

Relationship between Resilience and the Impostor Phenomenon among Undergraduate Medical Students

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ABSTRACT

INTRODUCTION: Impostor Phenomenon (IP) is the inability to internalize success and a tendency to attribute success to external causes. Social and institutional support are strategies to avoid the problem, but only partially successful. Resilience has been considered protective against mental health disorders in medical students. This study aims to investigate the association between IP and resilience in undergraduate medical students.

METHODS: Using Clance Impostor Phenomenon Scale (CIPS), Connor-Davidson Resilience Scale (CD-RISC), and a socio-demographic questionnaire, we conducted a cross-sectional, quantitative study with undergraduate medical students.

RESULTS: The study included 425 pre-clerkship medical students of average age of 23.03 years. The prevalence of IP was 47.76% (CIPS \geq 62 score, as recommended in prior literature.) and there were no differences among age, gender, current semester, religion. The majority student's CD-RISC score was 68.57 ± 14.66 and there was no statistical difference in resilience scale among age, gender, religion and training semester. "Other religions" group was associated with a higher resilience score when compared to "Catholic" or "Non-religious" students. We found an inverse correlation between the level of resilience by CD-RISC and the level of symptoms related to IP by CIPS ($\rho = -0.409$; p -value $< .001$).

CONCLUSIONS: Findings from this study suggest that higher levels of resilience are likely protective against IP among undergraduate medical students. Furthermore, the non-inclusion of medical internship students and the cross-sectional design of this study are restraining aspects noticed within the project, suggesting the need for further studies to adjust those limitations.

KEYWORDS: Impostor phenomenon, resilience, psychological, education, medical

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Introduction

Impostor Phenomenon (IP) was first described in 1978 by Dr Pauline R. Clance, being characterized as an inability to internalize success or a tendency to attribute it to external causes as sympathy, charm, appearance.¹ Social and institutional support can only help partially in managing IP which can result in chronic feelings of insecurity and fear of being discovered as an intellectual fraud.²

Although IP has been well described in other fields, there is a relatively limited understanding of this phenomenon.^{3,4} This is especially problematic due to the high expectations and rates of perfectionism while dealing with an individual's health and well-being, which place individuals within medical occupations at high chances of developing anxiety and/or depression and the suicide risk.¹

It is said IP has potential implications for medical education. In a classroom environment, those who suffer from IP are less likely to speak or take part in discussions voluntarily, a

phenomenon that can be seen and affect the learning process. In addition, a high prevalence of IP may imply the need of curriculum adaptation, adjustments in assessment methods and an increase in faculty development.²

According to the study by Hutchins and Rainbolt,⁵ which analyzed the mechanisms of coping with IP among medical students, success validation, positive affirmation, social and institutional support were effective strategies to mitigate the symptoms of this phenomenon. However, coping strategies aiming to avoid the problem were only partially successful.⁵

According to Rosenthal and Schlüssel⁶ who analyzed the construct among IP prevalence, the students' welfare level and their interpersonal relationships quality, they found out some individuals who presented high levels of IP, also presented the lowest scores in self compassion and sociability with their peers. In opposition, they have got the highest scores in anxiety and loneliness. The authors also found the



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highest levels of IP in the female gender, increasing throughout their academic year.

Student-centered strategies such as maintaining a record of successes and positive feedback, celebrating achievements and seeking mentors and financial support have been proposed in the literature for managing IP.⁷ As well as institutional adaptations such as the holding of workshops about IP, the development of educational guidance and the promotion of a culture of non-punishment for errors were proposed by other authors in order to minimize the impact of IP in medical students.⁸ Using *resilience*, which is the ability to cope with stress and thrive when faced with adversity, against mental health disorders, such as *burnout* and *depression* in medical students has been considered a protective solution against IP.⁹ Regardless, we wonder, is *resilience* an effective remedial measure or a real solution?

We assume that an association between resilience levels and IP levels is a relevant matter for discussion and investigation, considering that resilience may be seized or changed depending on personal and social factors. Hence, they can help build a mature mindset to deal with mistakes as opportunities to learn reducing IP levels. As a result, it improves the students' quality of life. Therefore, this study aims to investigate this inverse relation between IP levels and resilience levels.

