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Compassion fatigue among forensic medicine specialists in Türkiye: A cross-sectional study

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Abstract

Compassion fatigue explains the reduced caregiving capacity of healthcare workers as a consequence of repeated exposure to patients' suffering. It is aimed to evaluate compassion fatigue and factors affecting this situation in forensic medicine specialists who evaluate cases that are victims of permanent trauma due to their profession. Data collection forms including demographic data and a short compassion fatigue scale (SCFS) in healthcare workers were filled out online by volunteer forensic experts. 113 forensic experts participated. It was determined that participants' total SCFS score average was 36.86 ± 21.01 , secondary trauma sub-dimension average was 12.39 ± 7.74 , occupational burnout sub-dimension average was 24.47 ± 14.52 . The total mean score of SCFS of the participants who evaluated less sexual assault was statistically significantly higher. The total mean score of SCFS and the mean of occupational burnout sub-dimension of the participants who did autopsy were found to be statistically significantly lower. The occupational burnout sub-dimension average of those who performed autopsy above the monthly autopsy median value was found to be statistically significantly lower. Sub-dimension average of burnout of participants in the first five years of their professional life was found to be statistically significantly higher. It is noteworthy that total and sub-dimension average scores of forensic medicine specialists in Turkey are significantly lower than those of different professions, especially health workers, in different countries. While this may be an indication that occupational depersonalization has developed over the years among forensic medicine specialists in Turkey, especially those who evaluate autopsy and sexual assault cases, from a different perspective, it can be said that increasing professional experience and working in harmony with the education received have a positive effect on compassion fatigue and burnout.

Keywords: Compassion fatigue, occupational burnout, secondary traumatic stress, forensic medicine specialist, short compassion fatigue scale

Introduction

Healthcare professionals are often the ones who enter the lives of patients and their relatives at critical periods, sharing their pain, suffering, helplessness, anxiety and shocking incidents. Aspects like inadequacy in curative interaction, incorporate of situation of patients and relatives, pressure caused by not being able to help, exposure to traumatic situation/situations, inability to spare time for themselves in daily life impose some burdens on health professionals related to treatment and care provision services [1]. Figley cited this burden generically as compassion fatigue and

described the idea thoroughly as a secondary traumatic stress response resulting from helping or desiring to help individuals suffering from traumatic events [2].

Compassion fatigue is defined reduced capacity of a health care worker to provide care outcome of sustained exposure to patients' ache. Compassion fatigue is a consequence of maintaining medical attention and is frequently contemplated the consequence of numerous events, although it can result from the participation in caring for a single patient or event. Compassion fatigue is interrelated to the conceptions of "vicarious trauma"

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with “secondary traumatic stress”, the two of them which arise from exposure to the trauma experienced by patients rather than the trauma itself. Nevertheless, there are other factors that contribute to the development of compassion fatigue, such as burnout, which can affect a person’s capacity to care by developing through factors like long working time, duty cycle and the job atmosphere [3-5].

The negative results of working with trauma are widely recognized. Most research has focused on professionals working with high-risk cases or situations, such as firefighters, ambulance personnel, substance abuse counselors, social workers, police officers and nurses. Among the negative effects most commonly found in trauma professionals are secondary traumatic stress, vicarious traumatization, compassion fatigue and burnout [6].

Within the last decade, interest in the influence of exposure to trauma survivors on forensic scientists has increased [7]. A number of challenges for forensic scientists were identified, including ambiguous standards and research essentials, extensive backlogs, incompatible certification and accreditation systems [8]. Additional observations by forensic scientists themselves identified stressors including exposure to traumatic scenes, evidence and other case materials, expectations of faultlessness (or “zero tolerance” for mistakes), working in a competitive legal system [9].

Empirical research entailing questionnaires from small groups of forensic scientists has shown that Romanian forensic pathologists have depression, poor sleep and changes in life opinion, child homicide investigators have significantly increased psychological symptoms, Korean forensic scientists have a correspondence between post-traumatic symptoms and homicide experience, fatigue and years in the field [7,10-12].

This study is aimed to evaluate compassion fatigue and the factors influencing it in forensic medicine specialists who constantly evaluate trauma victims due to their profession.

