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Professional quality of life and burnout among medical physicists working in radiation oncology: The role of alexithymia and empathy

Marialaura Di Tella[a], Valentina Tesio[a], Jenny Bertholet[b,c,d], Anne Gasnier[e], Elisabet Gonzalez del Portillo[f], Mateusz Spalek[b,g], Jean-Emmanuel Bibault[b,h], Gerben Borst[i], Wouter Van Elmpt[j], Daniela Thorwarth[k], Laura Mullaney[b,l], Kathrine Røe Redalen[b,m], Ludwig Dubois[b,j], Cyrus Chargari[b,e], Sophie Perryck[b,n], Steven Petit[b,o], Myriam Lybeer[p], Lorys Castelli[a], Pierfrancesco Franco[b,q,*]

[a] Department of Psychology, "ReMind the Body" Research Group, University of Turin, Italy
[b] European Society for Radiotherapy&Oncology (ESTRO) Young Committee, Brussels, Belgium
[c] Joint Department of Physics, The Institute of Cancer Research and the Royal Marsden NHS Foundation Trust, London, United Kingdom
[d] Division of Medical Radiation Physics, Department of Radiation Oncology, Inselspital, Bern University Hospital, Switzerland
[e] Radiotherapy Department, Gustave Roussy Cancer Campus, Villejuif, France
[f] Department of Radiation Oncology, University Hospital of Salamanca, Salamanca, Spain
[g] Department of Soft Tissue/Bone Sarcoma and Melanoma, Maria Sklodowska-Curie Institute - Oncology Center, Warsaw, Poland
[h] Radiation Oncology Department, Hopital Europeen Georges Pompidou, Universite Paris Descartes, Paris, France
[i] Department of Oncology, Radiation Oncology Department, The Netherlands Cancer Institute, Antoni van Leeuwenhoek Hospital, Amsterdam, The Netherlands
[j] The M-Lab, Department of Precision Medicine, GROW – School for Oncology and Developmental Biology, Maastricht University, Maastricht, The Netherlands
[k] Section for Biomedical Physics, University Hospital for Radiation Oncology Tubingen, Tuebingen, Germany
[l] Applied Radiation Therapy Trinity Research Group, Discipline of Radiation Therapy, School of Medicine, Trinity College Dublin, Dublin, Ireland
[m] Department of Physics, Norwegian University of Science and Technology, Trondheim, Norway
[n] Department of Radiation Oncology, University Hospital Zurich and University of Zurich, Zurich, Switzerland
[o] Department of Radiation Oncology, Erasmus Cancer Institute, Rotterdam The Netherlands
[p] ESTRO Office, Brussels, Belgium
[q] Department of Oncology, Radiation Oncology, University of Turin, Turin, Italy

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ABSTRACT

Background and purpose: The professional quality of life of radiation oncology professionals can be influenced by different contributing factors, including personality traits. Alexithymia involves deficits in emotion processing and awareness. Empathy is the ability to understand another's 'state of mind/emotion'. We investigated professional quality of life, including burnout, in radiation oncology, exploring the role of alexithymia and empathy and targeting the population of medical physicists (MPs), since this professional category is usually underrepresented in surveys exploring professional well-being in radiation oncology and MPs may experience professional distress given the increasing complexity of multimodal cancer care.

Material and methods: An online survey was addressed to ESTRO members. Participants filled out three questionnaires to evaluate alexithymia, empathy and professional quality of life: a) Toronto Alexithymia Scale (TAS-20); b) Interpersonal Reactivity Index (IRI); c) Professional Quality of Life Scale (ProQoL). Professional quality of life as per ProQoL was considered as dependent variable. The three domains of the ProQoL, namely compassion satisfaction (CS), secondary traumatic stress (STS) and burnout were correlated with alexithymia (as per TAS-20) and empathy (as per IRI with three subcategories: empathic concern, perspective taking and personal distress) and demographic/professional characteristics as independent variables. Generalized linear modeling was used. Significant covariates on univariate linear regression analysis were included in the multivariate linear regression model.

