




Unleashing Entrepreneurial Potential in Healthcare: Exploring the Mediating Role of Entrepreneurial Self-Efficacy in the Relationship between Positive Psychological Capital, Perceived Desirability, and Feasibility

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ARTICLE INFO

Article History:

Received: July 20, 2024

Revised: November 04, 2024

Accepted: November 05, 2024

Available Online: November 06, 2024

Keywords:

Entrepreneurial Intent

Medipreneurship

Positive Psychological Capital

Perceived Desirability

Perceived Feasibility

Theory of Planned Behavior

Entrepreneurial Event Model

Health Sciences Undergraduates

Funding:

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

Medical education is paying more emphasis to entrepreneurial intention, or the desire to start a business. This study aims to bring the entrepreneurial potential in healthcare, to the forefront. Therefore, this study intends to envisage the entrepreneurial intent by investigating the impact of positive psychological capital, perceived desirability and feasibility among health sciences undergraduates. The mediating role of self-efficacy (a part of perceived feasibility) is correspondingly examined. In this explanatory study, the data was gathered from a sample of 278 health science' undergraduates through survey questionnaire. SPSS-28 and AMOS-28 were used to analyze the collected data. By employing the SEM technique, it is found that positive psychological capital, perceived desirability (personal attraction towards entrepreneurship, perceived social norms) and perceived feasibility (perceived behavioral control) have a substantial and encouraging influence on entrepreneurial intent. Likewise, self-efficacy (a part of perceived feasibility) acts as a mediation between the predictors and the outcome variable. It is concluded that health sciences undergraduates' positive psychological capital, perceived desirability and feasibility momentarily encourage their entrepreneurial intention. The study results help attaining the socioeconomic intensification by readdressing the health sciences undergraduates' EI. The results also instigate the healthcare sector's policymakers to formulate policies for endorsing training to uplift self-development and EI among health sciences undergraduates.

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1. Introduction

Healthcare innovation relies on entrepreneurial medical students. They promote novel medical gadgets, digital health solutions, and technology via their entrepreneurial spirit. Medical students with entrepreneurial goals are more likely to create novel healthcare applications, wearable patient monitoring devices, or telemedicine platforms. Research and development initiatives by medical students increase medical knowledge and technology. Academic institutions, industry partners, and healthcare organizations must collaborate to apply scientific results. Entrepreneurs in biomedical engineering, biotechnology, and healthcare analytics tackle clinical issues, develop novel medications, and improve diagnostics. These improvements might improve patient care, healthcare delivery, and clinical results. Entrepreneurship has been considered as an economic engine and a crucial factor for job creation, innovation, and competition (Barba-Sánchez, Mitre-Aranda, & Brío-González, 2022). Medical students advocate for healthcare innovation and entrepreneurial legislation. They engage in healthcare policy discussions, regulatory reforms, and advocacy organizations to promote medical entrepreneurship. Their lobbying affects healthcare start-up and innovation ecosystem funding,

IP, and regulation. The contemporary research studies have shifted their focus from entrepreneurship to entrepreneurial intention/intent since entrepreneurial intention (EI) is the strongest predictor of entrepreneurial activities and behaviors which helps tertiary-level graduates, changing their mind-sets in from job seeking to job creation (Reuel Johnmark, Munene, & Balunywa, 2016). It is therefore, pertinent to investigate the contributing factors of students' EI to nurture their prospect entrepreneurialism. Based on different theoretical models of EI, there are diverse factors of EI among university students e.g., cognitive, psychological, contextual, educational, environmental and personality factors. However, little research has been conducted to understand which factor is the most significant factor of EI among university students (Maheshwari, Kha, & Arokiasamy, 2023).

Entrepreneurship has been studied to create new jobs, to reduce unemployment and creating a culture of innovation primarily in the disciplines of computer science and engineering whereas, entrepreneurs in the health science have healthcare professionals who know the challenge, preferences, and the gaps in their industry (healthcare). They can connect entrepreneurially to support and ease the contemporary health-oriented products, services, technologies and diverse healthcare solutions for personal revenue and communal impact. EI generates inventive ideas, discover growth prospects, take risks in uncertain situations and stepping forward in creating a new product/service for the society (Tan, Le, & Xuan, 2020). Healthcare is the foremost industrial field however, it has inadequate entrepreneurial inclination in developing economies where the principal cause of unemployment is lack of entrepreneurial education and training (W. E. Forum, 2020). In health science programs, only few universities offer entrepreneurship courses to the medical students for healthcare management and innovation. However, the healthcare sector especially medical informatics (MI) lags behind in nurturing an innovative culture and entrepreneurship. Since, the global economy is fluctuating over past few years; there is a need for medical efficiency among medical graduates. There is utmost need to hence develop and ensure the entrepreneurial intent among undergraduates. One of the crucial agenda of "American Medical Information Association (AMIA) 2015" was the health information innovation and entrepreneurship which has been considered a recent emerging entrepreneurial trend in MI field (Househ, 2015).