Material and Methods

Using the G-power power analysis application, the required number of samples was determined as 111 according to the independent samples t test analysis with 95% confidence ($1-\alpha$), 95% test power ($1-\beta$) and $d=0.5$ effect size. Data collection forms including demographic data and short compassion fatigue scale in healthcare workers were completed online by volunteer forensic medicine specialists.

The Short Compassion Fatigue Scale is a scale consisting of a total of 13 questions with two subgroups evaluating occupational burnout and secondary traumatic stress. This scale was developed by Adams et al. They prepared scale in a 10-point Likert type (1=Never and 10=Too Much) [13]. The highest 130 and the lowest 13 points can be collected from the scale. The higher the score interprets the higher the level of compassion fatigue. Cronbach’s alpha internal consistency coefficient for whole scale was calculated as 0.91. The Turkish version of the short compassion fatigue scale is a valid and reliable measurement tool for determination of compassion fatigue in medical professions

[1].

Descriptive statistics of the data are given in the study. The normality assumption was checked with the Shapiro Wilk test as the first step of the statistical analysis. The Mann Whitney U test was applied to examine difference between the averages of two independent groups where the assumption of normality was not met. The Kruskal Wallis test was applied to examine the difference between the means of three or more independent groups where the assumption of normality was not met. Post Hoc Bonferroni test was used to reveal the group or groups that created the difference. Spearman correlation was applied to measure relationship between continuous variables that were not suitable for normal distribution. Analyses were performed in SPSS 25 (IBM Corp., Armonk, NY, USA).

This study was carried out in accordance with the Declaration of Helsinki. Approval for the study was obtained from Manisa Celal Bayar University Faculty of Medicine Health Sciences Ethics Committee.

Results

A total of 113 volunteer forensic medicine specialists participated in the study. The cities where the participants worked included all regions of Türkiye. Descriptive statistics of the demographic characteristics and monthly average number of cases of forensic medicine specialists taking part in the research are given in Table 1.

Reliability analyses were applied to test the consistency of the Short Compassion Fatigue scale and sub-dimensions applied according to the answers given by the participants in the study. Secondary Trauma sub-dimension is highly reliable with a Cronbach’s alpha reliability coefficient of 0.842. The Occupational Burnout sub-dimension is very highly reliable with a Cronbach’s alpha reliability coefficient of 0.902. Compassion Fatigue scale was found to be very highly reliable with a Cronbach’s alpha reliability coefficient of 0.926 (Table 2).

The mean total score of Compassion Fatigue scale was 36.86 ± 21.02 . The mean total score of the Occupational Burnout sub-dimension was 24.47 ± 14.52 . Secondary Trauma subscale total mean score was 12.39 ± 7.74 .

Assumptions were checked and Mann Whitney U and Kruskal Wallis tests were used to compare the mean total scores of the Occupational Burnout subscale according to the clinical and demographic features of participants (Table 3). As a result of the analyses, a statistically significant difference was found between the mean scores of the subscale total scores according to the duration of employment ($p < 0.05$). Statistically significant differences were shown between people working “<5 years” and people working “5-9 years” and “10-14 years” ($p=0.016$ and $p=0.019$). The mean total score of people working less than 5 years is higher than the mean total scores of people working 5-9 years and 10-14 years.

A statistically significant difference was established between the mean total scores of sub-dimensions in accordance with the status of performing autopsy/death examination ($p < 0.05$).

Table 1. Demographic features of the participants and distribution of the monthly average number of cases