Results: A total of 308 medical physicists completed all questionnaires. Alexithymia as per TAS-20 was correlated to decreased CS ($\beta = -0.25$, $p < 0\ 0.001$), increased likelihood for STS ($\beta = 0.26$, $p < 0\ 0.001$) and burnout ($\beta = 0.47$, $p < 0\ 0.001$). With respect to empathy, the 'Empatic Concern' subscale of the IRI was found to be a significant predictor for increased CS ($\beta = 0.19$, $p = 0\ 0.001$) and increased STS ($\beta = 0.19$, $p < 0$

* Corresponding author at: Department of Oncology – Radiation Oncology, University of Turin School of Medicine, Via Genova 3, 10126 Turin, Italy.
E-mail address: pierfrancesco.franco@unito.it (P. Franco).

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0.001), without significant correlation with burnout. The individual's perception of being valued by own's supervisor was correlated to increased CS ($\beta = 0.23$, $p < 0.001$), and decreased burnout ($\beta = -0.29$, $p < 0.001$).

Conclusions: Alexithymic personality trait increased the likelihood to develop burnout, with less professional satisfaction amongst MPs working in radiation oncology. Empathy results in higher professional fulfilment. These results may be used to benchmark preventing strategies, including peer support, debriefing sessions, leadership initiatives and work-load limitation strategies.

1. Introduction

Medical physicists (MPs) are professionals who apply the principles and methods of physics to medicine. They are highly involved in different steps of diagnosis and treatment of patients [1]. MPs working in the field of radiation oncology play a leading role in the implementation and safe utilisation of advanced technologies employed on cancer patients, providing expert advice on the development of new treatment techniques and the optimisation of therapeutic processes. As part of the multi-disciplinary team working in radiation oncology, MPs ensure the safe administration of state-of-the-art radiotherapy [2,3].

Given the central role of MPs in the definition and success of treatments for radiation oncology patients, they can often be exposed to consistent pressure from colleagues and supervisors which may lead to personal and professional distress. It is a common perception that most of the professional distress experienced by healthcare providers involved in oncology is due to breaking bad news to patients and being confronted with death and suffering on a daily basis. This is definitely accurate, but, in recent years, the increasing complexity of multimodal cancer care introduced new challenges for health professionals who are required to govern treatment in all details, even if they do not have a direct contact with patients [4]. This may constitute a source of professional distress also for professional figures such as MPs, who are normally underrepresented within the surveys addressing professional quality of life amongst oncology professionals. It is hence important to provide data on well-being at work and risk for professional distress and burnout also for this professional category, focusing on both the environmental stressors and the intrinsic characteristics modulating the final level of job satisfaction.

Burnout is a syndrome resulting from chronic work-related stress, which consists of three sequential components: emotional exhaustion, depersonalisation, and low personal accomplishment [5,6]. Burnout is negatively correlated to professional quality of life (QoL) and has been linked to reduced quality of care, more errors, job withdrawal, and absenteeism [7-9].

Personal characteristics may play a key role in determining how individuals react and deal with stressful situations, as it may be the case for MPs working in radiation oncology. Among these factors, there is growing evidence that difficulties in adequately recognizing one's own emotions (i.e. alexithymia) are associated with a variety of interpersonal issues, including social isolation and maladaptive behaviours [10]. Alexithymic individuals typically show limited capacity to process emotional information, with resulting difficulties in identifying, understanding, and expressing their own feelings. In the working environment, these characteristics may lead to difficulties in coping with highly stressful and challenging situations, which in turn may increase the risk of occupational burnout for the individuals themselves [11].

Similarly, empathy, defined as "the ability to experience and understand what others feel without confusing oneself with others" [12], is a core dimension of social functioning, enabling individuals to understand, share, and respond to the emotions, gestures, thoughts, and experiences of others [13]. Growing evidence suggests a potential direct link between empathy and burnout. For instance, it has been shown that empathy was positively associated with personal accomplishment, but inversely related to burnout in a group of medical students [14].

Based on these observations, the PROject on Burn-Out in RadiatioN Oncology (PRO BONO) was carried out to assess the professional QoL, including burnout, amongst radiation oncology professionals and to explore the potential relationships with alexithymia and empathy [15]. The present report focuses on the population of MPs, trying to fill the knowledge gap about this professional category.

