

Supplementary materials

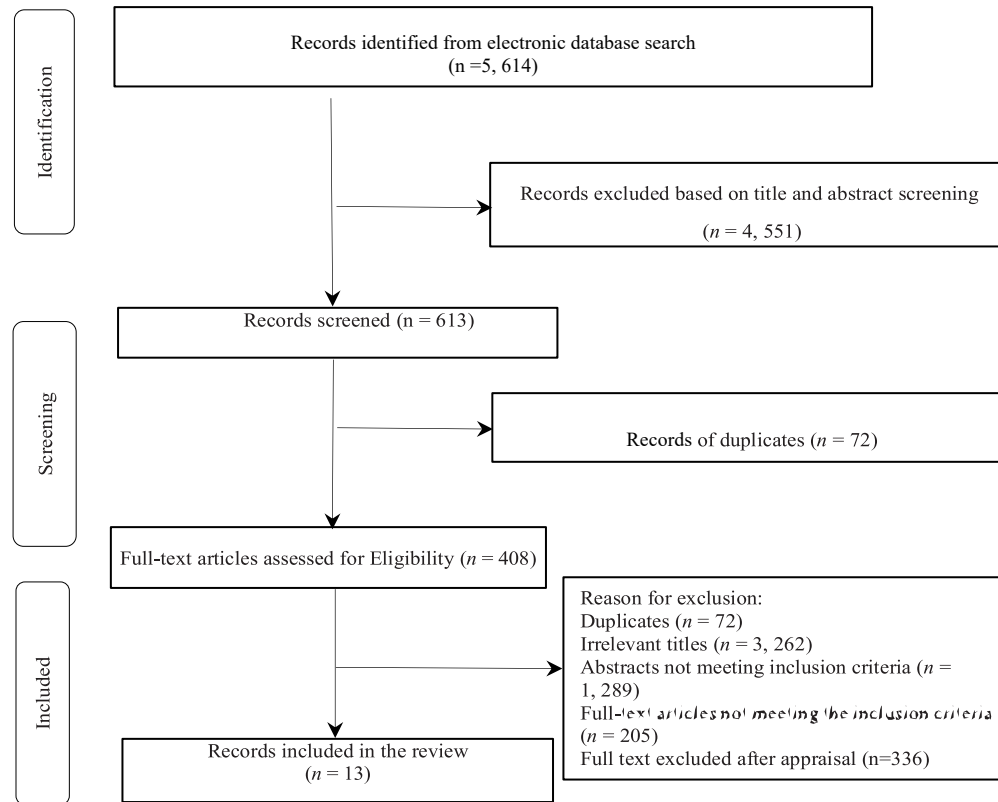


Figure 1. PRISMA Flowchart

Table 1: Characteristics of the Included Studies

Author (Year) Journal	Title	Objective(s)	Methodology	Major findings	Limitations
Renkiewicz et al. (2021) <i>Prehospital Emergency Care</i> (2021) 26(5):652- 663	Secondary Traumatic Stress in Emergency Services Systems (STRESS) Project: Quantifying and Predicting Compassio n Fatigue in Emergency Medical Services Personnel	Identify the prevalence and predictors of CF in EMS professionals.	It is a cross-sectional study involving sampling of EMS workers with one- stage area sampling approach. In this regard, nine EMS agencies from different geographical regions offered information concerning the service areas and types of calls. Participants were interviewed through in-person surveys conducted each	In total, 686 EMS workers responded to the survey. Overall, 48% reported having CF, wherein 50.8% were men and 14% were minorities. It was found that EMS workers were 48% more likely to suffer from CF if they knew any EMS provider who committed suicide ($p = 0.047$). Moreover, those	Further research should be conducted to examine causes and mitigation strategies, along with the effect of CF on individuals and agencies within the pre- hospital setting.

			month during their training. The survey assessed the association between CF and psychosocial factors through ProQOL. Parametric and non-parametric tests were used where appropriate for the univariate analysis.	suffering from traumatic stress syndromes concurrently, like vicarious trauma and burnout, were 4.61 and 3.35 times more likely to suffer from CF, respectively.	
Crampton (2014) <i>Health Research Premium Collection; ProQuest Dissertations & Theses Global</i>	Comparison of PTSD and Compassion Fatigue Between Urban and Rural Paramedics	Develop a deeper understanding of the effects of job stressors more specifically critical incidents on a paramedic's wellbeing,	Based on the findings of this study, there was no statistically significant difference between rural and urban paramedics suffering from either PTSD (4% urban and 0% rural)	There were two inventories that were administered; these are Detailed Assessment of Post-traumatic Stress (DAPS) and Professional Quality of Life Scale (ProQOL). The Detailed Assessment of Post-	There were several paramedics who viewed themselves as being affected by the weakness and at risk of being dismissed by management knowing that the paramedics could not deal with the situation

