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Interplay between personal and professional growth in Italian medical education

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Abstract

Introduction Generational change is impacting medical education and driving the adaptation and reform of teaching and clinical practice to successfully educate the next generation of physicians. Aim of the study was to establish undergraduates' needs by analyzing the strengths and weaknesses of their soft skills from the start of medicine school.

Method We conducted a cross-sectional study to evaluate the personalities and soft skills of first-, third-, and sixth-year undergraduates in medical school. Of the eligible participants ($N = 333$), 127 of them (38.1%) were evaluated for their soft skills. The assessment was based on psychological and behavioral assessments.

Results Results showed the strong need of the young to understand themselves and know how to improve their personal growth during academic study. Mediation statistical analyses showed significant direct and indirect effects of the factors (year level in medical school) and mediators (conscientiousness/extroversion and openness) on the soft skills indexes. Conscientiousness was a predictive factor for all soft skills examined: self-determination ($\beta = 0.54$), resilience ($\beta = 0.48$), empathy ($\beta = 0.36$), assertiveness ($\beta = 0.24$), social support ($\beta = 0.18$), and teamwork ($\beta = 0.30$). Openness was correlated and predictive for empathy ($\beta = 0.19$). The model of the multilayered construct of medical competence represents a fruitful framework and using the lens of Self-Determination theory, medical undergraduates could be engaged and buffered against the stressors of patient care.

Discussion In this scenario, the interaction with medical leaders is relevant, clinical trainers and medical undergraduates should model the professional learning; escalated clinical skills should build advanced knowledge in medicine.

Keywords Generation z, Medical school, Soft skills, Personality, Healthcare professions education, Personal growth, Medical competence, Medical leaders, Inter-professional learning

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Introduction

Transformations in healthcare professions education (HPE) have been presented as a lever to achieve meaningful societal change and generate reforms that are more authentically aligned with evolving health needs [1]. The most relevant challenge for HPE is dealing with a new generation of undergraduates called Generation Z (or Gen Z) as future medical school graduates. Gen Z is composed of people born between 1997 and 2010 and is the demographic cohort succeeding Millennials and the preceding Generation Alpha (Fig. 1).

Generational cut-offs are generally determined by sociologists, demographers, and cultural analysts who look at significant social, economic, and technological trends that shape the experiences of people born during specific time periods. The cut-off years can vary slightly depending on the source, but there are some common factors that influence these determinations. Social determinats take care of shift in societal norms, such as changes in family structures, education, and work-life balance, can also help define generational boundaries.

Generations in medical education

Gen Z has been identified using various labels, such as Centennials, Digitarians, iGen, Plurals, Post-Millennials, and Zoomers, because of their cultural and social determinants. Regarding their involvement in educational systems, Gen Z has grown in the digital age surrounded by technology and social media; thus, their learning style is influenced by their use of technology and their exposure to a constant stream of information [2]. Naidu and Ramani [3] debated the global transformation of HPE from a sustainability perspective towards addressing the needs of the current generation without compromising the needs of future generations. Generational change is impacting medical education and driving the adaptation and reform of teaching to successfully educate the next generation of physicians. Generations differ in their perspectives on personal life and work and have different expectations that must be addressed by their teachers, mentors, coaches, and leaders. As highlighted by Eckleberry-Hunt et al. [4], Gen Z is an active problem solver; independent learner; and advocate for social justice, fairness, equality, and the environment. In comparison with previous generations, Gen Z spends more time with electronics and the Internet and less time socializing face-to-face, with reports showing higher levels of unhappiness, less emotional resilience, and more insecurity amongst this group. In educational programmes, Gen Z is not interested in listening to lectures for long periods and prefers hands-on experience, on-the-job learning, and customized feedback. This generation wants to know what is needed to succeed in the moment [5], mirroring their experiences with social media [2]. As Gen Z is accustomed to obtaining information on demand, they may procrastinate until the last minute to complete assignments and expect instructors to become available. They lack the skills to critically evaluate information and require this training via engaging methods (e.g. journalling, discussions, and reflections) [2, 6]. Gen Z represents a new challenge for medical education programmes as their life perspective, learning proficiency, and individual needs do not fit traditional medical school education. Resilience and well-being are currently hot topics in medical education and practice [2, 4, 7]. Given the profile of Gen Z, medical students from this generation are exposed to many stressful factors that may reinforce a fixed mindset, including emphasis on grades, rankings, and performance in standardized examinations; perceived high cost of struggles or failures; and continuous normative comparisons with peers in high-stakes learning environments [8].

