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Is medical training solely to blame? Generational influences on the mental health of our medical trainees

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ABSTRACT

Introduction: The negative impact of medical training on trainee mental health continues to be a concern. Situated within a sociocultural milieu, Generation Z and Generation Y, defined by their highly involved parents and the widespread use of technology, currently dominate undergraduate and graduate medical education respectively. It is necessary to explore medical trainees' generational characteristics and job-related factors related to stress, burnout, depression, and resilience. This might provide different perspectives and potential solutions to medical trainees' mental health.

Methods: A cross-sectional study was conducted among medical trainees (students and residents) from two institutions in Qatar. A self-administered online survey included measures for trainees' social media overuse, their parent's parenting style, the educational support by the clinical teacher, job (demands, control, and support), and work-life balance and their relation with their stress, burnout, depression, and resilience. Relationships were tested with multiple linear regression analyses.

Results: Of the 326 medical trainees who responded, 142 (44%) trainees – 93 students and 49 residents – completed all items and were included in the analysis. Social media overuse and inability to maintain a work-life balance were associated with higher levels of stress, depression, and student burnout. Higher levels of job support were associated with lower levels of stress, depression, and resident burnout, and a higher level of resilience. Job control was associated with lower burnout levels. Parenting style was unrelated to trainees' mental health.

Discussion: The two generations 'Y' and 'Z' dominating current medical training showed more stress-related complaints when there is evidence of social media overuse and failure to maintain a work-life balance, while job support counterbalances this, whereas parenting style showed no effect. Measures to enhance medical trainees' mental health may include education about the wise use of social media, encouraging spending more quality social time, and enhancing job support and job control.

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Introduction

Despite wide leadership concerns regarding medical trainees' (students' and residents') well-being and initiatives to develop resilience interventions, they are recognized to have a high magnitude of stress and burnout, which may lead to serious consequences such as depression, suicidal ideations, and a decline in empathy and professional development [1–7]. Medical students and residents/fellows are more likely to exhibit symptoms of depression than the population control samples [2]. Depression or depressive symptoms are prevalent among medical students (27.2%) and resident physicians (28.8%) [4]. Suicidal ideation is reported by 11.1% of medical

students and 17.4% of physicians [8,9]. Factors previously related to medical trainee mental health were deeply rooted in the learning and work environment such as work compression, excessive workload, and inadequate support from faculty staff, and peers [10] rather than individual characteristics [11].

Millennials, also termed Generation Y (born between 1981 and 1995) and the newer Generation Z (born roughly between 1995 and 2012), at the time of writing are the most prevalent generations in postgraduate and undergraduate medical training respectively. These two generations comprise a heterogeneous group of individuals who have many differences from their predecessors [12–14]. Generational differences result from an

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individual's situatedness within a sociocultural milieu rather than essential, intrinsic qualities unique to those born within a specified – and socially constructed – time frame [15]. Despite attention to the special characteristics of these predominant generations in regard to curriculum reform, assessment methods, and the incorporation of technology into their teaching, little is known about those related to their mental health within the medical education context [15,16].

Studies refer to Generation Y's competitive nature and their feeling of being special, unique, and deserving of attention and admiration from others [17]. They have a more developed external locus of control and less self-reliance and coping strategies compared to previous generations [18,19]. These reflect the efforts of their overinvolved, highly encouraging parents who tend to intervene and 'save' their children from difficult situations. This may foster their dependency on others, and ineffective coping skills that eventually impair their physical, social, and emotional development and negatively affect their psychological wellbeing [20–23]. Similarly, the newer Generation Z is characterized by being active problem solvers and independent learners who are motivated by a desire to please others and get ahead through hard work. They are encouraged by their parents that 'winners win as a result of hard work' [14,24]. Yet they are thought to be 'bubble-wrapped' due to helicopter parenting [25] with overreliance on adults during their formative years rendering them less well-prepared for adulthood [26], which may pose an even greater challenge for maintaining their emotional health [27]. The overreliance of these two generations on their parents with the resultant lack of preparedness for adulthood may be compensated by either support within demanding, stressful medical training or support attained through spending quality time outside the workplace [28,29]. Although there are concerns about parenting's influence on trainees' mental health, this is yet to be investigated within the medical context.