(2014) 135062702 6		which is critical in developing sound intervention plans.	or CF (46% urban and 32% rural). The findings revealed that 43% of urban paramedics were suffering from BO compared to 29% of rural paramedics. On the other hand, 32% of rural paramedics were suffering from CS compared to 21% urban paramedics. Sixty-seven percent of all paramedics reported STS. This study implies that, even though there is no significant difference between rural and urban paramedics in relation to PTSD and CF, there were sufficient findings indicating	Traumatic Stress Inventory comprises of 105 items that give detailed description of an individual's reactions towards traumatic experience. It has been standardized on a sample of 433 adults from the general population, 215 validity samples (145 clinical, 70 non-clinical) and 290 university students. Professional Quality of Life Scale comprises of 30 Likert-like items that the participant has to fill in for the experiences that happened within the past 30 days from never to very often. This inventory	efficiently. The number of DAPS that had been excluded from the analysis due to Positive Bias (PB) scores showed that the paramedics tried to answer the questions in such a manner that made them look better than they actually did. The reluctance of participants to acknowledge their problems may have influenced the lower rates of PTSD and CF. This study did not examine the marital status of paramedics, even though there is higher divorce rate among paramedics than the rest of the
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			distress among paramedics.	contains three subscales namely; Compassion Satisfaction (CS), Burnout (BO) and Secondary Traumatic Stress (STS). In this case, BO and STS were averaged together to measure the level of CF. The data was then collected and analyzed. Participants were classified based on EMS level (paramedic, EMT-B), affiliation (rural, urban) and DAPS/ProQOL scores. Every DAPS and ProQOL scores were calculated to determine which paramedic exhibited PTSD and/or CF.	population. Another weakness of this research is the low sample size, especially for rural paramedics.
Metcalf et al. (2022)	Compassion, stigma,	Explore the experiences	Thirty-six emergency	There were several classes of themes	The results of the current study are

<i>JACEP Open</i> (2022) Volume 3, Issue 1, e12641	and professional ism among emergency personnel responding to the opioid crisis: An exploratory study in New Hampshire, USA	and perspectives of emergency personnel responding to the opioid crisis in NH, with a focus on their views toward people who use opioids.	professionals including clinicians (n = 18), emergency service providers (n = 6), fire-fighters (n = 6), and police officers (n = 6) from six counties in New Hampshire took part in semi-structured interviews regarding their overdose experiences as well as their perceptions of opioid users. Directed content analysis was employed in order to examine the themes arising from these interviews.	found among the experiences and views of the emergency personnel about their overdose response activities. Some of those themes include different levels of compassion and stigma towards individuals using opioids; connections between compassion/stigma and policy/practice themes like pre- hospital emergency care and EDs; and lastly, professional responsibility overriding personal biases of those who expressed compassion.	exploratory and cross-sectional and should only be used for developing hypotheses, not conclusions. Study includes a fairly small sample of non-probability type of emergency responders from 1 rural state in the United States. The results of the current study may not be generalizable to other regions within the country, especially urban and racially/ethnically diverse regions. The analysts were aware of the profession of the participant during the coding process
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					and subsequent analysis. The threshold of 75% for these associations was arbitrary but fairly high.
Won et al. (2023) <i>Journal of Health Research</i> (2023) 37(4):270-279	A Qualitative Analysis of Emergency Medical Services (EMS) Personnel Experiences and Perceptions Responding to Drug Overdoses in the United States (US) During the COVID-19 Pandemic.	Describe the experiences of EMS personnel in responding to drug overdose-related calls and the impact the pandemic has had to help better inform current response and treatment efforts.	The study used semi-structured interviews for data collection, with 99 EMS professionals interviewed in 18 sentinel sites across the U.S., which are identified by the National Drug Early Warning System (NDEWS) based at the National Institute on Drug Abuse (NIDA). Interviewees were probed on issues such as possible burden related to both the pandemic and the opioid epidemic. Coding of	The responses were classified under the following categories or themes: 1) being over-worked due to the rise in call volume; 2) increased risk for personal harm when responding to patients; 3) compassion fatigue as a result of working overtime and repeated calls to the same people; 4) conflicting perception about the usefulness of naloxone; and 5) need for proper intervention due to	In spite of the fact that the study was conducted as a multi-center study across the entire United States, it might be possible that the sample selected was not representative of all EMS personnel in the US. This is considering that all EMS personnel have been overworked since the outbreak of the pandemic. In light of this, it is not known whether this impacted participation in the