		n	%					
Gender	Male	80	70.8					
	Female	33	29.2					
Marital status	Married	78	69.0					
	Single/divorced	35	31.0					
Instution	Council of forensic medicine	65	57.5					
	University	23	20.4					
	Ministry of health	25	22.1					
Working year	<5 years	53	46.9					
	5-9 years	32	28.3					
	10-14 years	12	10.6					
	>14 years	16	14.2					
Do you evaluate forensic cases other than autopsy or sexual assault cases?	No	10	8.8					
	Yes	103	91.2					
Do you evaluate cases of sexual assault/abuse?	No	28	24.8					
	Yes	85	75.2					
Do you do autopsy/dead examination?	No	51	45.1					
	Yes	62	54.9					
Monthly forensic cases excluding autopsy or sexual assault cases	1-100	46	44.7					
	101-200	24	23.3					
	201-300	15	14.6					
	300-600	14	13.6					
	601-6000	4	3.9					
Number of sexual assault/abuse cases per month	1-10	66	77.6					
	11-50	16	18.8					
	>50	3	3.5					
Number of autopsies/dead examinations per month	1-30	46	74.2					
	31-90	12	19.4					
	>90	4	6.5					
Monthly forensic cases excluding autopsy or sexual assault cases	Below the median	57	50.4					
	Above the median	56	49.6					
Number of sexual assault/abuse cases per month	Below the median	66	58.4					
	Above the median	47	41.6					
Number of autopsies/dead examinations per month	Below the median	57	50.4					
	Above the median	56	49.6					
	n	Min.	Max.	Mean	Standart deviaton	Median	25% quarterly	75% quarterly
Age	113	29	65	38.41	7.81	35	33	45
Number of forensic cases	113	0	6000	246.04	602.17	110	55	250
Number of evaluation of sexual assault/abuse cases	113	0	250	12.47	36.90	5	1	10
Number of autopsies/dead examinations	113	0	300	15.86	35.53	3	0	20

Table 2. Reliability analyzes of compassion fatigue scale and its sub-dimensions

Scales and sub-dimensions	Number of items	Cronbach alfa
Occupational burnout sub-dimension	8	0.902
Secondary trauma sub-dimension	5	0.842
Brief compassion fatigue scale	13	0.926

Table 3. Comparison of the Occupational Burnout sub-dimension total score averages according to the demographic and clinical characteristics of the participants

		n	Mean	Standart deviation	Rank average	Test statistics	p
Gender	Male	80	22.44	12.60	53.86	1068.5	0.112
	Female	33	29.39	17.62	64.62		
Marital status	Married	78	23.01	13.68	53.81	1116.5	0.122
	Single/divorced	35	27.71	15.96	64.10		
Instution	Council of forensic medicine	65	23.85	14.35	55.42	1.584	0.453
	University	23	23.26	15.05	53.67		
	Ministry of health	25	27.20	14.72	64.16		
Working year	<5 years	53	27.43	14.42	65.22	9.202	0.027*
	5-9 years	32	20.41	12.00	47.63		
	10-14 years	12	19.25	15.76	40.58		
	>14 years	16	26.69	16.70	60.84		
Do you evaluate forensic cases other than autopsy or sexual assault cases?	No	10	25.00	13.18	60.40	481.0	0.731
	Yes	103	24.42	14.70	56.67		
Do you evaluate cases of sexual assault/abuse?	No	28	24.57	15.68	55.82	1157.0	0.826
	Yes	85	24.44	14.21	57.39		
Do you do autopsy/dead examination?	No	51	27.96	15.45	65.15	1165.5	0.016*
	Yes	62	21.60	13.14	50.30		
Monthly forensic cases excluding autopsy or sexual assault cases	1-100	46	23.87	14.06	51.63	0.315	0.989
	101-200	24	24.79	14.63	53.81		
	201-300	15	27.27	19.26	52.50		
	300-600	14	24.00	14.07	51.54		
	601-6000	4	19.25	8.14	45.13		
Number of sexual assault/abuse cases per month	1-10	66	26.00	15.04	45.48	2.984	0.225
	11-50	16	19.19	10.05	34.22		
	>50	3	18.00	3.61	35.33		
Number of autopsies/dead examinations per month	1-30	46	22.72	13.98	32.68	0.791	0.673
	31-90	12	19.08	11.33	28.46		
	>90	4	16.25	5.19	27.00		
Monthly forensic cases excluding autopsy or sexual assault cases	Below the median	57	24.65	14.35	57.95	1542.0	0.756
	Above the median	56	24.29	14.81	56.04		
Number of sexual assault/abuse cases per month	Below the median	66	25.94	14.78	60.98	1288.5	0.126
	Above the median	47	22.40	14.03	51.41		
Number of autopsies/dead examinations per month	Below the median	57	27.51	14.95	64.76	1153.5	0.011*
	Above the median	56	21.38	13.49	49.10		

*p<0.05

The mean total score of the people who did not perform the examination was higher than the mean total score of the people who performed the examination.

A statistically significant difference was found between the mean total scores of the sub-dimension according to the median value of the status of performing autopsy/death examination ($p<0.05$). The mean total score of those who performed more than three examinations is higher than the mean total score of those who performed less than three examinations.