Self-determination theory

Engaging medical undergraduates seems to be a key aspect of Gen Z education. As some scholars have proposed [7–10], Self-Determination Theory (SDT) offers a scenario to support Gen Z, bridging the generational divide between undergraduates and teachers and informing how generations approach learning. SDT is a broad framework for understanding the factors that facilitate or undermine intrinsic motivation, autonomous extrinsic motivation, and psychological wellness, all of which are directly relevant to educational settings [11]. The overview of SDT shows that human behaviour is self-motivated and self-determined and is based on three basic psychological needs: (a) autonomy (sense of having choices), (b) relatedness (sense of connectedness

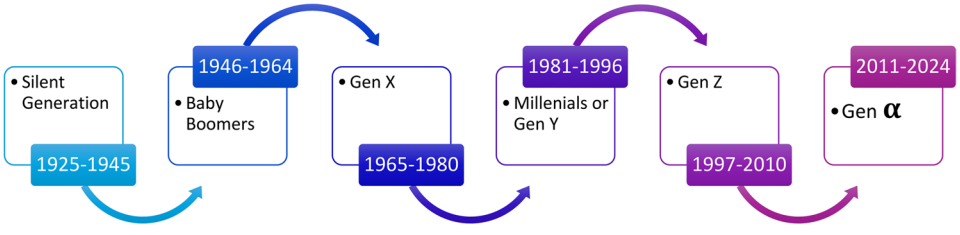

Fig. 1 Timeline of generational progression

with others), and (c) competence (sense of effectiveness). Individuals must satisfy all of these needs to achieve health and wellness [12]; the failure to satisfy the needs for autonomy, competence, and relatedness will result in diminished growth, integrity, and wellness [13]. SDT can bridge individual psychological and health profession education perspectives to help medical school leaders anticipate and respond to learners' needs. Medical schools must ensure that their graduates deliver safe and effective patient care.

In Italian medical education the learners' and teachers' needs are turning complex; following that, the ongoing medical curriculum transformation by Italian University Minister [14] is underlining the emerging multilayered construct based on technical and transversal competence: the young generation should be enhanced by the heterogeneous and simultaneous harmonic development of professional competence.

Recently, the Italian Research and University Minister granted a National Project (MOOD Project) [15] focused on supporting undergraduates in medical education to implement clinical training and model the health mindset of future Gen Z medical doctors. Specific work packages were oriented towards individual counselling to empower their transversal skills along with years of education, promoting subjective wellness and a complex physician mindset.

Considering the National Action of the MOOD Project, this study aims to establish undergraduates' needs by analyzing the strengths and weaknesses of their soft skills from the start of medicine school. This study also intends to contribute to the profiling of the individual dimensions of Gen Z undergraduates' needs by measuring positive personality traits and soft skills, to better tailor teaching methods and leadership to Gen Z learning potentiality and thereby efficiently model future Gen Z medical doctors.

Methods

Participants

The participants comprised 127 active medical undergraduates (60.6% females) who were enrolled in the study via institutional e-mail. A 94-item questionnaire was created using the SurveyMonkey platform and disseminated between October 2023and March 2024. The inclusion criteria were as follows: (a) active medical undergraduates and (b) submission of written informed consent. Those who did not meet any of the inclusion criteria were excluded using the gated question method.

Measures

The assessment was based on two parts: demographic data and psychological and behavioral assessments. The demographic data comprised age, gender, and year level in medical school. As detailed herein, the psychological measure was based on a standardized test (Big Five Inventory-10 [BFI-10]) aimed at assessing positive personality dimensions whilst the behavioral assessment was based on transversal competence (Soft Skills Inventory [SSI]).

