]. Psychological resilience is then conceptualized as “the interactive influence of psychological characteristics within the context of the stress process” [3].

There are several measures of psychological resilience. Perhaps the most often used measure is the Connor-Davidson Resilience scale (CD-RISC), which has 25 items. The scale has a satisfactory internal consistency, test-retest reliability and convergent validity, and has five factors [4]. In addition, the construct validity of the Connor-Davidson Scale has also been confirmed [5]. Burns and Anstey [6] found support for one factor model instead of five factors model for the original scale. Later Campbell-Sills and Stein [7] found a 10-item unidimensional scale better than the original scale, a result which is confirmed among Australian cricketers [8]. Even the scale with two items was found to have good test-retest reliability, convergent validity and divergent validity [9].

The association between psychological resilience and occupational injuries has only been examined in one study. Ghisi and her co-workers [10] showed that injured Italian workers had a lower level of resilience measured by the Connor-Davidson Resilience Scale than non-injured workers. The injured workers were seriously impaired and resilience was associated with other psychological measures (Beck Depression Inventory, State-trait Anxiety Inventory and PTSD Symptom Scale). The aim of this paper is to examine the relationship between psychological resilience and occupational injuries with the data set of health employees.

2. Materials and methods

In Finland, waste transport drivers mostly drive alone. During one work shift, they empty around 100 to 300 waste containers [11]. In addition to mixed waste, biological waste, glass and metal waste, paper and carton waste are separately collected.

The participants were 197 drivers from two Finnish waste transport companies. All of them were males. Most of drivers were middle-aged (26-50 years, 66%), whereas 22% were under 26 years of age and 12% over 50 years of age. All subjects gave their informed consent for inclusion before they participated in this study. This study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Ethics Committee of our institute.

As a part of larger questionnaire, psychological resilience was measured by the Connor-Davidson Resilience Scale (CD-RISC), which consisted of 25 items. The longest version of CD-RISC was selected, because it is the original one and most studied [4]. The instruction said that the CD-RISC is a part of American questionnaire measuring employees' possibilities to survive in challenging situations. The rating was not restricted to the work life. Cronbach's alpha coefficient, measuring the internal consistence of the scale was .90. We used the official Finnish translation made in the University of Jyväskylä. In addition, the participants were asked to report their occupational injuries from the last three years. Forty-nine drivers were involved in injuries, whereas 148 avoided injuries. The definition of occupational injury is based on the drivers' self-reporting.

Means and Student's t-test was used to analyze the difference in resilience score between injury involved and injury-free groups. In the factor analysis of research sample, we used an exploratory principal components analysis with a varimax rotation in order to test the original five factor model.

3. Results

The drivers involved in occupational injuries had a higher CD-RISC score (average 69.3 points) than drivers who avoided injuries (67.7). Although according to Student's t-test the difference between them was highly significant ($t = 40.44$, $df = 196$, $p < 0.001$), the effect size was rather small ($d = 0.37$) and the two points difference is not clinically meaningful. Demographic factors (age and tenure) were not related to occupational injury.

In the factor analysis, the model of five factors was the most suitable for the data. We named the first factor as Facing the challenges. Factor 2 was called Belief in myself. Factor 3 was named Social support in the face of stress. Factor 4 was related to Self-confidence. Factor 5 could be called as Deterministic. The factor pattern for the scale is presented in Table 1. The eigenvalues of five factors were 7.07, 1.11, 0.96, 0.73 and 0.56, respectively.

4. Discussion

The internal consistency of the scale in this study was .90, which is on the same level as that of the original study [4]. Then the Finnish version of the scale is a reliable tool for assessing psychological resilience.

This study showed that drivers involved in injuries had a higher score on the resilience scale than drivers who avoided injuries. This result was contradictory to earlier Italian study [10]. One explanation may be that the participants of the Italian study were seriously injured patients, whereas waste transport drivers in this study were rather young and fit males, who had suffered only minor injuries. Perhaps injury-involved drivers recognized the risks of their job better and they are in this way more resilient than drivers who avoided injuries. Another possible explanation is that resilient drivers can better find new solutions to problematic situations. In these situations, they may violate safety orders and this can result in injuries. Hollnagel [12] assumed from a resilience perspective that variability in the performance of an employee may cause injuries.

Although the five factor solutions fit both the original data [4] and these data, single items were loaded to the different factors. All three items in our fourth factor were from the original second factor. Two out of three items in our third factor were the same as in the original third factor and two out of three items in our fifth factor were the same as in the fifth original factor. Our first and second factors were more a mixture of different original factors. We can conclude that although the factor patterns were the same, our study did not perfectly repeat the original study.

The Connor-Davidson Resilience Scale has been criticized that the five subscales may correlate with each other. The scale may not consist of five distinct subscales [13]. Because the scale was developed by American psychiatrists, some items were rather strange for the Finnish employees. For example, the item 3 "Sometimes fate or God can help" is weird in the secular country like Finland.

The results of this study showed that psychological resilience makes a contribution to the work of waste transport drivers. They encounter unexpected events during their working day and must find out creative solutions to these problems. The situation also applies to many other occupations, which shows the significance of psychological resilience in work life.

Conclusions

This study showed that waste transport drivers involved in occupational injuries had a higher resilience score than drivers who avoided injuries. This result with health workers was against the previous Italian study with seriously injured patients.

Conflicts of interest: None

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Table 1. Varimax-rotation of five factor solution of CD-RISC

Item	Factors (Eigenvalues)				
	1 (7.072)	2 (1.114)	3 (0.956)	4 (0.727)	5 (0.556)
17	0.72829	0.28677	0.01846	0.26116	0.13043
23	0.71038	0.12644	0.08323	0.09933	-0.00469
25	0.61825	0.15815	0.19001	0.08544	0.23276
14	0.60714	0.24568	0.18098	0.19294	0.01010
22	0.59375	0.07148	0.29559	0.03893	0.11948
19	0.57464	0.09628	0.24488	0.36109	-0.03772
16	0.55627	0.38998	0.13065	0.20934	0.14730
24	0.51444	0.34514	0.06881	0.17531	0.05931
21	0.44885	0.03176	-0.05530	0.15138	0.32297
15	0.33667	0.24726	0.11905	0.15871	0.15498
12	0.17531	0.56356	0.25231	-0.08627	0.28831
5	0.24198	0.54488	0.16434	0.15385	0.04797
11	0.30528	0.51138	0.26345	0.02448	0.36049
4	0.12103	0.48353	-0.03153	0.36841	0.08058
6	0.11267	0.45367	0.12467	0.35067	0.10130
1	0.26472	0.44608	0.38465	0.00606	-0.16052
2	0.03249	0.13260	0.57401	0.02857	-0.01094
13	0.25334	0.06548	0.52811	0.14341	0.13688
8	0.18115	0.28288	0.44310	0.13270	0.13180
20	0.18807	0.13001	0.07831	0.51036	0.17101
18	0.20902	0.01287	0.07575	0.45910	0.02987
7	0.17079	0.32930	0.11777	0.43963	0.11071
9	0.09507	0.12024	0.10552	0.10760	0.50259
10	0.35988	0.15652	0.28415	-0.04668	0.44579
3	-0.00795	0.04193	-0.10240	0.26563	0.35220