With the explosion of technology into every facet of their lives, both generations are unique in their use of technology. Generation Y is referred to as 'digital natives,' and the 'instant messaging generation' whereas Generation Z is the first generation to have had smartphones present throughout their adolescence resulting in widespread social media use by medical trainees [13,30–33]. Despite finding this enjoyable, enhancing access to information, aiding their communication with their educators, and fostering communities useful as means for supportive, professional, and social learning, there are warnings against the potential harms of social media use [33,34]. A strong fear of missing out can lead to difficulty disconnecting from technology, and an inclination to spend more time online and less with each other in person [14]. Individuals who spend more time on media are prone to information overload,

which can lead to stress, frustration, dissatisfaction, loss of control, and feelings of being overwhelmed [35,36]. Studies showed that social media use is linked to decreased feelings of happiness [32] and increased incidence of anxiety, sleep deprivation, and occasionally extreme feelings of inadequacy, depression, and suicidal ideation [37–40]. Depressive and suicidal feelings increase with screen time and social media exposure, leading to less emotionally resilient and more insecure people [26,41]. However, the literature exploring associations between the use of social networking sites and anxiety and depression [42,43] among medical trainees is scarce.

The Conservation of Resources (COR) theory posits people are motivated to acquire, protect, and foster the acquisition of those things that they value – their resources. Stress occurs when key resources are threatened with loss when key resources are lost, or when there is a failure to gain key resources following significant effort [44]. Resources used to mitigate stress are categorized to be either personal (located within, such as individual characteristics, traits, and energies) or contextual (external resources such as work environment and social support). To achieve a state of wellbeing, people seek to obtain, retain, and protect resources that are central in relation to keeping and increasing motivation [45]. Many studies have highlighted the significant psychological distress related to the work environment, medical training, and academic pressure [2,46]. Coping skills, which allow people to thrive on challenges, depend on their personal resources that enhance resiliency such as self-efficacy, self-control, ability to engage support and help, learning from difficulties, and persistence despite blocks to progress [47]. This is viewed as a way for individuals to manage stress and engage in learning despite mental pressure. The COR theory can help in understanding the interplay of these resources in the medical trainees' mental health from the perspective of generational situatedness of Generation Y and Z.

Taken together, Generation Y and Z entering stressful high-demand medical training may lack personal resources because these are either underdeveloped by their parents' parenting style or because of being exhausted through social media overuse. This can be further aggravated by their inability to gain contextual resources such as support within the demanding clinical training environment, or outside their workplace. This exploratory study seeks to examine medical trainees' mental health from the perspective of their generational situatedness. As such, the study aims to explore the association of the trainees' levels of stress, burnout, depression, and resilience with the generational characteristics such as the social media overuse and parents' parenting style together with the job resources, job demands, and work-life balance.

Methods

Study design and context

We conducted a cross-sectional online survey study of two populations of trainees: all medical students at the National College of Medicine at Qatar University and all residents from the Accreditation Council for Graduate Medical Education International accredited residency programs at Hamad Medical Corporation, Qatar. As per the college student affairs office, medical students do not work and either depend on their parents financially, attain scholarships upon maintaining high academic scores, or receive free tuition if they are of Qatari nationality. In contrary, residents receive salary and are financially independent. Study approval was obtained from both institutions' Ethical Review Boards (MRC 01-20-127 and QU-IRB 1352-EA/20).

Sampling and recruitment

All medical students and residents received an emailed invitation to complete an online survey between November 2020 and January 2021. Participation was voluntary, without any compensation, and all participants were provided with informed consent and ensured anonymized data analysis and confidential data collection and analysis. Contact numbers for support services numbers were provided at the end of the survey should students feel the need to seek help.