			interview transcripts and identification of themes using qualitative content analysis were done. Descriptive, recoding, subcoding, pattern-coding, and thematic coding of interview transcripts were performed.	opioids and COVID-19.	study and their responses. While some EMS personnel might have been uncomfortable reporting some information, others could just be using the study for reporting work-related stress.
Parker et al. (2024) <i>International Journal of Paramedicine</i> (2024) 6, 62–82	The Relationship Between Emotional Intelligence, Self-Compassion and Wellbeing in Ambulance Staff	Explores the relationship between emotional intelligence and self-compassion, two factors related to positive well-being in other populations, and the professional quality of life and	A within participants cross-sectional survey design was carried out among UK ambulance workers. Data were gathered through an anonymous online survey about their demographic characteristics, emotional intelligence, self-compassion (divided into sub-factors of self-coldness and self-kindness),	A total of 146 ambulance personnel responded to the survey. Negative correlations were found between emotional intelligence, self-kindness and compassion fatigue, whereas positive correlations were found between self-coldness and compassion fatigue, emotional	First, the limitations concerning the sample. Collection of the data happened in times of a pandemic, which could potentially affect the staff members' wellbeing negatively because of additional stressors. Another limitation is that the data were collected

		psychological well-being of ambulance staff.	compassion fatigue, compassion satisfaction, and psychological well-being. Firstly, the correlations among variables were investigated by means of Pearson's r correlation analysis. Secondly, three multiple regressions were performed to examine the predictors of the three outcome measures which were compassion fatigue, compassion satisfaction, and psychological well-being.	intelligence, self-kindness and compassion satisfaction and psychological wellbeing; meanwhile negative correlations were found between self-coldness and compassion satisfaction and psychological wellbeing. Hierarchical Multiple Regression showed that compassion fatigue was significantly predicted by high self-coldness and experience, compassion satisfaction was predicted by high emotional intelligence and low	anonymously and self-reported. In addition, as it was a cross-sectional research, no causation can be established. Lastly, the number of variables used was limited.
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				experience, and psychological wellbeing was predicted by high emotional intelligence and low self-coldness.	
Van Puyvelde et al. (2024) <i>Frontiers Public Health</i> (2023) 11:1136090	Walk the line: a systemic perspective on stress experienced by emergency medical personnel and by comparing military and civilian prehospital settings	Compare both contexts to understand the type of stress events personnel experience; whether experience differs between personnel; and how they cope with it.	A mixed method was adopted where the results obtained from the quantitative questionnaire were combined with the findings from the thematic analysis of 23 people out of 58 contacted who agreed to take part in the semi-structured interviews to gain additional qualitative information.	Ambivalence in terms of perception of emotions and stress, vulnerability of imbalance between having too much passion towards work at the expense of sacrificing one's own life (in view of increasing risks and dangers associated with work environment) and lack of appreciation both on the part of the patient and organizational environment.	The research has certain limitations due to the fact that it was conducted using a comparative approach and is based only on the differences between the military and civilian pre-hospital environments. Thus, the representativeness of the sample is limited. Moreover, being of a cross-sectional type, the research does not allow making any