Methods

We surveyed students from the medical course in the Christus University Center in Fortaleza, Brazil where this study was conducted. The medical course is divided into four years of preclinical and clinical content and two years of internship. We recruited participants at the university center, from preclinical to pre-internship semesters (from 1th to eighth) of the course. We excluded students who did not give consent for the study. The Ethics and Research Committee of the institution CAAE: 10294519.4.0000.5049 approved this study being in compliance with Resolution 466/12 of the National Health Council and the Helsinki Declaration. Subjects' participation was voluntary. Participants signed a Informed Consent Form to assure confidentiality and were not identified to ensure the secrecy and truthfulness of the survey's data.

Measures

Socio demographic questionnaire. This essay's authors formulated the variables shown on Table 1 to assess the socio demographic status of the participants conducted in the survey. It includes questions about age, gender, training semester and religion.

Clance Impostor Phenomenon Scale (CIPS). The Clance Impostor Phenomenon Scale (CIPS) questionnaire was used to detect indicators of IP.¹⁰ The questionnaire consists of 20 questions that aim to identify: (1) fear of assessment, (2) fear of not being able to repeat success and (3) fear of being less

capable than others. The scale uses a 5-point Likert-type ranging from 1 to 5 (where 1 = not at all true and 5 = very true). The result score ranged from 20 to 100 (where 20-40 = mild, 40-60 = moderate, 60-80 = severe, and >80 = intense) to identify the level of symptoms related to IP. We also used the cut-off point total score ($\leq 62/100$) to identify IP.¹¹

Connor-Davidson Resilience Scale (CD-RISC). The level of resilience was evaluated using the Connor-Davidson Resilience Scale (CD-RISC),¹² which has 25 items and measures the level of an individual's trait resilience. For the purposes of this present study, we adapted and used the version that has been validated in the Portuguese language.¹³ The instrument consists of 25 questions whose answers fit on a 5-point Likert-type scale ranging from 1 to 5 (where 1 = 0 and 5 = 100).

Analysis

We analyzed the data using the Statistical Package for Social Sciences (SPSS) Chicago, IL version 20. We summarized the data using descriptive statistics such as proportion, frequency and students' mean. The Fisher's exact test or the Pearson's chi-square test was used to apply associations and relationships between the categorical variables. The Mann-Whitney test or the Friedman/Dunn test was also used to apply associations between the continuous variables. We analyzed the relation among *resilience* and the level of symptoms related to IP using the Spearman correlation coefficient. A p -value $\leq .05$ was considered statistically as significant.

Results

At the end of this study, 425 students, at an average age of 23.03 ± 5.0 years, represent 62.1% of the total of 684 preclinical to pre-internship undergraduate medical students. Based on the CIPS criteria (see Measures), the prevalence of IP was 47.76% (CIPS ≤ 62 score). Using the Statistical Package for Social Sciences (SPSS) we found that there were no statistical differences regardless of age (p -value = .327), gender (p -value = .605), training semester (p -value = .274) and religion (p -value = .104) in relation with IP.

Based on the CD-RISC criteria (see Measures), medical students' mean resilience score was 68.57 (SD = ± 14.66). We found that there were no statistical differences in resilience scale among age (p -value = .413), gender (p -value = .186) and training semester (p -value = .836). "Other religions" group was associated with a higher resilience score when compared to "Catholic" or "Non-religious" group students (p -value $< .001$) (Table 1).

We found an inverse correlation between the level of resilience by CD-RISC and the symptoms' level related to IP by CIPS ($\rho = -0.409$; p -value $< .001$) (Figure 1).

Table 1. Demographic data from undergraduate medical and evaluation of impostor phenomenon and resilience ($n = 425$).