Survey

Before administration, the complete survey was pilot tested with five medical students and five residents, no adjustments were required based on their feedback. The self-administered survey consisted of three sections. The first section addressed the trainee's level (student/resident) and questions about gender, age, nationality, marital status, spouse employment status and the number of children (if any), years in training, living conditions, and maternal and paternal educational levels. The second section included the independent variables, the generational situatedness factors that were assessed using the Helicopter Parenting Instrument, a combined social media overuse (SMO) scale, the Job Content Questionnaire (JCQ), the Maastricht Clinical Training Questionnaire (MCTQ), and Work-life Balance (WLB).

The combined social media overuse (SMO) scale is 15-item scale that was developed by combining nine self-developed items on social media pressure that is based on a corporate survey from the UK and interviews with medical students [48], and the validated 6-item Bergens Social Media Addiction scale (Cronbach's $\alpha = .88$ [49,50]). These 15 items were combined as all assess the pressure exerted by the overuse of social media, an example is 'I feel

a need for looking at social media on my phone when I'm studying'. The items are answered on a five-point Likert scale ranging from very rarely/never (1) to very often/always (5). The 15-item Helicopter Parenting Instrument (HPI) was used to measure trainees' perceptions of their parents' parenting style [21]. An example is, 'My parent tries to make all of my major decisions.' Participants rate the items on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). With an internal consistency of .80, the HPI items are not gender-specific as other parenting scales and thus allow respondents to freely interpret which parent (or both parents) is best described by the inventory [21].

Job control and job support were measured by using the 22-item JCQ, rated on a Likert scale ranging from one (strongly disagree) to five (strongly agree) [51]. It is divided into three subscales with acceptable reliability: job demands (5 items; $\alpha = .63$); job control (9 items; $\alpha = .72$), and job support (4 items; co-worker support $\alpha = .77$, 4 items; supervisor support, $\alpha = .84$) [51]. The educational support by the clinical teacher was measured using the 22-item MCTQ that measures modeling, coaching, scaffolding, articulation, exploration, reflection, and the general learning climate, ranging from strongly disagree (1) to strongly agree (5), and finally an overall judgment of the clinical teacher performance at the workplace (scale 1–10) [52]. The MCTQ was shown to reliably measure one overarching construct which is the apprenticeship or the teaching quality of clinical teachers with an evidenced high Cronbach's alpha of .93 [52,53]. Work-life balance was assessed using a four-item survey where participants reflected on the balance between their work and non-work activities on a five-point scale, ranging from 'strongly disagree' (1) to 'strongly agree' (5) [54]. A sample item is 'I currently have a good balance between the time I spend at work and the time I have available for non-work activities'. The internal consistency is of good level Cronbach's alpha was .94 [54].

The last section of the survey comprised the dependent variables: the mental health outcomes (stress, burnout, depression, and resilience). We requested trainees to consider their feelings and training over the past month when completing the survey. Stress was measured using the 10-item-Perceived Stress Scale that assesses the degree of appraisal of life situations as unpredictable and beyond control, causing an additional burden to an individual [55]. All items are rated on a 5-point Likert scale from 0 (never) to 4 (very often) with sample items such as 'In the last month, how often have you felt nervous and stressed?' and 'In the last month, how often have you been able to control irritations in your life?' Higher mean scores indicate greater levels of perceived stress. In a previous study, Cronbach's alpha constantly surpassed the standard .70 threshold ranging between .74–.91 [56].