2. Methods

2.1. Participants and procedure

PRO BONO was developed within the Young European Society for Radiotherapy and Oncology (yESTRO) Committee and targeted ESTRO members. Participants were invited to participate voluntarily (May-October 2018) via email, social media and other ESTRO communication channels. The questionnaire was administered to the participants through an online survey software (SurveyMonkey Inc., San Mateo, California, USA; www.surveymonkey.com). An anonymised, individual and unique code to complete the survey was provided to the participants. Before completing the questionnaires, respondents were asked to provide sociodemographic (i.e. age, gender, and marital status) and work-related information (i.e. years in the field, on call shifts, perception of being valued by colleagues and supervisor).

2.2. Measures

Alexithymia was assessed using the Toronto Alexithymia Scale (TAS-20) [16]. It comprises twenty items, each scored on a five-point Likert scale. The results are presented employing the TAS-20 total score and three subscale scores: Difficulty Identifying Feelings (DIF), which measures the inability to distinguish specific emotions, or between emotions and the bodily sensations of emotional arousal; Difficulty Describing Feelings (DDF), which assesses the inability to verbalize one's emotions to other people; and Externally-Oriented Thinking (EOT), which evaluates the tendency of individuals to focus their attention externally and not on the inner emotional experience [16]. The TAS-20 cut-off scores are as follows: $\leq$ 51 no alexithymia, 52–60 borderline alexithymia, $\geq$ 61 alexithymia.

The scale has shown good internal consistency (Cronbach's alpha: $\geq$ 0.70) and test-retest reliability [15].

The Interpersonal Reactivity Index (IRI) was administered for the assessment of self-reported empathy [17,18]. The IRI comprises twenty-eight items, rated on a five-point Likert scale, which explores four dimensions of empathy: 'Fantasy', which refers to the tendency to transpose oneself imaginatively into the feelings and actions of fictitious characters; 'Perspective-Taking', which evaluates the tendency to spontaneously adopt the psychological point of view of others; 'Empathic Concern', which assesses the degree to which one experiences feelings of warmth, compassion and concern for an observed individual; and 'Personal Distress', which evaluates the feelings of fear, apprehension and discomfort at witnessing the negative experiences of others [17,18]. The scale has shown good internal consistency (Cronbach's α ranging from 0.70 to 0.78) and test-retest reliability [17,19].

Professional QoL was assessed using the Professional Quality of Life Scale (ProQoL), version 5 [20,21]. It consists of thirty items rated on five-point Likert scale, which assess two main aspects of professional QoL: compassion satisfaction (positive dimension) and compassion

fatigue (negative dimension). Particularly, the Compassion Satisfaction Scale (CSS) evaluates the pleasure derived from being able to perform one's job well. Conversely, the compassion fatigue (CF) includes both the Burnout Scale (BS), which assesses feelings of hopelessness, exhaustion, frustration and difficulties in performing one's job effectively, and the Secondary Traumatic Stress Scale (STSS), which concerns negative feelings (e.g. fear, sleep difficulties, intrusive images) driven by work-related secondary exposure to excessive or traumatic stressful events.

Based on the corresponding percentile scores defined in the ProQoL Manual, participants can be classified into low (score below the 25th percentile), average (25th-75th percentile), and high (score above the 75th) groups for each scale [20,21]. The scale has shown good internal consistency (Cronbach's α ranging from 0.72 to 0.87) and test–retest reliability [20,21].

The data on the sociodemographic and work-related characteristics are presented in Table 1 and in Appendix A. Of the 419 MPs participating in the survey, 308 (74%) fully completed all the questions, whereas 111 (26%) failed to complete the entire survey. The response rate was 54% (419/770). The comparisons between those who completed and those who did not in terms of sociodemographic and work-related characteristics showed no statistically significant differences on any of the assessed variables, with the only exception of age (dropout participants were younger than completers) (Appendix A). Participants who fully completed the survey had a mean age around 40 years and were equally distributed between men and women (50.3% vs 49.7%). The majority had a professional experience of < 10 years and stated they felt valued by supervisor and/or colleagues in the workplace (Table 1).