				This combination may potentially lead to moral injury and compassion fatigue. Therefore, mutual trust at organizational level as well as among EMS personnel is essential.	conclusions regarding the causal relationship while the use of self-reported stress measurement is associated with certain biases and underreporting issues.
Ericsson et al. (2021) <i>BMC Public Health</i> (2021) 21:1789	Finnish paramedics' professional quality of life and associations with assignment experiences and defusing use – a cross sectional study	Explore Finnish paramedics' professional quality of life, using the Professional Quality of Life Scale, with associations to EMS assignment experiences as well as formal and informal defusing need and use over a	Quantitative study involving 257 Finnish paramedics with cross-sectional design. The study outcomes involved secondary traumatic stress (STS), compassion satisfaction (CS), and burnout (BO) score through a modified 9-item Short Professional Quality of Life scale (ProQOL). Recollections of assignment experiences and	The medians for the Short ProQOL scores were: STS = 4.00 (IQR 3); BO = 6.00 (IQR 3) and CS = 13.00 (IQR 3). STS and BO were related to experiences of social emergencies and traumatic events; BO related to experiences of threat situations ($r = 0.206$, $p = .001$). Perceived need for defusing was associated with STS ($r = 0.178$, p	Social media-based data collection led to sampling bias. Lack of information about background, geography, and education created potential confounders. Reliability of the methods that rely on recall is under criticism. Self-reporting method, a number of missing values was noted. Post-

		12-month period.	defusing of the participants from a 12-month period were obtained through Likert-type scales. Association was measured using the Spearman's correlation coefficient.	< .001), but informal defusing was participated in by the paramedics. There was no relationship between participation in any kind of defusing and ProQOL scores.	hoc changes to Short ProQOL Scale limited the study due to novelty of the scale and problems with comparing it to previous studies. Finally, cross-sectional observational design cannot prove any causal linkages or time relationships.
Giaume et al. (2024) <i>Prehospital Emergency Care</i> (2024) 8(2):342-351	FIRECARE : An Evidence-Based Prevention Program to Reduce Burnout among Prehospital Caregivers: Benefits of a Combined Mindfulness	To evaluate the effects of the FIRECARE program (a mindfulness intervention, supplemented by heart coherence training and positive psychology	A quasi-experimental two-group design with wait-list control and pretest-posttest design was employed. This intervention involved six weeks of weekly meetings with each session lasting for 2.5 hours and including individual daily	A total of seventy-four participants took part in the study, of whom 66 completed the study. Out of these participants, 60% of the participants were in the moderate burnout category, which is the 'burnout cluster'. Comparison between the	The sample was small, and no randomized controlled trial was performed. The control group was not a real control group but rather a waitlist control group. The experiment was performed within just one French ALS ambulance

	s, Heart Coherence Training, and Positive Psychology Intervention	workshops) on burnout, secondary stress, compassion fatigue, and mindfulness among advanced life support ambulance staff of the Paris Fire Brigade.	meditation and coherence training. In addition, the study examined the differences between intervention and waitlist control groups as well as differences in changes from pre to post-program and 3-months follow-up of burnout (measured with the ProQOL-5 scale) and mindfulness (measured with FMI scores). Preprogram burnout (ProQOL-5) was measured and controlled for in the analysis.	intervention and waitlist control groups revealed a significant reduction in the burnout score in the burnout cluster ($p = 0.0003$; partial eta squared $= 0.18$). Nevertheless, whereas the secondary stress decreased in the burnout cluster, this change was witnessed in participants in the intervention group but not in the waitlist group, whose secondary stress increased ($p = 0.003$; partial eta squared $= 0.12$). Pre-post intervention comparison between the two groups also showed that the burnout score	unit, which means that there could be some kind of emotional contamination between the participants of the two groups working together. There was a great difference between the two groups at the beginning of the experiment in regard to the burnout cluster. Namely, there were more people with burnout in the intervention group than in the waitlist control group..
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				reduced in the burnout cluster ($p = 0.006$; partial eta squared $= 0.11$). In addition, in a three month follow-up, the burnout score reduced in the intervention group ($p = 0.02$; partial eta squared $= 0.07$) while there was an increase in the acceptance ($p = 0.007$) and mindfulness scores ($p = 0.05$; partial eta squared $= 0.05$) in the baseline burnout cluster.	
Taskan et al. (2026) <i>Discovery Public Health</i> (2026) 23, 489	A national cross-sectional assessment of emotional labor and compassion fatigue	Examine the levels of emotional labour and compassion fatigue among Emergency Medical Services	The cross-sectional study was carried out from January to May 2024 on 405 EMS and UMKE employees operating in Ankara, Konya, Kayseri, and Antalya, Türkiye.	Major differences in compassion fatigue and subdomains were found by age, gender, marital status, education level, working style, and professional title ($p < 0.05$).	First, the cross-sectional nature of the design makes it impossible to draw any causative conclusions between compassion fatigue, emotional