Residents were asked to fill out the Maslach Burnout Inventory-General Survey (MBI-GS) to measure their perceived burnout utilizing three subscales: emotional exhaustion (9 items) depersonalization (5 items), and personal accomplishment (8 items) [57]. Participants read 22 statements about their feelings towards medical training such as ‘I feel used up at the end of the workday’ and rated each on a 7-point Likert scale (0 = never, 1 = a few times a year, 2 = once a month, 3 = a few times a month, 4 = once a week, 5 = a few times a week, 6 = every day). Students filled out the 15-items-Maslach Burnout Inventory-Student Survey (MBI – SS) which is preferred as its item formulation was adapted to the undergraduate environment and included questions such as ‘Studying or attending classes all day is really a strain for me’ [58]. Subscales included emotional exhaustion (5 items), cynicism (4 items), and efficacy (6 items). All items are scored on a 7-point Likert scale from 0 (strongly disagree) to 6 (strongly agree) [22,58]. High scores on emotional exhaustion are generally considered an indication of the risk for burnout [59].

Depression was assessed through the Patient Health Questionnaire depression (PHQ-2), which contains two items: (1) ‘Over the past 2 weeks, how often have you been bothered by the following problems: little interest or pleasure in doing things’ and (2) ‘Feeling down, depressed or hopeless’ [60]. An answering scale ranging from ‘not at all’ (1?) to ‘almost every day’ (4) was used. The Cronbach’s alpha coefficient of the PHQ-2 was .79 in previous research [60,61].

Resilience was measured by using the Connor-Davidson Resilience Scale (CD-RISC), which is a 10-item scale that was extracted from the original 25-item CD-RISC [62]. It reflects the ability to tolerate experiences such as change, personal problems, illness, pressure, failure, and painful feeling (item’s examples: ‘Able to adapt to change’, ‘Tend to bounce back after illness or hardship’, and ‘Can stay focused under pressure’). Each item is rated on a 5-point Likert scale from 0 (not true at all) to 4 (true nearly all the time). It had shown high internal consistency (Cronbach’s $\alpha = .85$) [62].

Data analysis

For all scales, mean scores and Cronbach’s alphas were calculated. Pearson correlation coefficients were computed and collinearity testing was performed to determine whether multiple-way collinearity existed among the independent variables [63]. No variables had achieved a level of collinearity that would bias the modeling process. The characteristics of these generations and their association with the trainees’ mental health outcomes were evaluated using multiple regression analyses in a backward procedure, in line with our

aim to explore the relationships between dependent and independent variables. Age, gender, and graduate level have been shown to impact mental health and were controlled for if significant. A $p < .05$ was considered statistically significant for our analyses. Data were analyzed using Statistical Package for Social Sciences (SPSS®) version 27 (IBM Statistics for Windows; IBM Corp, Armonk, New York, USA).

Results

Of approximately 700 total trainees, 326 trainees (46%) responded by at least partially filling out the survey. The full survey (i.e., all scales) was completed by 142 trainees who were included in the study analyses. We checked for possible differences between the 326 respondents who partly filled out the survey and the 142 respondents who completed all items, and found no statistical differences on the dependent variables (range of p -value between .17 and .86). We therefore consider the subsample of 142 trainees to be representative for all respondents. Eighty-five (59.9%) of the respondents were females and 57 (40.1%) were males. There was more representation of medical students ($n = 93$, 65.5%) among the studied population than the residents ($n = 49$, 34.5%). As expected, the mean age among medical students was 19.0 years ($SD = 1.9$), and 30.0 years among residents ($SD = 5.7$). Most participants’ nationalities were from the Middle East ($n = 110$, 77.5%) and live in nuclear families ($n = 125$, 86.2%). Study participants’ characteristics are shown in the [Appendix](#).

Table 1 demonstrates the descriptive statistics of mental health outcomes of the respondents. The calculated scales’ alpha scores of all scales showed good internal consistency with Cronbach’s α ranging between .67 and .91 as shown in Table 1. Because we used two different surveys for burnout, one for students and one for residents, we analyzed and reported them separately. In the following sections, both medical students and residents are referred to as medical trainees.