The assumptions were checked and Mann Whitney U and Kruskal Wallis tests were applied to compare the mean total scores of the Compassion Fatigue scale according to the demographic and clinical features of the individuals and are shown in Table 4. A statistically significant difference was found between the mean total scores of the scale according to the status of performing autopsy/death examination ($p<0.05$). The mean total score of the people who did not perform an examination was higher than the mean total score of the people who performed an examination.

Table 4. Comparison of the total mean scores of the compassion fatigue scale according to the clinical and demographic features of the participants

		n	Mean	Standart deviation	Rank average	Test statistics	p
Gender	Male	80	33.75	18.13	53.46	1036.5	0.073
	Female	33	44.39	25.52	65.59		
Marital status	Married	78	35.09	20.12	54.03	1133.5	0.150
	Single/divorced	35	40.80	22.69	63.61		
Instution	Council of forensic medicine	65	34.94	19.53	54.48	1.877	0.391
	University	23	36.57	23.54	55.54		
	Ministry of health	25	42.12	22.30	64.88		
Working year	<5 years	53	40.83	21.41	64.25	7.539	0.057
	5-9 years	32	31.19	16.46	48.72		
	10-14 years	12	31.67	25.94	41.63		
	>14 years	16	38.94	22.48	61.09		
Do you evaluate forensic cases other than autopsy or sexual assault cases?	No	10	39.30	20.42	64.50	440.0	0.448
	Yes	103	36.62	21.15	56.27		
Do you evaluate cases of sexual assault/abuse?	No	28	36.64	22.05	56.27	1169.5	0.891
	Yes	85	36.93	20.80	57.24		
Do you do autopsy/dead examination?	No	51	41.88	22.88	64.62	1192.5	0.025*
	Yes	62	32.73	18.53	50.73		
Monthly forensic cases excluding autopsy or sexual assault cases	1-100	46	35.52	19.70	51.53	0.639	0.959
	101-200	24	37.67	20.19	55.13		
	201-300	15	41.53	29.52	52.03		
	300-600	14	35.50	20.41	50.61		
	601-6000	4	28.50	12.40	43.38		
Number of sexual assault/abuse cases per month	1-10	66	39.24	21.99	45.41	2.865	0.239
	11-50	16	29.06	14.69	34.09		
	>50	3	28.00	6.24	37.50		
Number of autopsies/dead examinations per month	1-30	46	34.50	19.90	32.91	1.131	0.568
	31-90	12	28.75	15.06	27.92		
	>90	4	24.25	2.50	26.00		
Monthly forensic cases excluding autopsy or sexual assault cases	Below the median	57	36.88	20.19	58.18	1528.5	0.698
	Above the median	56	36.84	22.01	55.79		
Number of sexual assault/abuse cases per month	Below the median	66	39.12	21.51	61.23	1271.5	0.103
	Above the median	47	33.68	20.10	51.05		
Number of autopsies/dead examinations per month	Below the median	57	41.23	22.16	64.34	1177.5	0.016*
	Above the median	56	32.41	18.96	49.53		

*p<0.05

A statistically significant difference was found between the mean total scores according to the median value and the status of performing autopsy/death examination. The mean total score of those who performed less than three examinations was higher than the mean total score of those who performed more than three examinations.

Assumptions were checked and Spearman correlations were applied to inspect the relationships between the clinical and demographic features of the participants and the total scores of the Compassion Fatigue scale and its sub-dimensions (Table 5). A statistically significant, negative and weak relationship was found between the number of autopsies/dead examinations and the total scores of the Occupational Burnout subscale

with a regression coefficient of -0.290 ($p<0.05$). A statistically significant, negative and weak relationship was seen between the number of autopsies/death examinations and the total scores of the Second Trauma subscale with a regression coefficient of -0.210. A statistically significant, negative and weak relationship was found between the number of autopsies/death examinations and the total scores of the Compassion Fatigue scale with a regression coefficient of -0.279.

There was not statistically significant relationships between age, number of forensic cases and number of sexual assault/abuse case evaluations and total scores of the scale and its sub-dimensions ($p>0.05$).