	TOTAL	CLANCE IMPOSTOR PHENOMENON SCALE (SCORE)		P-VALUE*	CONNOR-DAVIDSON RESILIENCE SCALE	P-VALUE**
		<62	≥ 62			
<i>Age (years)</i>						
<21	203 (47.8)	101 (45.5)	102 (50.2)	.327	64.45 ± 9.63	.413
22 or more	222 (52.2)	121 (54.5)	101 (49.8)		65.76 ± 9.49	
<i>Gender</i>						
Female	154 (36.2)	83 (37.4)	71 (35.0)	.605	66.08 ± 9.53	.186
Male	271 (63.8)	139 (62.6)	132 (65.0)		64.14 ± 9.58	
<i>Semester</i>						
First	67 (15.8)	35 (15.8)	32 (15.8)	.274	66.22 ± 9.58	.836
Second	45 (10.6)	16 (7.2)	29 (14.3)		66.73 ± 9.87	
Third	55 (12.9)	28 (12.6)	27 (13.3)		65.96 ± 9.73	
Fourth	53 (12.5)	32 (14.4)	21 (10.3)		65.08 ± 9.67	
Fifth	59 (13.9)	34 (15.3)	25 (12.3)		65.81 ± 9.60	
Sixth	27 (6.4)	12 (5.4)	15 (7.4)		60.65 ± 9.81	
Seventh	42 (9.9)	25 (11.3)	17 (8.4)		65.66 ± 9.92	
Eighth	77 (18.1)	40 (18.0)	37 (18.2)		64.74 ± 9.60	
<i>Religion</i>						
Without religion	40 (9.4)	15 (6.8)	25 (12.3)	.104	57.61 ± 9.83	<.001
Catholic	320 (75.3)	169 (76.1)	151 (74.4)		67.24 ± 9.48	
Others	65 (15.3)	38 (17.1)	27 (13.3)		70.46 ± 9.58**	

Note: *Fisher's exact test or Pearson's chi-square test, n (%); **Mann-Whitney test or Friedman/Dunn test (mean ± SD); p -value < .05. Source: elaborated by the authors.

Discussion

In this study, an average prevalence of IP was identified in most medical students, regardless of the age, gender, training semester and religion. Besides this, we found an inverse correlation between *resilience* and IP prevalence. Along with that, the concept of resilience and its development has been included to therapeutic approaches to mental illness.^{14,15}

Higher levels of *resilience* have been associated with better subjective well-being in medical and nursing students in Finland.¹⁶ Another study in Australia identified that *resilience* was associated with lower levels of distress in medical and psychology students.¹⁷ In China, *resilience* was associated with moderating negative life events in medical students.¹⁸ Other Chinese study also found that *resilience*, *hope* and *optimism* were all negatively correlated to depressive symptoms.¹⁹ In a study with Brazilian medical students, *resilience* was associated with higher quality of life scores and more positive perception of the educational environment.²⁰ In a study with medical

students in the United States, residents and doctors at the beginning of their careers, *resilience* was identified as a protector against burnout, less likely to experience other dimensions of suffering and protect individuals from other stress factors.²¹

Conclusion

This study aimed and identified an association between resilience and IP among medical students. Further studies are necessary to identify opportunities for interventions to increase resilience and evaluate it against IP.

Our findings are consistent with the association between resilience and IP identified in the present study, corroborating the hypothesis that resilient behaviors can be beneficial and protective against this phenomenon.

In another recent study conducted with undergraduate medical students who underwent USMLE Step 1, the authors did not identify a linear association between *performance* and IP. These authors suggested that studies to assess resilience