Generational characteristics related to trainees’ mental health – the personal resources

Table 2 shows the results of the regression analyses for mental health outcomes. Regarding the importance of personal resources, the analyses showed that medical trainees with higher levels of SMO exhaust their personal resources: there is a strong positive association of SMO with higher levels of stress ($\Delta R^2 = .17$, $p < .001$) and depression ($\Delta R^2 = .09$, $p < .01$). Moreover, our findings showed that SMO is associated with medical students’ burnout ($\Delta R^2 = .04$, $p < .05$) but not with residents. At the same time, we see higher levels of

Table 1. Descriptive statistics of the personal and contextual resources together with the mental health outcomes.

Scales (min.-max. score)	<i>a</i>	All trainees		Residents		Students	
		<i>N</i>	<i>M (SD)</i>	<i>N</i>	<i>M (SD)</i>	<i>N</i>	<i>M (SD)</i>
Personal resources							
Social Media Overuse (1–5)	.91	142	3.01 (0.69)	49	2.81 (0.67)	93	3.11 (0.67)
Parenting Style (1–5)	.72	142	1.68 (0.52)	49	1.67 (0.61)	93	1.68 (0.47)
Contextual resources							
Work-life balance (1–5)	.87	142	2.38 (0.95)	49	2.77 (0.93)	93	2.16 (0.89)
Clinical Training (1–5)	.96	142	3.49 (0.68)	49	3.68 (0.60)	93	3.39 (0.70)
Job Control (1–5)	.67	142	3.47 (0.53)	49	3.63 (0.49)	93	3.40 (0.54)
Job Demand (1–5)	.68	142	3.59 (0.54)	49	3.53 (0.47)	93	3.63 (0.57)
Job Support (1–5)	.85	142	3.47 (0.63)	49	3.65 (0.67)	93	3.37 (0.59)
Mental Health outcomes							
Stress (0–4)	.87	142	2.27 (0.72)	49	1.92 (0.68)	93	2.46 (0.68)
Burnout (0–6)		142					
Students' Burnout	.86	93	4.31 (1.15)	-	-	93	4.31 (1.15)
Residents' Burnout	.90	35	2.56 (1.32)	35	2.56 (1.32)	-	-
Depression (1–4)	.72	142	2.29 (0.90)	49	1.82 (0.78)	93	2.54 (0.86)
Resilience (0–4)	.87	142	2.66 (0.62)	49	2.74 (0.55)	93	2.62 (0.65)

Table 2. Significant regression weights ($p < .05$) of the variables predicting mental health outcomes among medical trainees, in antecedent order.

Dependent variable	<i>N</i>	<i>R</i> ²	ΔR^2	Independent variable	<i>B</i>	<i>SE B</i>	β	<i>p</i>
Stress	142	.42	.19	Work-life balance	-.27	.05	-.36	<.001
				Social media overuse	.30	.07	.29	<.001
				Job support	-.25	.08	-.21	<.01
				Gender	.24	.10	.16	.02
				Age	-.03	.01	-.23	<.01
Depression	142	.30	.14	Job support	-.41	.11	-.29	<.001
				Social media overuse	.30	.10	.23	<.01
				Age	-.03	.01	-.23	<.01
				Work-life balance	-.15	.07	-.16	.03
				Job demand	.67	.19	.33	<.01
Students' burnout	93	.32	.14	Work-life balance	-.32	.13	-.25	.02
				Social media overuse	.37	.16	.22	.02
				Job control	-.41	.20	-.19	.04
				Job support	-1.24	.40	-.43	<.01
Residents' burnout	34	.39	.15	Job support	-.79	.29	-.38	.01
				Job support	.18	.08	.18	.03

SMO among students than among residents $t(140) = -2.53$, $p < .05$ with a mean score of 3.11 for students ($SD = .67$) and 2.81 for residents ($SD = .67$). Parenting style did not show any association with any of the studied mental health outcomes. All regression analyses were controlled for gender and age. Gender was found to be only statistically significant associated with stress levels among female than with male trainees ($\Delta R^2 = .02$, $p = .02$). Age was associated with trainees' levels of depression: the younger the trainees, the higher their levels of depression ($\Delta R^2 = .06$, $p < .01$).