2.3. Statistical analyses

The statistical analyses were carried out with the Statistical Package for Social Science, version 25.0 (IBM SPSS Statistics for Macintosh, Armonk, NY, USA: IBM Corp.). For each of the questionnaire employed, Cronbach's alpha was calculated as a measure of internal consistency and scale reliability. It was calculated as a function of the number of test items and the average inter-correlation amongst them. A reliability coefficient ≥ 0.6 was considered acceptable. Indices of asymmetry and kurtosis were used to test for normality of the data. Values for asymmetry and kurtosis between −1 and +1 were considered acceptable in order to prove normal univariate distribution. First, planned independent *t*-tests or Fisher exact tests were used to compare sociodemographic and work-related variables between completers and dropout participants. Second, exploratory Pearson (*r*) or point-biserial (r_{pb}) correlations were computed to evaluate the possible relationships between variables. Finally, three planned hierarchical multiple regression analyses were used to assess whether alexithymia, empathy, and work-related variables were significant predictors of each dimension of professional QoL evaluated by means of the ProQoL (i.e. CSS, BS, and STSS). In case of statistical significance, age, gender, and marital status were inserted into the first regression block, alexithymia into the second block, empathy into the third. Lastly, professional variables were inserted into the fourth block, using a stepwise method for variable inclusion. To avoid unnecessary reductions in statistical power, predictors were included in the regression models only when they were significantly correlated ($p < 0.05$) with the dependent variables (ProQoL scales). Collinearity was assessed through the statistical factor of tolerance and Variance Inflation Factor (VIF).

3. Results

All variables included in the analyses were normally distributed. As a measure of internal consistency, in our sample, the Cronbach's alpha was good for the TAS-20 total score (α score = 0.74), acceptable/very good for the IRI subscales (α scores ranging from 0.65 to 0.81) and good/very good for the ProQoL subscales (α scores ranging from 0.73 to 0.85).

3.1. Alexithymia, empathy, and professional quality of life

The descriptive data on alexithymia, empathy, and professional QoL of the total sample are shown in Table 2. Almost 14% of the participants showed the presence of alexithymia, while an additional 21% displayed alexithymic traits at a borderline level. Regarding empathy, participants scored highest on the 'Empathic Concern' subscale of the IRI, while the lowest scores were reported on the 'Personal Distress' subscale. Finally, concerning professional QoL, a considerable proportion (30%) of MPs reported high scores on the 'Burnout Scale' of the ProQoL, most likely to experience feelings of hopelessness and difficulties in doing own's job effectively.

3.2. Correlations and multivariate regressions

The preliminary correlational analyses between the predictor (alexithymia, empathy and work-related characteristics) and the dependent variables (three domains of the professional QoL) can be seen in Table 3, highlighting the impact of both alexithymia and empathy, together with supervisor's appreciation, on the well-being at work of radiation oncologists. In particular, the final models for each of the regression analyses performed are shown in Table 4 and Supplementary material and will be herein detailed.

Regarding ProQoL_CSS, the full model of age, alexithymia, empathy, and work-related variables to predict compassion satisfaction was statistically significant (Table 4). Particularly, age, TAS-20 total score, 'Empathic Concern' and 'Perspective Taking' subscales of the IRI, and the individual's perception of being valued by their supervisor were found to be significant contributors of the final model (Table 4 – ProQoL_CSS).

For ProQoL_BS, the final model explained a significant amount (43%) of the burnout variance. Significant predictors in the final model were found to be the TAS-20 total score, the 'Perspective Taking' subscale of the IRI, and the individual's perception of being valued by their supervisor (Table 4 – ProQoL_BS).

Finally, regarding the ProQoL_STSS, the full model of gender, alexithymia, empathy, and work-related variables to predict secondary

Table 1
Sociodemographic and work-related data of the MPs working in radiation oncology (n = 308).

	Mean (SD)	n (%)
Age (years)	40.0 (9.6)	
Gender		
M		155 (50%)
F		153 (50%)
Marital Status		
Single		74 (24%)
Married/Cohabitant		219 (71%)
Divorced		15 (5%)
Widowed		0 (0%)
Year in the field		
≤10		142 (46%)
> 10		166 (54%)
N_shifts		
No		181 (59%)
Yes		127 (41%)
V_Supervisor		
No		73 (24%)
Yes		235 (76%)
V_Colleagues		
No		37 (12%)
Yes		271 (88%)

N_Shifts: 'On call' shifts; V_Colleagues/Supervisor: perception of being valued by colleagues/supervisor.