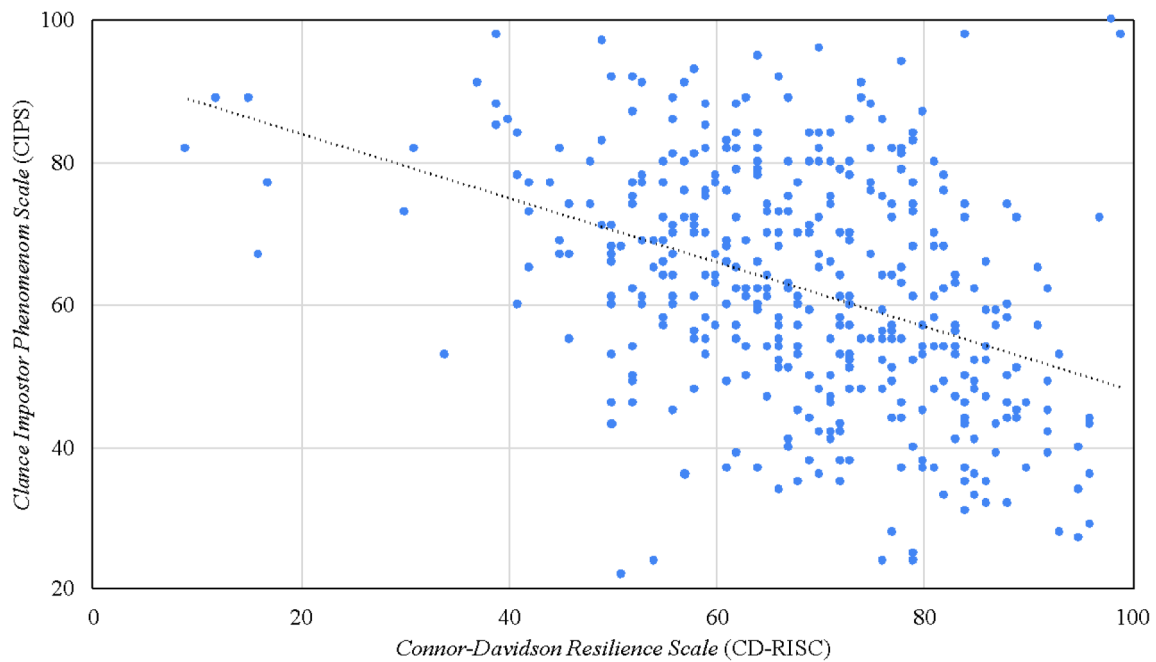


Figure 1. Correlation between impostor phenomenon and resilience among undergraduate medical students ($n = 425$). Note: Spearman correlation ($\rho = -0.409$; p -value $< .001$). Source: elaborated by the authors.

and other personal characteristics would be interesting to identify and measure the impact of IP on students' performance.²²

Another finding we thought relevant here is the two main limitation aspects to foster this study: the non-inclusion of medical internship students, who are likely to suffer from greater mental and physical demands; and the cross-sectional design of the study, which does not allow to determine a previous protection of resilience to IP. In addition to that, the generalization of the findings should be cautious, as the study was only conducted in a single university center. Future studies can adjust these limitations as well as find and solve more limitation aspects.

Despite these limitations, this study was important because it showed a relevant association between resilience and IP in undergraduate medical students. In addition, there is currently a lack of data in the literature on this affection in undergraduate medical students, which limits knowledge about prevalence and the impact on mental health on them, further research must be conducted to gather new data.

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Author Contributions

G.F.C: Conceptualization, Investigation, Data curation, Formal analysis, Writing—review & editing. I.F.S.C: Conceptualization, Investigation, Writing—original draft. A.G.C: Conceptualization, Investigation, Writing—original draft. L.D.M.P: Data curation, Formal analysis, Writing—

review & editing. P.G.B.S: Conceptualization, Formal analysis, Writing—review & editing. R.A.C.P: Conceptualization, Formal analysis, Writing—review & editing. K.L.A: Conceptualization, Methodology, Supervision, Formal analysis, Writing—review & editing. A.A.P.J: Conceptualization, Methodology, Supervision, Formal analysis, Writing—review & editing. All authors have read and approved the manuscript for publication.

Ethical Approval

Approved on Instituto para o Desenvolvimento da Educação Ltda-IPADE/ Faculdade Christus Ethics Committee, number: 3.319.224 CAAE: 10294519.4.000.5049. All study participants signed an informed consent form.

Informed Consent

Not applicable, because this article does not contain any studies with human or animal subjects.

Trial Registration

Not applicable, because this article does not contain any clinical trials.

Consent for Publication

Not Applicable.

Availability of Data and Materials

The authors declare that data supporting the findings of this study are available within the article and its supplementary information files according to journal request. The journal

can contact the corresponding author Arnaldo Aires Peixoto Junior to request the data if necessary.

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Abbreviations

IP	Impostor Phenomenon
CIPS	Clance Impostor Phenomenon Scale
CD-RISC	Connor-Davidson Resilience Scale
SPSS	Statistical Package for Social Sciences