Generational characteristics related to trainees' mental health – the contextual resources

Failure to gain contextual resources – maintaining WLB ($\Delta R^2 = .19$, $p < .001$) and job support ($\Delta R^2 = .05$, $p < .01$) – was found to be associated with trainees' high levels of stress. There were similar associations of these resources with trainees' depression levels: Job support ($\Delta R^2 = .14$, $p < .001$), and WLB ($\Delta R^2 = .02$, $p = .03$). The most important contextual resources that were linked to students' burnout were lack of maintaining WLB and high job demand (ΔR^2

$= .14$, $p = .02$ and $\Delta R^2 = .14$, $p < .01$ respectively). Failure to gain contextual resources such as job support and control was found to be associated with higher levels of residents' burnout. The latter was also found to be associated with medical students' burnout. Finally, job support was the only contextual resource that was found to have an association with medical trainees' resilience ($\Delta R^2 = .03$, $p = .03$).

Table 2 shows that, overall, the overuse of social media as well as a lack of WLB and job support were found among the most frequent variables that showed a positive association with stress and depression. SMO and lack of WLB are associated with higher levels of burnout, particularly in medical students. Job support was consistently found to be a crucial contextual resource that is negatively associated with trainees' stress, depression, burnout, and the only variable that is linked to trainees' resilience. Having control at the workplace was only found to be associated with medical trainees' burnout.

Discussion

This study examined the personal and contextual demands and resources among 142 medical trainees

such as SMO, parenting style, support during medical training, and work-life balance in relation to their stress, burnout, depression, and resilience. This allowed us to better understand the interplay of the personal and contextual resources in relation to currently predominant Generation Y and Generation Z medical trainees' mental health.

The most striking finding of this study was the association between SMO and trainees' mental health outcomes. SMO was strongly associated with their levels of stress and depression. Overuse of social media might exhaust the trainees' personal resources. Extensive screen time and social media exposure lead to sleep deprivation, and occasionally extreme feelings of inadequacy, loneliness, and isolation resulting in less emotionally resilient and more insecure trainees [26]. The negative outcomes can however also be explained by SMO refraining them from real social contact which was found to be a source of frustration among doctors [64]. Our finding is consistent with a study that linked increased social media use with an increased risk of anxiety and depression among medical students [42]. In addition, although previous research showed that factors within the learning and work environment, rather than individual attributes, are the major drivers of burnout [28], we found that SMO was linked with high levels of burnout among our student population. The fact that we did not find this effect for residents coincides with the fact that we saw more intense overuse of social media among medical students when compared to residents. Earlier studies showed an increased social media use in the younger student population [33,65] especially among Generation Z who spent more time with electronics and on the Internet than any previous generation [27]. The overload generated by the SMO in the daily routine is perceived as a burden with difficulty in adapting [35] which could be further augmented by the high demand faced by medical students. Therefore, Generation Z entering medical training possibly may have exhausted their personal resources through SMO which might make them more susceptible to stress, burnout, and depression.

Likewise, our study is the first to investigate the association of parenting style among medical trainees as a factor that might result in their underdeveloped personal resources and thus relate to their mental health. The lack of self-reliance, more dependency on others, and lack of coping skills among Generation Z and Generation Y were previously shown to be the result of their helicopter parenting style [20,22,26]. Our study showed low mean scores of helicopter parenting style among our sample, and a lack of association with the medical trainees' mental health outcomes. This might be related to cultural context, however, literature shows larger detrimental effects of helicopter parenting in collectivist cultures than in

individualistic cultures [66,67]. In collectivist cultures, like the context of our study, university students do not work and depend on their parents financially during their university education. Parents are regarded as authorities in the family and are responsible for their children's success, even in adulthood. In our study, we nevertheless found low helicopter parenting levels. Moreover, the resilience found in our sample might have decreased the likelihood of exhibiting depression, anxiety, and stress symptoms even in the case of over-protective parenting, in line with the literature [67]. Our study showed that trainees' resilience was higher when they received more support at the workplace. This emphasizes the environment in which an individual must survive may support or undermine his or her resilience [47].