BFI-10 [16]. This self-administered questionnaire measures the five personality dimensions of agreeableness, conscientiousness, emotional stability, extroversion, and openness. It comprises 10 questions with responses on a 5-point Likert-type scale. Agreeableness describes an individual's tendency to put the needs of others before one's own; conscientiousness describes a person's tendency to be persistent and determined in achieving their goals; emotional stability describes an individual's response to stress; extroversion refers to the degree of pleasure experienced through social relationships; and openness refers to openness to creativity, non-conformism, and originality. The Italian version of BFI-10 was applied. The reliability of the test was indicated by a Cronbach's $\alpha > 0.90$.

SSI [17]. This self-report questionnaire is designed to evaluate the soft skills of young adults. The self-report instrument is developed to assess intra- and interpersonal skills, as well as professional skills that may be associated with the academic success of higher education students. The 49 items that compose the SSI were organized into six theoretically meaningful and internally consistent measures: (a) self-determination refers to managing the self and the learning process; (b) resilience concerns the handling of challenges; (c) empathy is the capacity to understand the verbal and non-verbal communication of sentiments and feelings; (d) assertiveness refers to the use of culturally appropriate gestures and language; (e) social support refers to the fostering of social networks, sharing of opinions and resources, and collaboration in tasks; and (f) teamwork consists of working with others, especially as part of a team, in negotiations, and in displaying intercultural competence. Adapted Italian version was applied: a preliminary study was conducted by research team involving the original Author obtaining the permission to use it. The reliability of the test was indicated by Cronbach's $\alpha > 0.88$. The SSI indexes are shown in Fig. 2.

Procedure

The soft skill measurement activity was forwarded to medical undergraduates via institutional e-mail. The participants could voluntarily access the activity and complete it through individual sessions. Trained clinical psychologists (blinded to the study's objectives) conducted preliminary brief overview of the measurements. Informed consent was obtained at the time of enrolment. The interviews lasted for 15 min. The participants were then asked to fill out a web-based form