Table 5. The relationships between the demographic and clinical features of the participants and the total scores of the compassion fatigue scale and its sub-dimensions

		Occupational burnout	Secondary trauma	Compassion fatigue scale
Age	Rho	-0.111	-0.003	-0.073
	p	0.241	0.978	0.440
Number of forensic cases excluding autopsy or sexual assault cases	Rho	-0.023	-0.043	-0.050
	p	0.806	0.654	0.600
Number of Evaluation of Sexual Assault/Abuse Cases	Rho	-0.108	-0.051	-0.104
	p	0.257	0.588	0.273
Number of Autopsies/Dead Examinations	Rho	-0.290*	-0.210*	-0.279*
	p	0.002	0.026	0.003
*p<0.05				

Discussion

The mean total score of the short compassion fatigue scale was 36.86±21.01, the mean score of the secondary trauma sub-dimension was 12.39±7.74 and the mean score of the professional burnout subscale was 24.47±14.52. There are no other studies in the literature in which only forensic medicine specialists were evaluated with the short compassion scale. In Türkiye, it was reported that the mean total score was between 66-80, the mean secondary trauma sub-dimension score was between 23-32 and the mean occupational burnout sub-dimension score was between 42-48 in the evaluations made with the Short Compassion Scale with gynecologists and obstetricians, physicians working in emergency services and nurses working in COVID-19 services [14-16]. In studies conducted with the Short Compassion Scale with nurses and journalists in USA, veterinarians in Australia, health workers and fireman in China, it was announced that the mean total score was 40-48, the mean secondary trauma subscale score was 14-17 and the mean occupational burnout subscale score was 28-34 [17-20]. It is noteworthy that the overall and subscale mean scores of forensic medicine specialists in Türkiye are significantly lower than those of other professionals, especially health professionals, in different countries. A study of forensic scientists showed that those working in the field recorded higher levels of secondary traumatic stress than those working in laboratory, but burnout and satisfaction with compassion were not significantly different between these groups [7]. Compassion fatigue is activated by constant use of empathy and emotional energy, previous exposure to trauma, prolonged exposure to secondary trauma (result of witnessing trauma of others rather than being the primary subject of the trauma and having to care for those who suffer) [21]. When psychiatric nurses were evaluated, it was reported that nurses working in general psychiatry services showed higher levels of burnout than forensic psychiatry nurses, and similarly, forensic nurses had higher levels of job satisfaction than other nurses. It was stated that these findings contradict the common misconception that working in forensic medicine is a more stressful area of practice involving care of more dangerous and unpredictable patients [22].

In studies conducted with forensic nurses evaluating sexual assault, it was seen that most of the participants had moderate

levels of compassion fatigue, moderate to high levels of secondary traumatic stress and burnout [23,24]. It is noted that when health care providers help others through sexual assault examinations or traumatic events, this can lead to high compassion fatigue [25]. In our research, the mean total score of the short compassion fatigue scale was seen to be statistically significantly higher in participants who rated sexual assault/abuse below the monthly median value.

Twenty-five articles investigating common occupational safety risks and health-related conditions of forensic autopsy professionals identified two main risk groups: mental/emotional stressors such as posttraumatic stress disorder, depression, burnout, fatigue and anxiety, and infectious diseases [26]. In studies evaluating those working with forensic death cases, it has been generally reported that direct or indirect exposure to traumatic death cases has negative mental health consequences [27,28]. However, a study conducted in Romania with autopsy technicians showed that the burnout levels of the participants were low [29]. In addition, a study conducted in the USA reported that secondary trauma symptoms resulting from routine exposure to traumatic deaths were not detected in workers performing forensic death assessment [30]. In our study, the mean total score of the short compassion fatigue scale and the mean occupational burnout sub-dimension were found to be statistically significantly lower in participants who performed autopsies compared to those who never performed autopsies. In addition, the mean of the occupational burnout sub-dimension of those who performed autopsies above the monthly autopsy median value was statistically significantly lower than those who performed fewer autopsies.

There is a link between job satisfaction and some other facts, such as burnout, role conflict, and the appearance of psychological and social symptoms in members of staff. The lack of job satisfaction is strongly associated with burnout and compassion fatigue. It is known that the appropriate level of education can be an important protective factor against some negative work-related experiences [31]. From this point of view, it can be thought that it is important for forensic medicine specialists participating in autopsy and sexual assault examinations to provide services compatible with their education and profession in detecting less burnout.