We expected the depletion of contextual resources due to high academic pressure and demand at the workplace during medical training to be associated with higher levels of trainee stress. Our findings indeed indicate that loss of contextual resources such as failing to maintain a good WLB and lack of job support are associated with trainee stress and depression. This coincides with previous work where a poorly maintained WLB and dissatisfaction with faculty staff's support were found to be strongly related to stress, anxiety, and burnout among medical students and residents [11,29,68,69], and adds to previous work its relationship with trainees' depression. Despite the intense residents' workload compared with medical students [3], our findings suggest an association between job demand and lack of maintaining WLB with medical students' levels of burnout, while we did not find so for residents. This could be probably due to the lack of adjustment of the medical students at the initial stage of their medical training [28] during which adaptation and connectedness to the new clinical environment is crucial for medical students in transition [70]. In addition, the unpredictable and uncontrollable workload among residents makes it difficult for them to effectively engage in self-care activities [71], and job support might help to mitigate this.

Lack of job control is another example of lost contextual resource that was associated with increased levels of medical students and resident burnout. Generation Y embrace collaboration, cognitive diversity, collective leadership, and autonomy [72] similar to Generation Z who sees themselves as compassionate problem solvers and creative learners who thrive with more autonomy. Our findings are consistent with previous work that showed lack of control and limited autonomy was linked to both students' and residents' stress and burnout [28,73,74] while higher ratings of autonomy support predict better student and residents' well-being [75,76]. Therefore, despite the demanding medical

training, contextual resources such as WLB, job control and support seem to play a vital role in trainee mental health outcomes during medical training.

Theoretical and practical implications

The findings of this study are in line with The Conservation of Resources theory in that these demonstrate the interplay of personal and contextual resources in mitigating trainees stress, depression, and burnout and foster resilience during medical training. From a personal resources perspective, the increased use of social media in the dominating generations Y and Z might have detrimental effects on medical trainees mental health. Additionally, our findings emphasize the importance of contextual resources such as maintaining a balance between work and non-work-related activities, and nurturing trainee support and control at work that might affect the mental health of medical trainees. The COR theory is thus also highly applicable in an educational training context.

The findings of this study could inform undergraduate and graduate medical education leaders and educators to acknowledge the potential effects of social media overuse in the current generation Z, yet at the same time to assess what degree of social media use is appropriate and far from risk. Educating trainees about wise social media use is proposed as an important mental health preventive measure. Similarly, it is worthwhile to encourage fostering a work-life balance and maintaining life activities outside the medical training. Promoting support and autonomy at the workplace is equally important in mitigating trainees' stress, depression and burnout.

Limitations and directions for future research

Our population may not represent all social strata of the medical student populations in Europe and Northern America, which often have specific programs for students with disadvantaged backgrounds. This might limit the generalizability of the findings, although it is not clear in which direction. Students from lower socioeconomic backgrounds, who rely on their aspirational values rather than environmental factors [77], may be more resilient, and therefore the current study may have overestimated stress levels. In addition, the lack of association with parenting style necessitates the need for a multicultural study and a qualitative approach to understand this among medical trainees within different contexts.