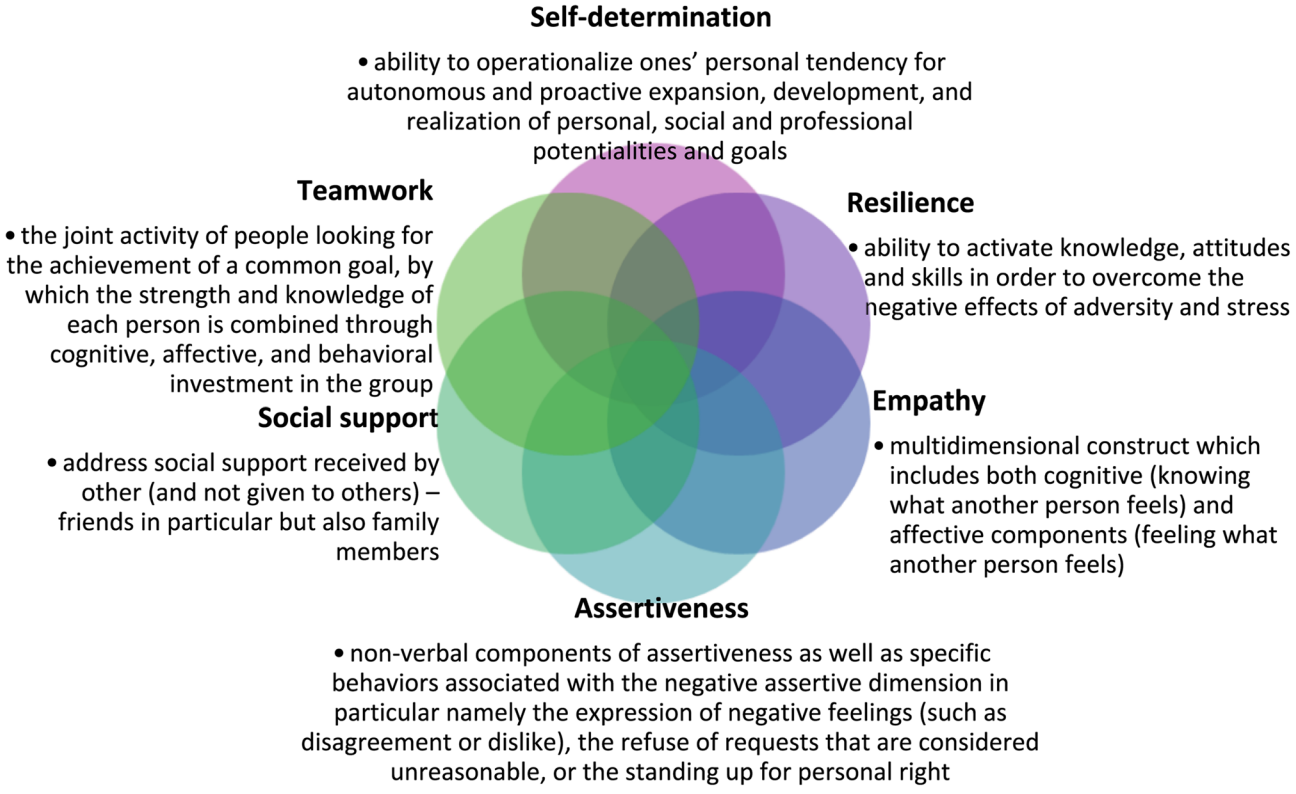

Fig. 2 Representation of SSI indexes

for collecting data on their soft skills. At the end of the measurement, each participant could ask for individual sessions to receive counselling regarding their own personal growth.

Study design

We conducted a cross-sectional study to evaluate the personalities and soft skills of first-, third-, and sixth-year undergraduates in medical school. Descriptive statistics (i.e. means, standard deviations [SD], and percentages) were calculated. A partial correlation analysis was conducted to examine the relationships between all the variables. Finally, a generalized linear mediation model analysis was conducted to verify the predictive value of the personality dimensions in the development of transversal competence.

Descriptive statistics and analysis of normality tests (Shapiro–Wilk test) were applied to examine the variables. Thereafter, Pearson's correlation test was conducted to verify the relationship between the personality traits and the SSI dimensions. Subsequently, generalized linear mediation model analyses were performed to verify the influence of personality as a mediator of SSI outcomes.

All statistical analyses were performed using the Jamovi Statistics software [18]. The significance level was set at $p < .05$.

Results

Sample characteristics

Descriptive statistics were used to analyse the demographic data of the sample, partial correlational analyses were computed to preliminarily explore the relationships amongst all variables, and the dataset was screened to detect missing data and outliers. No missing data were found.

Of the eligible participants ($N = 333$) based on the inclusion criteria, 127 of them (38.1%) were evaluated for their soft skills ($N = 77$ or 60.6% were female; mean age = 21.8 years; SD = 2.38; age range = 18–29 years). Figure 3 illustrates the distribution of participants in the soft skill measurement by year level in medical school.

The adherence to soft skills evaluation showed the strong need of the young to understand themselves and know how to improve their personal growth during academic study. Interestingly, a high percentage of third-year medical students sought soft skill measurement, and this percentage dropped noticeably in the sixth year. In particular, the increased exposure to clinical practice seemed to emphasize the relevance of personal growth in integrated academic learning towards enhanced professional achievement.

Psychological and individual testing data

Subsequently, we processed the psychological and individual testing data. The raw scores of the participants in