Table 2
Alexithymia, empathy, and professional QoL scores of the MPs working in radiation oncology (n = 308).

	M (SD)	n (%)
Alexithymia		
TAS_Total	48.1 (10.2)	
Non alexithymic		202 (66%)
Borderline		64 (21%)
Alexithymic		42 (13%)
TAS_DIF	16.0 (5.8)	
TAS_DDF	12.8 (3.8)	
TAS_EOT	19.3 (3.6)	
Empathy		
IRI_PT	2.5 (0.7)	
IRI_FS	2.2 (0.8)	
IRI_EC	2.7 (0.6)	
IRI_PD	1.5 (0.6)	
Professional QoL		
ProQoL_CSS	36.6 (5.7)	
Low		93 (66%)
Average		153 (21%)
High		62 (13%)
ProQoL_BS	26.1 (5.5)	
Low		64 (21%)
Average		151 (49%)
High		93 (30%)
ProQoL_STSS	21.8 (5.8)	
Low		98 (32%)
Average		139 (45%)
High		71 (23%)

TAS-20: Twenty-item Toronto Alexithymia Scale; TAS-20_DIF: Difficulty identifying feelings subscale of the Toronto Alexithymia Scale; TAS-20_DDF: Difficulty describing feeling subscale of the Toronto Alexithymia Scale; TAS-20_EOT: Externally oriented thinking subscale of the Toronto Alexithymia Scale; IRI_PT: Perspective Taking subscale of the Interpersonal Reactivity Index; IRI_FS: Fantasy subscale of the Interpersonal Reactivity Index; IRI_EC: Empathic Concern subscale of the Interpersonal Reactivity Index; IRI_PD: Personal Distress subscale of the Interpersonal Reactivity Index; ProQoL_CSS: Compassion Satisfaction Scale of the Professional Quality of Life Scale; ProQoL_BS: Burnout Scale of the Professional Quality of Life Scale; ProQoL_STSS: Secondary Traumatic Stress Scale of the Professional Quality of Life Scale.
'Low' and 'High' refer to a score below the 25th percentile or above the 75th percentile, respectively, whereas 'Average' includes the intermediate scores.

traumatic stress was statistically significant. Particularly, TAS-20 total score, 'Empathic Concern' and 'Personal Distress' subscales of the IRI, perception of being valued by supervisor, and years in the field were found to be significant predictors (Table 4 – ProQoL_STSS). In all regression analyses, the statistical factor of tolerance and VIF did not indicate any interfering interaction between the variables.

4. Discussion

The present study aimed at assessing professional QoL, including burnout, amongst MPs working in radiation oncology and to explore potential associations with alexithymia, empathy, and work-related variables.

The results showed that a large number of MPs reported symptoms of burnout, displaying feelings of distress and difficulties in performing their job well. These results are in line with previous evidence, which found moderate to high levels of burnout amongst MPs [4–9]. Jasperse et al. assessed burnout in German radiation oncology professionals, finding that MPs reported significantly less personal accomplishment than the other groups (i.e. radiation oncologists, radiation therapists, and radiation nurses) [8]. Furthermore, the study of Sehlen et al. showed that MPs working in New Zealand, although reporting lower stress rates than physicians, nurses, and radiation therapists, expressed many different sources of work-related stress, such as 'time pressure', 'underpayment', and 'ill-defined responsibilities' [4].

Table 3
Correlations between sociodemographic and work-related variables, alexithymia, empathy, and Professional Quality of Life dimensions (n = 308).