Secondary traumatic stress is more likely to be caused by an intermittent traumatic event, like mass disaster, while vicarious trauma is exhibited by prolonged and accumulative exposure to traumatic material [32]. In a research on the long-term effects of mental health in forensic workers, differences were found in alienation (feeling distant or different from others) as a forecaster of depression [27]. It has been reported that burnout is more common in employees who are in the early stages of their careers. And those who burn out early in their careers are likely to quit their jobs, leaving behind the survivors who consequently exhibit lower levels of burnout [33]. In our study, the mean of the burnout sub-dimension of the participants who were in the first five years of their professional life was found to be statistically significantly higher than forensic medicine specialists who had been working for a longer period of time. In terms of compassion fatigue and secondary trauma, there was no effect of working time in the profession. It was thought that as they gained experience in the profession, they produced solutions to cope with burnout.

The brief compassion fatigue scale assesses two components of compassion fatigue, namely occupational burnout and secondary trauma symptoms, and does not assign any level such as low, medium or high according to the score. Participants were not asked about other psychiatric disease and symptoms (anxiety, depression...). In future studies, the compassion fatigue of the groups can be compared in this context. Moreover, online data collection has some risks such as representative sampling, response rates and generalizability of findings, so online data collection is another limitation of the current study.

Conclusion

In conclusion, it was surprising that forensic medicine specialists who serve as medicine specialists in a wide range of subjects such as non-fatal forensic case evaluation, crime scene investigation, autopsy practice, medico-legal evaluation of sexual assault cases, occupational accidents, document examination, etc. had low levels of compassion fatigue and related professional burnout and secondary trauma. This may be an indication that forensic medicine specialists in Türkiye, especially those who evaluate autopsy and sexual assault cases, have developed professional desensitization over the years. In addition, when the findings are viewed from a different perspective, it can be said that increasing professional experience and working in harmony with the education received have a positive effect on compassion fatigue and burnout. Given the findings of this study, further research is needed to gain a deeper understanding of why forensic medical examiners in Türkiye appear to be more positive and supportive than other health professionals and forensic science professionals in other countries.

Conflict of Interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical Approval

Study approval was obtained from Manisa Celal Bayar University Faculty of Medicine Health Sciences Ethics Committee, dated 12.10.2022 and numbered 1544.

References

1. Yıldırım S, Cavcav F. The compassion fatigue-short scale for healthcare professionals: a Turkish study of validity and reliability. *Perspect Psychiatr Care*. 2021;57:1459-65.
2. Figley CR. Compassion fatigue: psychotherapists' chronic lack of self care. *J Clin Psychol*. 2002;58:1433-41.
3. Nimmo A, Huggard P. A systematic review of the measurement of compassion fatigue, vicarious trauma, and secondary traumatic stress in physicians. *Australasian Journal of Disaster and Trauma Studies*. Volume 2013;1:37-44.
4. Cavanagh N, Cockett G, Heinrich C, et al. Compassion fatigue in healthcare providers: a systematic review and meta-analysis. *Nurs Ethics*. 2019;27:639-65.
5. Rossi A, Cetrano G, Pertile R, et al. Burnout, compassion fatigue, and compassion satisfaction among staff in community-based mental health services. *Psychiatry Res*. 2012;200:933-8. Erratum in: *Psychiatry Res*. 2013;205:183.
6. Crivatu IM, Horvath MAH, Massey K. The impacts of working with victims of sexual violence: a rapid evidence assessment. *ABUSE* 2023;24:56-71.
7. Levin AP, Putney H, Crimmins D, McGrath JG. Secondary traumatic stress, burnout, compassion satisfaction, and perceived organizational trauma readiness in forensic science professionals. *J Forensic Sci*. 2021;66:1758-69.
8. Committee on identifying the needs of the Forensic Sciences Community National Research Council: Strengthening Forensic Science in the United States: a path forward. 2009. <http://www.nap.edu/catalog/12589.html> access date 21.04.2023
9. Slack DP. Trauma and coping mechanisms exhibited by forensic science practitioners: a literature review. *Forensic Sci Int Synerg*. 2020;2:310-6.
10. Adderley R, Smith LL, Bond JW, Smith M. Physiological measurement of crime scene investigator stress. *International Journal of Police Science & Management*. 2012;14:166-76.
11. Yoo YS, Cho OH, Cha KS, Boo YJ. Factors influencing post-traumatic stress in Korean forensic science investigators. *Asian Nurs Res (Korean Soc Nurs Sci)*. 2013;7:136-41.
12. Iorga M, Soponaru C, Ioan BG. The burnout syndrome of forensic pathologists. The influences of personality traits, job satisfaction and environmental factors. *Rom J Leg Med*. 2016;24:325-32.
13. Adams RE, Boscarino JA, Figley CR. Compassion fatigue and psychological distress among social workers: a validation study. *Am J Orthopsychiatry*. 2006;76:103-8.
14. Dirik D, Sak R, Şahin-Sak İT. Compassion fatigue among obstetricians and gynecologists. *Curr Psychol*. 2021;40:4247-54.
15. Ustun G, Dogan N. Emotional labor behavior and compassion fatigue in nurses caring for individuals with COVID-19: a descriptive cross-sectional study. *Int J Caring Sci*. 2022;15:1640-8.
16. Sahan S, Öztürk A, Çınar D, İsmailoğlu EG. Investigating the compassion fatigue in emergency department physicians and nurses. *Prog Health Sci*. 2022;12:101-9.