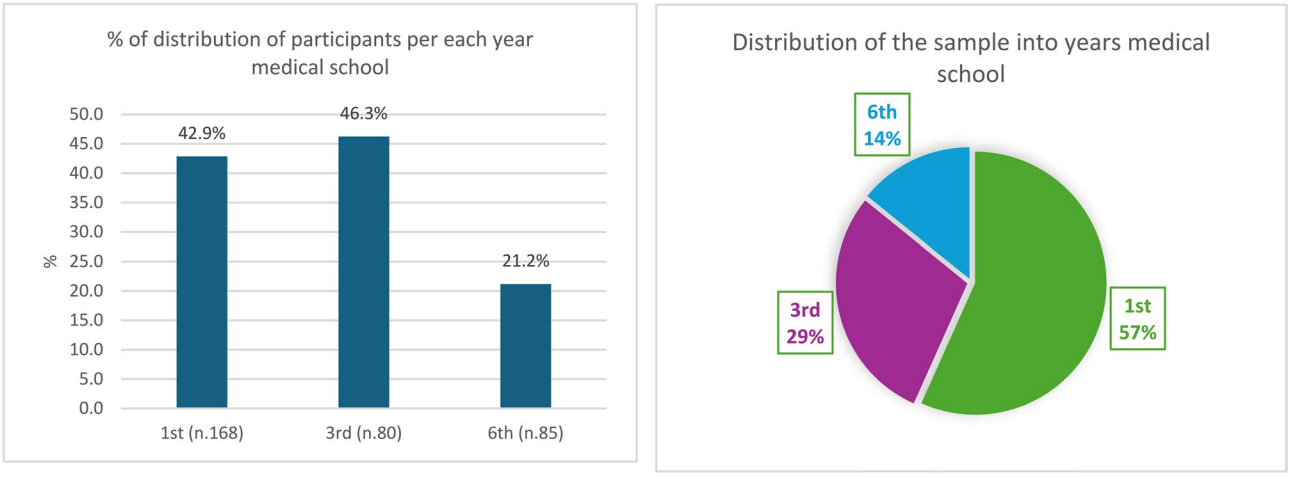

Fig. 3 Percentage of participation in soft skill measurement by year level in medical school

the BFI-10 and SSI tests are shown in Table 1 (see Supplementary Materials).

The data were evaluated using the Shapiro–Wilk Test, which showed that not all variables were normally distributed, similar to the medical school year distribution reported in Table 2 (see Supplementary Materials). Table 2 shows the descriptive statistics of the participants for the BFI-10 and SSI indexes by year level in medical school (first, third, and sixth).

Pearson's correlation test was then performed to analyze the relationship between the BFI-10 and SSI indexes (Table 3 in Supplementary Materials). The comparison showed that the conscientiousness and extroversion dimensions correlated positively with all SSI indexes (self-determination: $p = .001$; resilience: $p = .001$; empathy: $p = .001$; assertiveness: $p = .001$; social support: $p = .004$; teamwork: $p = .001$); apart from empathy, which showed no significance, even extroversion was positively correlated (self-determination: $p = .003$; resilience: $p = .001$; assertiveness: $p = .002$; social support: $p = .02$; teamwork: $p = .04$). Meanwhile, openness correlated positively with empathy.

Finally, a generalized linear mediation model analysis was performed to determine the predictive effect of the year level in medical school on the SSI indexes (self-determination, resilience, empathy, assertiveness, social Support, teamwork) through agreeableness, conscientiousness, openness, emotional stability, and extroversion. Mediation statistical analyses showed significant direct and indirect effects of the factors (year level in medical school) and mediators (conscientiousness/extroversion and openness) on the dependent variables (SSI indexes). The results suggested that the direct and indirect effects play an important role in changing the odds of the SSI indexes owing to specific personality traits. Figure 4 illustrates the graphical prediction models. Conscientiousness was a predictive factor for all soft skills examined: self-determination ($\beta = 0.54$, SE = 0.26, 95% CI [1.44; 2.46], $t = 7.57$, $p < .001$), resilience ($\beta = 0.48$, SE = 0.27, 95% CI [1.18; 2.26], $t = 6.33$, $p < .001$), empathy ($\beta = 0.36$, SE = 0.19, 95% CI [0.39; 1.13], $t = 4.09$, $p < .001$), assertiveness ($\beta = 0.24$, SE = 0.27, 95% CI [0.22; 1.28], $t = 2.80$, $p < .006$), social support ($\beta = 0.18$, SE = 0.31, 95% CI [0.03; 1.26], $t = 2.07$, $p < .04$), and teamwork ($\beta = 0.30$, SE = 0.27, 95% CI [0.38; 1.44], $t = 3.39$, $p < .001$). As for the extroversion trait, it significantly predicted resilience ($\beta = 0.23$, SE = 0.22, 95% CI [0.25; 1.13], $t = 3.10$, $p < .002$), assertiveness ($\beta = 0.24$, SE = 0.22, 95% CI [0.21; 1.07], $t = 2.93$, $p < .004$), and social support ($\beta = 0.17$, SE = 0.25, 95% CI [0.01; 1.02], $t = 2.02$, $p < .04$). Openness was correlated with (Table 2 in Supplementary materials) and predictive for empathy ($\beta = 0.19$, SE = 0.16, 95% CI [0.04; 0.67], $t = 2.24$, $p < .02$).