	among emergency response personnel in Turkey.	(EMS) and National Medical Rescue Team (UMKE) personnel deployed in disaster zones, and to explore their associations with sociodemographic and occupational factors.	The data were gathered by means of demographic form, Compassion Fatigue Scale, and Emotional Labor Scale. Construct validity was analyzed using confirmatory factor analysis with 10,000 bootstrap samples, whereas reliability was tested through Cronbach's alpha. Differences between groups were made using proper parametric and non-parametric tests with Bonferroni correction, and relationship between variables was established through Spearman's correlation and regression.	Significant differences were also noted regarding the emotional labor scale by age, gender, marital status, education level, and working style ($p<0.05$). On the other hand, according to the findings of Spearman's correlation, there were some significant correlations between compassion fatigue (and subdomains) and emotional labor (and subdomains) ($p<0.005$). At total scale, there was a significant and positive correlation between compassion fatigue and emotional labor ($r=0.282$, $p<0.001$),	labor, and sociodemographic/occupational factors. In addition, data collection was carried out using self-reporting questionnaires that are susceptible to social desirability and recall bias. Moreover, the study was conducted among EMS and UMKE employees in only four provinces of Türkiye, and thus its results cannot be generalized beyond these four provinces or any other region and country, and to non-emergency healthcare workers. Also, there were several
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				implying that the relation was small-to-moderate. Multiple regression showed that the subdomains of emotional labor explained 18.4% of the variation in compassion fatigue ($R^2=0.184$; Adj $R^2=0.178$; $p<0.001$), while only surface acting had a significant positive effect on.	possible confounding factors such as a history of previous psychological problems, coping mechanisms, and organizational support that were not accounted for.
Trindade et al. (2025) <i>Revista Brasileira de Enfermagem</i> (2025) 78(2):e20230367	Compassion fatigue in emergency care professionals	Assess the level of compassion fatigue in healthcare professionals working in emergency services and its association with socio-professional characteristics	Cross-sectional study, conducted in 2022 and 2023, which involved 186 healthcare professionals. A socio-occupational questionnaire and the Professional Quality of Life Scale 5 was employed.	Satisfaction with compassion is shown higher average values than burnout syndrome and Secondary Traumatic Stress. The age of the respondent and the number of his/her children are associated with satisfaction with	In this case, since it is an empirical research, there is not much understanding about the phenomenon. In this regard, it is not possible for the researcher to identify the subjectivity, historicity, and

		.		compassion. These variables and experience in the health care area are inversely proportional to the values of burnout syndrome. Besides, the more education the respondent had, the less was Secondary Traumatic Stress.	context of the phenomenon along with the real experience of the participants. This is because of the standardized response provided by the participants.
Dehghannezhad et al. (2020) <i>Australasian Journal of Paramedicine</i> (2020) 17:1-7	A. Compassion Satisfaction and Compassion Fatigue among Emergency Medical Technicians in Iran	Identifying the link between compassion satisfaction and compassion fatigue is important to enhance patient care.	This is a descriptive correlation study where 248 participants were chosen randomly through cluster sampling from the pre-hospital emergency centres of East Azarbaijan, Iran. Instruments used in the study include quality of life for professionals such as compassion satisfaction and	Mean scores for compassion satisfaction and compassion fatigue were moderately high. A reverse correlation and mean negative correlation coefficient ($r = -0.40$) was established between the two factors. In the “compassion fatigue” factor, the sub-factor	A couple of limitations can be identified in the current study, which indicate cautious interpretation of the results. Firstly, the current study is limited because of the location of the study, where only one province located in the northwest of Iran