	ProQoL_CSS	ProQoL _BS	ProQoL _STSS
Age (r)	0.13*	0.01	0.04
Gender (r_{pb})	0.01	−0.02	0.15*
Marital status[#] (r_{pb})	0.09	−0.06	−0.03
Years in the field (r_{pb})	0.06	0.09	0.12*
Do you do 'on call' shifts? (r_{pb})	0.06	0.01	0.10
Do you feel valued by your supervisors? (r_{pb})	0.31**	−0.41**	−0.23**
Do you feel valued by your colleagues? (r_{pb})	0.24**	−0.32**	−0.22**
TAS-20 (r)	−0.38**	0.57**	0.33**
IRI_PT (r)	0.31**	−0.29**	0.04
IRI_FS (r)	0.18**	−0.06	0.18**
IRI_EC (r)	0.30**	−0.17**	0.18**
IRI_PD (r)	−0.17**	0.24**	0.33**

Pearson (r) or point-biserial (r_{pb}) correlation has been used, as appropriate.
* $p < 0.05$; ** $p < 0.001$.
TAS-20: Twenty-item Toronto Alexithymia Scale; IRI_PT: Perspective Taking subscale of the Interpersonal Reactivity Index; IRI_FS: Fantasy subscale of the Interpersonal Reactivity Index; IRI_EC: Empathic Concern subscale of the Interpersonal Reactivity Index; IRI_PD: Personal Distress subscale of the Interpersonal Reactivity Index; ProQoL_CSS: Compassion Satisfaction Scale of the Professional Quality of Life Scale; ProQoL_BS: Burnout Scale of the Professional Quality of Life Scale; ProQoL_STSS: Secondary Traumatic Stress Scale of the Professional Quality of Life Scale.
[#] Marital status has been dichotomized in Married/Cohabiting or Single/Divorced/Widowed.

Table 4
Final models of the hierarchical multiple linear regressions predicting ProQoL Compassion Satisfaction (ProQoL_CSS), Burnout (ProQoL_BS), and Secondary Traumatic Stress (ProQoL_STSS) scales scores from sociodemographic variables, alexithymia, empathy, and work-related variables (n = 308).

Predictors	R^2	Adj R^2	F	B	SE B	β	p
ProQoL_CSS	0.27	0.26	22.8**				
Age				0.07	0.03	0.12	0.020
TAS-20				−0.14	0.03	−0.25	< 0.001
IRI_EC				1.65	0.47	0.19	0.001
IRI_PT				0.95	0.48	0.11	0.047
V_Supervisor				3.06	0.68	0.23	< 0.001
ProQoL_BS	0.43	0.42	74.95**				
TAS-20				0.26	0.03	0.47	< 0.001
IRI_PT				−0.90	0.37	−0.11	0.015
V_Supervisor				−3.72	0.58	−0.29	< 0.001
ProQoL_STSS	0.25	0.24	16.69**				
Gender				0.98	0.61	0.09	0.110
TAS-20				0.15	0.03	0.26	< 0.001
IRI_EC				1.72	0.48	0.19	< 0.001
IRI_PD				2.06	0.55	0.21	< 0.001
V_Supervisor				−1.93	0.71	−0.14	0.007
Y_field				1.60	0.59	0.14	0.008

* $p < 0.05$; ** $p < 0.001$
ProQoL_CSS: Compassion Satisfaction Scale of the Professional Quality of Life Scale; ProQoL_BS: Burnout Scale of the Professional Quality of Life Scale; ProQoL_STSS: Secondary Traumatic Stress Scale of the Professional Quality of Life Scale; TAS-20: Twenty-item Toronto Alexithymia Scale; IRI-EC: Empathic Concern subscale of the Interpersonal Reactivity Index; IRI_PT: Perspective Taking subscale of the Interpersonal Reactivity Index; V_Supervisor: perception of being valued by supervisor; Y_field: years in the field (less or more than 10 years).

Our results showed that alexithymia, empathy, and work-related variables were significantly related to both burnout and the other components of professional QoL. With respect to the compassion satisfaction dimension, in our study, the TAS-20 total score, the 'Empathic Concern' and 'Perspective Taking' subscales of the IRI, and the

perception of being valued by supervisor were found to be significant predictors for the ProQoL_CSS. Particularly, the presence of alexithymia was found to be negatively associated with the levels of compassion satisfaction, while both empathy and supervisor approval were found to be positive contributors. Coherent results were found for the burnout component. However, in this case, high levels of alexithymia were found to be positively associated with the ProQoL_BS, whereas 'Perspective Taking' subscale of the IRI and perception of being valued by supervisor were found to be negative predictors of this dimension. Finally, concerning the secondary traumatic stress component, alexithymia, empathy (specifically empathic concern and personal distress dimensions), and years in field were found to be positively related to the ProQoL_STSS, while a greater feeling of supervisor approval was found to be negatively associated with this factor.