The direct effect of early medical school years (third year vs. first year) on the SSI indexes was significant for self-determination ($\beta = -0.18$, SE = 0.96 [95% CI, −4.23, −0.41]; $t = -2.41$; $p < .01$) and resilience ($\beta = -0.16$, SE = 1.02 [95% CI, −4.10, −0.08]; $t = -2.05$; $p < .04$). The direct effect of late medical school years (sixty yearth vs. first year) was significant for self-determination ($\beta = -0.36$, SE = 1.24 [95% CI, −8.57, −3.67]; $t = -4.95$; $p < .01$) and resilience ($\beta = -0.16$, SE = 1.30 [95% CI, −5.25, −0.10]; $t = -2.05$; $p < .04$). Figure 5 shows the differences in self-determination and resilience by mean values.

Discussion

This study aimed to navigate the soft skills of Gen Z medical undergraduates to identify their strengths and weaknesses in their professional development. The findings are interesting and merit an in-depth view. With regard to the soft skill measurement, the medical undergraduates showed the increased interest as they began to interact with patients during clinical training. Hence, third-year undergraduates showed stronger interest in

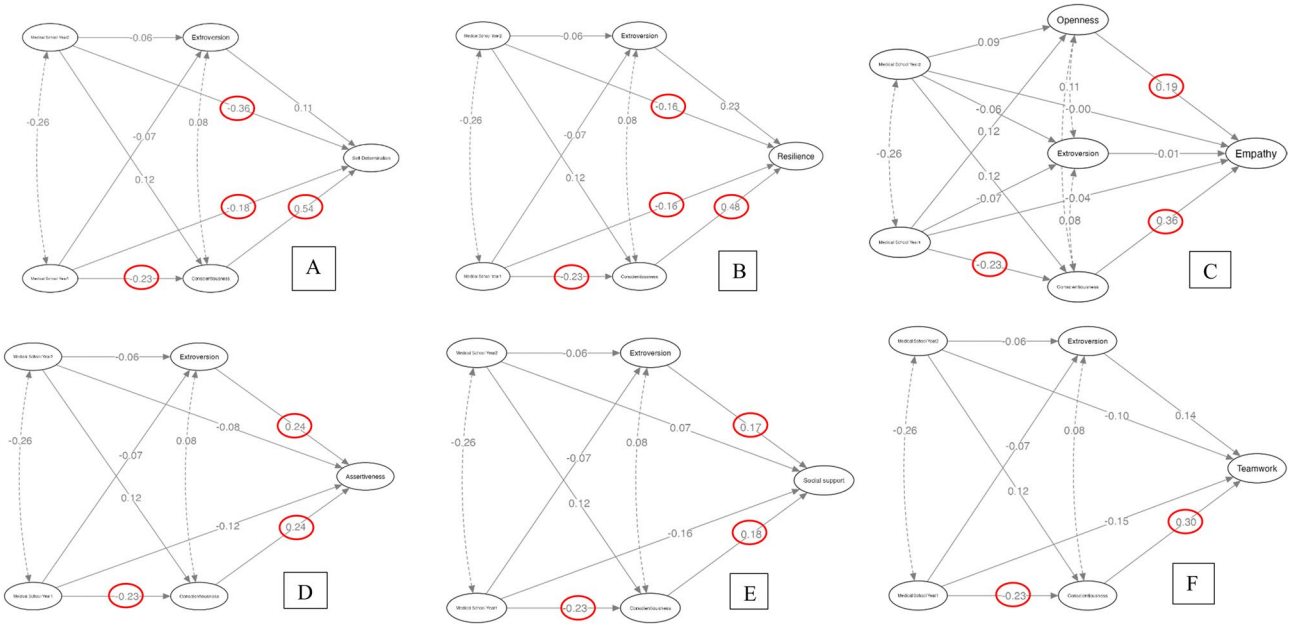

Fig. 4 Mediation diagrams for each examined SSI index by beta values

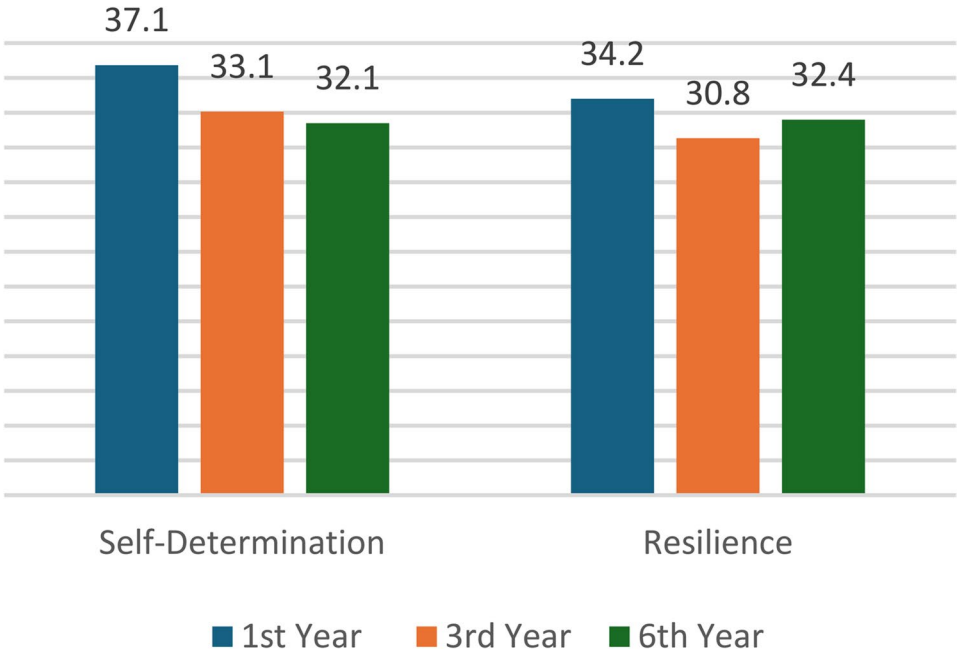

Fig. 5 Graphical representation of performance (mean values) in self-determination and resilience indexes

their personal growth. The result is attributable to their initial practical experience (tutoring and daily interactions with patients in medical training) and the emerging need to adhere to the demands of professional growth. For the sixth-year medical undergraduates, their interest in empowering themselves remained noticeable, although the percentage was smaller.

As a side effect, the risk of dropping from the program towards the end of medical education could be associated with undergraduates' increased focus on gaining hard skills rather than soft skills, thereby neglecting personal involvement in practical training. As suggested by Hojat et al. [19] and Barbaranelli et al. [20], the risk of erosion of one's personal growth in medical education could be a realistic perspective because students tend to favor evidence-based knowledge; building advanced knowledge in medicine is demanding and requires enormous efforts for undergraduates, and the same could be more relevant

for physicians in training who must deal with not only their patients and their symptoms/diseases but also their daily life and real-life needs. Through the ripple effect, hard skills could be prioritized for improved patient care, thereby overshadowing the value of interpersonal engagement in patient care, that is, 'the art of the patient care', and neglecting medical professional values.

In our view, tutoring in clinical teaching should be better tailored and enhanced in medical education to empower Gen Z towards a multilayered construct of medical competence, as highlighted by Ten Cate et al. [21]: the gradual and balanced relevance of canonical, contextual, and personalized competence in the progressive professional development continuum towards a holistic approach to care. The model of the multilayered construct of medical competence represents a fruitful framework in which the personal dimensions are relevant for health professional development given that physicians in training deal with 'challenging and exegeting' opposite learning pathways.