			compassion fatigue (burnout and secondary traumatic stress). Data analysis was done using Stata Statistical Software Release 14, and correlation between the variables studied using Pearson and Canonical Correlation analysis.	secondary traumatic stress had a higher focal loading (0.96) compared to the sub-factor burnout (0.32). Factors that significantly correlated with compassion fatigue included education, work, and workload. Compassion satisfaction correlated with marriage and workplace.	was examined. Secondly, participants in the current study were only male EMTs. Thus, the general findings of the study should be interpreted with caution because they cannot be generalized for all pre-hospital staff in Iran and any other country. With regards to the findings and limitations of the current study, future research can focus on attitudes and perceptions of female EMTs towards compassion satisfaction and fatigue.
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Ondrejková & Halamová (2022) <i>Health & Social Care in the Community</i> (2022) 30, 1680–1694	Prevalence of compassion fatigue among helping professions and relationship to compassion for others, self-compassion and self-criticism	Explore the prevalence and differences in compassion fatigue among different helping professions. We also wanted to explore the relationship between compassion, self-compassion, self-criticism and compassion fatigue.	Six hundred and seven individuals in helping professions were selected for participation. These individuals include 102 nurses, 44 doctors, 57 paramedics, 39 home nurses, 66 teachers, 103 psychologists, 40 psychotherapists/coaches, 76 social workers, 39 priests/pastors, and 41 police officers. The data was collected through an online survey battery assessing compassion, self-compassion, self-criticism, compassion fatigue and compassion satisfaction.	Differences between various levels of compassion fatigue were identified in different groups of helping professionals. No large differences were noted regarding the compassion and self-compassion levels shown by people with moderate compassion fatigue compared to those with low compassion fatigue levels. At the same time, there was a significant link between high levels of compassion fatigue and higher levels of self-criticism. Self-criticism proved to be the most	Limitation of this study includes the fact that the research was done during the COVID-19 outbreak, which affected the helping professions adversely. This might have influenced the findings in general. The COVID-19 might have increased the work load of psychologist and psychotherapist under the conditions of lock downs and social distancing. As the sample used for the research was non-representative in nature, there were
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				effective predictor of compassion fatigue.	disproportionate representation of male and female respondents, more female participants were present because men are less likely to respond to an online survey.
Beres et al. (2022) <i>Journal of Trauma Nursing</i> (2022) 29(4), 210-217	Addressing Compassion Fatigue in Trauma Emergency and Intensive Care Settings: A Pilot Study	To investigate the feasibility of a 12-week pilot of structured debriefing sessions and its impact on compassion fatigue experienced by emergency and intensive care health care professionals after patient death.	The study was a 12-week feasibility pilot study carried out between March and May 2021 in an urban and academic hospital setting that was a 300-bed Level II Trauma Center located in the Midwest. The study employed a pre-intervention/post-intervention design to test the feasibility of the use of structured debriefing by traumatized health care	The intervention period included 20 debriefing sessions among 56 health care professionals: 37 (80%) registered nurses, 10 (5.6%) respiratory therapists, and 5 (11.2%) nursing assistants and emergency medical technicians. The debriefing process accounted for nearly half of all deaths of patients (38%). There were no statistically	The study was carried out on a small number of participants who were willing to take part in the debriefing interviews. There was just one EMT involved in the study and only one postintervention survey filled by an EMT tech, which limits the generalizability of our results to these two types of professionals.

					professionals following patient deaths. Compassion fatigue was evaluated using the Professional Quality of Life Measure survey. Univariate	significant changes in levels of burnout (M = 25.5, SD = 5.4, p = .47), secondary traumatic stress (M = 23.9, SD = 5.6, p = .99), and compassion	High turnover rates among employees and poor staff retention made it impossible to match preintervention and				
No.	Publicat ion	Resear ch gap identifi ed	Clear purpo se	Appropri ate methodol ogical design	descriptive statistics, independent unpaired t tests, and χ^2 tests examined the intervention impact.	satisfaction (M = 36.8, SD = 6.4, p = .61).	Ethical consid eration	Rigorous data analysis	Clear findin g state ment	post-intervention surveys, this may have also contributed to missing data in our survey analysis.	Qualit y rating
1.	Renkie wicz et al. (2021)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	High
2.	Crampto n (2014)	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Moderate
3.	Metcalf et al. (2022)	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Moderate
4.	Won et al. (2023)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High

Table 2: Quality Appraisal of the Included Studies

5.	Parker et al. (2024)	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Moderate
6.	Van Puyvelde et al. (2024)	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Moderate
7.	Ericsson et al. (2021)	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	High
8.	Giaume et al. (2024)	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Moderate
9.	Taskan et al. (2026)	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Moderate
10.	Trinidad et al. (2025)	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	High
11.	Dehghannezhad et al. (2020)	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Moderate
12.	Ondrejková & Halamová (2022)	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Moderate

13.	Beres et al. (2022)	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Moderate
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