Another limitation is that we based our conclusion on a self-perceived cross-sectional survey with a limited sample size and we were not able to test causal relationships. There may be reversed causality: stressed respondents might have rated their job characteristics more negatively. In addition, the survey

was sent to trainees at different training levels with variations in their exam and vacation timings, which might have played a role in their levels of stress and other mental health outcomes in addition to the variables studied. Further, despite the use of validated tools to measure mental health outcomes, they are self-perceived screening tools and do not diagnose mental health problems. Moreover, survey respondents might tend to underreport socially undesirable activities and overreport socially desirable ones due to social desirability bias. Therefore, a longitudinal approach would be ideal with incorporating qualitative methodology to obtain richer data. This would allow for further elaboration on this study's findings and improve our understanding of the social media types and rationale behind their use by medical trainees in relation to their mental health and investigate potential solutions that are likely to benefit them.

Conclusion

This study provides new insights into the mental health of both undergraduate and graduate medical trainees from a generational situatedness perspective. The two generations 'Y' and 'Z' showed more stress-related complaints when there is evidence of social media overuse. Therefore, education on its wise usage is advisable. Maintaining a good work-life balance, support, and control at the workplace are crucial contextual resources for fostering medical trainees' mental health. We recommend to encourage the trainees to maintain life activities outside medical training and foster supervisors' and co-workers' job support, while enhancing job control and autonomy at the workplace.

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Appendix

The overall demographic characteristics of the 142 participants who completed the total set of questions and who were included in the analysis.

Factor	Total	Postgraduate trainee	Undergraduate trainee
<i>N</i>	142	49 (34.5%)	93 (65.5%)
<i>Age, median (IQR)</i>	21(8)	30.0 (27.0, 31.0)	19.0 (18.0, 21.0)
<i>Gender</i>			
<i>Male</i>	57 (40.1%)	30 (61.2%)	27 (29.0%)
<i>Female</i>	85 (59.9%)	19 (38.8%)	66 (71.0%)
<i>Year of training/Education</i>			
<i>Year 1</i>	47 (33.1%)	19 (38.8%)	28 (30.1%)
<i>Year 2</i>	31 (21.8%)	9 (18.4%)	22 (23.7%)
<i>Year 3</i>	24 (16.9%)	9 (18.4%)	15 (16.1%)
<i>Year 4</i>	26 (18.3%)	9 (18.4%)	17 (18.3%)
<i>Year 5</i>	8 (5.6%)	1 (2.0%)	7 (7.5%)
<i>Year 6</i>	6 (4.2%)	2 (4.0%)	4 (4.3%)
<i>Nationality</i>			
<i>Middle East</i>	110 (77.5%)	37 (75.5%)	73 (78.5%)
<i>Other</i>	32 (22.5%)	12 (24.5%)	20 (21.5%)
<i>Marital Status</i>			
<i>Single</i>	113 (79.6%)	21 (42.8%)	92 (98.9%)
<i>Married</i>	29 (20.4%)	28 (57.1%)	1 (1.1%)
<i>Higher educational level attained by the father</i>			
<i>Below Bachelor</i>	32 (22.5%)	7 (14.3%)	25 (26.9%)
<i>Bachelor degree</i>	65 (45.8%)	25 (51.0%)	40 (43.0%)
<i>Postgrad. Qualification</i>	45 (31.6%)	17 (34.7%)	28 (30.1%)
<i>Higher educational level attained by the mother</i>			
<i>Below Bachelor</i>	45 (31.6%)	19 (38.8%)	26 (28.0%)
<i>Bachelor degree</i>	78 (54.9%)	24 (49.0%)	54 (58.0%)
<i>Postgrad. Qualification</i>	19 (13.4%)	6 (12.2%)	13 (14.0%)
<i>No. of children</i>			
<i>No children</i>	125 (88.1%)	32 (65.3%)	93 (100%)
<i>Has children</i>	17 (11.9%)	17 (34.6%)	0 (0%)
<i>Living type</i>			
<i>Alone</i>	18 (12.7%)	16 (32.7%)	2 (2.2%)
<i>Nuclear Family</i>	125 (86.2%)	33 (67.3%)	91 (97.8%)