The key point of our study was the analysis of the relationship between the personality traits and behavioral dimensions of medical professionals and the networking amongst them. Our findings primarily highlighted the relevance of personality traits (conscientiousness, extroversion, and openness) in the personal growth of medical undergraduates and their predictive effect on the development of transversal competence (soft skills) in medical education. The undergraduates seemed to be negatively influenced in the middle of their own medical course (third year), reflecting the impact of clinical teaching and complex patient care engagement. Overcoming the impasse means improving the self-perception of one's own personal growth. Conscientiousness is a key trait to empower Gen Z physicians in training as it translates into persistence and determination in achieving personal goals and learning processes. As highlighted above, clinical teaching is a stressor for medical undergraduates, who feel that they have reduced personal abilities (soft skills). Moreover, experiencing complex practice in medicine could be a challenge for undergraduates who were previously focused on hard skills [19]. The transversal competencies of self-determination and resilience appear to reduce over time. This finding is relevant to Gen Z as it could empower them as they seek personal growth linked to advanced medical knowledge. Using the lens of SDT, medical undergraduates need to be engaged and buffered against the stressors of patient care. As Neufield and Babenko [22] emphasized, "In self-determination theory, relatedness is our human need not to "fit in" per se (since this often requires us to sacrifice or betray part of who we are to gain approval and social status), but rather to feel genuinely connected to and valued by others. Autonomy is our need for volition versus feeling controlled. The problem is that the culture in medicine does not support individuality and self-determination" [22] (pag. 10).

Medical leaders and clinical trainers should address structural and cultural factors to model the learning processes in medical education, link performance to the psychological needs of young people, avoid the dissonance between autonomy and competence, and favour a buffering effect for feelings of inauthenticity, self-esteem fragility, stress, and burnout. The ongoing transformation of the Italian medical curriculum is focused on improving the integrated learning of system-based approaches aimed at incorporating more case-based learning that focuses on common or relevant chronic diseases. It also focuses on professionalism, professional identity building, inter-professional learning, and the development of clinical skills using early patient contact combined with simulation. From an academic perspective, a more student-centered approach must be integrated into carefully tailored mentoring/tutoring programmes.

Limitations

This study has several limitations that should be considered when the results are interpreted. Fisrt, the study design adopted: cross-sectional design favoured the psychological investigation comparing groups analizing data from a population at a single point in time; the use of a pre- and post test design would provide more insight into individual progress and knowledge retention over time. The limited sample size could affect the results of the study by reduced statistical power, making it harder to detect true effects and increasing the risk of false negatives, as well as decreased generalizability of findings. More, self-report bias could mislead descriptive statistics and causal inferences. Finally the lack of longitudinal data: data collected over time on the same individuals or subjects to study changes, trends, or patterns as they evolve could make robust finding.

Implications and future directions

The relevant outcome of the study was to draw the strengthens and weakness of medical curriculum taking care the learning features for Gen Z education. The need to enhance the medical school programme fostering the medicine education engaging youth into helix process toward to the powering the personal growth, developing of autonomy and thrusting the self-determination. The interaction of medical leaders, trainers and medical undergraduates should model the professional learning tailoring the escalated clinical skills building advanced knowledge in medicine.

Future research could address the unequal distribution of participant types across groups and increase the response rate to minimize selection bias. Furthermore, pre- and posttesting with follow-up assessments should

be employed to measure learning gains accurately, and controlled designs should be used to isolate instructional dynamics (e.g., interactivity and pacing) from the delivery mode, thereby enhancing generalizability and internal validity. In future research, a more diverse spectrum of synchronous and asynchronous learning formats should be assessed (e.g., online learning incorporating gamification elements).

Abbreviations

HPE	Healthcare professions education (HPE)
Gen Z	Generation Z
SDT	Self-Determination Theory
BFI-10	Big Five Inventory-10
SSI	Soft Skills Inventory
CI	Confidence Interval
SD	Standard deviations

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12909-025-07939-5.

Supplementary Material 1. Table 1 – Raw scores of participants, Shapiro–Wilks test and percentiles. Table 2 – Raw scores of participants distributed by year level in medical school. Table 3 – Preliminary partial correlation analysis (Pearson's test).

Authors' contributions

DDG and SR conceptualization; DDG data analysis; SB, conceptualization and investigation; GF, interpretation and supervision; SR supervision. All Authors contributed to write the paper.

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

Ethical approval to conduct this study was granted by the Institutional Review Board of the University of L'Aquila, Italy (ID 44/2022). Informed consent was obtained from each participant, and the study adhered to the guidelines outlined in the Declaration of Helsinki [23].

Competing interests

The authors declare no competing interests.

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