17. Urban SJ. Nurses' reflection, compassion fatigue, and work burnout-a correlational analysis. Doctoral Dissertation, Walden University, Minneapolis, 2017.
18. Dworznik G. Personal and organizational predictors of compassion fatigue symptoms in local television journalists. *Journalism Practice*. 2017;12:640-56.
19. Dow MQ, Chur-Hansen A, Hamood W, et al. Impact of dealing with bereaved clients on the psychological wellbeing of veterinarians. *Aust Vet J*. 2019;97:382-9.
20. Sun B, Hu M, Yu S, et al. Validation of the compassion fatigue short scale among Chinese medical workers and firefighters: a cross-sectional study. *BMJ Open*. 2016;6:e011279.
21. Circenis K, Millere I. Compassion fatigue, burnout and contributory factors among nurses in Latvia. *Procedia Soc Behav Sci*. 2011;30:2042-6.
22. Happell B, Martin T, Pinikahana J. Burnout and job satisfaction: A comparative study of psychiatric nurses from forensic and a mainstream mental health service. *Int J Ment Health Nurs*. 2003;12:39-47.
23. Flarity K, Nash K, Jones W, Steinbruner D. Intervening to improve compassion fatigue resiliency in forensic nurses. *Adv Emerg Nurs J*. 2016;38:147-56.
24. Yang YH, Kim JK. A Literature review of compassion fatigue in nursing. *Korean Journal of Adult Nursing*. 2012;24:38-51.
25. Hite A, Overstreet W, Giefer C, Belcher G. Innovative assessments for retention of sexual assault nurse examiners. *J Forensic Nurs*. 2022;18:185-8.
26. Drake SA, Thoene C, Foster M, et al. Medicolegal death investigator workplace safety hazards: A scoping review of the literature. *J Forensic Sci*. 2022;67:44-55.
27. Brondolo E, Eftekharzadeh P, Clifton C, et al. Work-related trauma, alienation, and posttraumatic and depressive symptoms in medical examiner employees. *Psychol Trauma*. 2018;10:689-97.
28. Coleman JA, Delahanty DL, Schwartz J, et al. The moderating impact of interacting with distressed families of decedents on trauma exposure in medical examiner personnel. *Psychol Trauma*. 2016;8:668-75.
29. Iorga M, Muraru I-D, Hanganu B, et al. Burnout, alexithymia and job satisfaction in autopsy technicians. *Rom J Leg Med*. 2020; 28:339-47.
30. Ritter TW. The aftermath: is post-traumatic stress disorder prevalent in medico-legal death investigators in the mid-Atlantic states? Doctoral Dissertation, Capella University, Minneapolis, 2013.
31. Piko BF. Burnout, role conflict, job satisfaction and psychosocial health among Hungarian health care staff: a questionnaire survey. *Int J Nurs Stud*. 2006;43:311-8.
32. Baird K, Kracen AC. Vicarious traumatization and secondary traumatic stress: A research synthesis. *Couns Psychol Q*. 2006;19:181-8.
33. Maslach C, Schaufeli WB, Leiter MP. Job Burnout. *Annual Review of Psychology*. 2001;52:397-422.