Taken together these findings suggest a negative effect of alexithymia on professional QoL, with enhanced levels of distress and burnout in MPs reporting high levels of alexithymia. No previous study has examined the relationship between alexithymia and burnout in MPs. However, similar results were found in other populations of workers [11,22,23]. Particularly, the study of Mattila et al. showed that alexithymia was a significant predictor of both emotional exhaustion and professional inefficacy components of burnout in a group of healthcare professionals working in emergency departments, even when controlled for confounding factors (i.e. sociodemographic and health-related variables, and depressive symptoms) [11]. Similarly, alexithymia was positively related to emotional exhaustion and lack of personal accomplishment in female medical students, while it was found to be positively associated with depersonalization in males [23].

Beyond alexithymia, more prominent empathic capacities, as well as a higher perception of being valued by a supervisor, seem to be protective factors against burnout and professional distress. No previous study has examined the relationship between either empathy and supervisor's approval and burnout in MPs. Nevertheless, in line with our results, previous studies showed a negative association between empathy and burnout in healthcare professionals [24–26]. Particularly, the study of Taleghani et al found that empathy was negatively correlated with both overall burnout score and depersonalization and personal accomplishment components in a sample of Iranian oncology nurses [26]. Furthermore, Passalacqua et al, investigating burnout in a group of psychiatry residents, showed a significant positive correlation between the emotional exhaustion dimension of burnout and the 'Personal Distress' subscale of the IRI, while negative associations were detected between the depersonalization dimension and both the 'Perspective Taking' and 'Empathetic Concern' subscales of the IRI [25].

In a similar way to empathy, the available evidence suggests a negative association between supervisor support and burnout symptoms [27,28]. The study of Weigl et al found, among others, that the relationship between emotional exhaustion and depressive state was strongest for nurses with low supervisor support [28].

The present data on the population of MPs working in radiation oncology are comparable to those reported for radiation oncologists, with similar rates for burnout (around 30%), alexithymia (around 13%) and a tantamount distribution with respect to empathic characteristics [15]. Similar patterns with respect to the negative correlation of alexithymia with professional well-being and the positive influence of empathy and supervisor's appreciation on compassion satisfaction were observed. A detailed analysis exploring the mediator role of professionalism on well-being at work amongst radiation oncology professionals is planned to better understand this dynamic.

The present study has some limitations. First, we used only self-reported instruments. This might have led to the underestimation of frank alexithymic traits in individuals falling into borderline cut-off scores. Performance-based instruments or structured interviews, less dependent on the individuals' awareness, should be employed in addition to traditional self-reported measures. Secondly, cross-sectional studies do not allow certain conclusions about causal direction to be drawn. Longitudinal studies are needed to better clarify the effect of alexithymia and empathy on the levels of professional QoL over time. Thirdly, although the use of univariate analysis to select variables for multivariate analysis has been widely employed in the previous literature, it could be a source of error, causing for instance the rejection or inclusion of inappropriate variables in the multivariate analysis model [29]. Moreover, only MPs were considered for the present study. Comparing results in the MP population with those of other radiation oncology professionals may help to better understand the association between professional QoL and personality factors in the different specialists working in the field. Finally, no specific data with respect to the individual working environment of MPs were collected (research vs clinical duties; small vs large departments; MP vs radiation oncologist as supervisor).

Despite these limitations, the present study represents the first attempt to assess professional QoL and the possible associations with both individual characteristics (i.e. alexithymia and empathy) and work-related variables in MPs practicing in radiation oncology. The current findings highlight the importance of enhancing emotional competencies in MPs, in order to promote the positive dimensions of professional QoL and reduce the levels of distress and burnout experienced in the clinical practice. Dyadic (one-to-one) peer support could be a useful option in this context, to enhance emotional, informational and practical functioning of the professional, with assistance provided by a peer trained supporter in terms of peer mentoring, reflective listening and counselling. Our findings also show the importance, for professionals working in the field of medical physics dedicated to radiation oncology, to be positively recognized by own's supervisor and, by extension, by the whole professional community. This makes cogent the general recognition of the MP profession.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.phro.2020.07.001.

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