World Economic Forum (WEF) carried out a survey named "Future of Jobs Survey 2020" and found that the Fourth Industrial Revolution (4IR) and COVID pandemic have inhibited both developed and developing economies to renovate their operations at an accelerated pace. These trends shrunk the size of working population in every country because contemporary job roles have replaced the old jobs thus, creating a pressure on economies to ensure contemporary skills. The redundant job skills will likely be discarded by 2025, while emerging talents will occur in each industrial cluster and economy. WEF predicted that the human share in the health care industry will be only 48.5% by the end of 2024. It will be 60.5% in reasoning and decision-making, 66.2% in coordinating, developing, managing and advising, and 65.6% in communicating and interacting while, the rest of the share will be acquired by the machines (World Economic Forum, 2020). In healthcare sector, 10.6% average share of workers is at the risk of displacement, while the average skills instability among the workforce is 48.2%. The prospective perceived blockades to new technology adoption are: lack of flexibility of regulatory framework (47.4%), skill gaps (42.1%), inability to attract specialized talent (42.1%), shortage of investment capital (38.8%), lack of flexibility in hiring and firing (38.8%), skill gaps in leadership (31.6%), lack of interest among leadership (10.5%), and insufficient understanding of opportunities (5.3%) (World Economic Forum, 2020). For that reason, there is an unvarying need for up-skilling and reskilling, which necessitates the need for entrepreneurship. Entrepreneurship assists in upskilling of the existing job roles and reskilling for the contemporary job roles. Hence, there is a tremendous need to readdress individual Entrepreneurial Intent (EI) in every industrial cluster and economy. Consequently, there is a paramount call for EI among health sciences undergraduates and the healthcare professionals.

Students' entrepreneurial goals shape medical education and training. To develop entrepreneurial skills in future doctors, medical institutions are adding entrepreneurship courses. Hackathons, innovation challenges, and start-up incubators teach entrepreneurial medical students problem-solving, collaboration, and resource management. They also design new instructional tools, simulation technologies, and digital learning platforms to improve medical training and ongoing education (Babatunde, 2024). Medical students' entrepreneurial objectives

broaden non-clinical careers. Medical students may advise, administer, teach, or start businesses. Combining business and medical skills creates employment, economic growth, and healthcare delivery paradigm shifts (Kim et al., 2013). Entrepreneurial medical students value patient-centered treatment and new healthcare models. They attempt to improve healthcare quality, efficiency, and accessibility by creating patient-centric solutions and care pathways (Babatunde, 2024). Medical students' entrepreneurial ambition affects healthcare innovation, access, education, research, policy, career diversity, economic development, and job creation. Medical education must promote an entrepreneurial spirit to prepare future doctors to solve complicated healthcare problems and improve the business. Medical students' entrepreneurial purpose has far-reaching ramifications for healthcare delivery and education. Medical students innovate, collaborate, and make a difference in healthcare, patient care, and global health by adopting an entrepreneurial attitude. Medical students' entrepreneurial aim affects healthcare quality, ethics, crisis management, and policy advocacy. Students revolutionize healthcare systems and improve patient care and public health by adopting an entrepreneurial attitude and using their medical skills (Babatunde, 2024).

This research will be the value addition in literature by investigating the most significant factors affecting EI of healthcare undergraduates, by providing theoretical as well as practical contributions to the Higher Education Institutions (HEIs) of health sciences to encourage and support undergraduates toward their EI. It will also help policy makers to apprehend how they can contribute towards the development of entrepreneurial activities to ensure the economic intensification of the country. It is relatable to reveal that universities/HEIs can play an indispensable role in ensuring entrepreneurial culture among young students. This study therefore, aims to broaden the research on EI antecedents (cognitive and psychological) by presenting the structural model to predict entrepreneurial intent among health sciences undergraduates. It examines that how positive psychological capital, perceived desirability and feasibility are coupled with EI and whether entrepreneurial self-efficacy mediates their relationships or not. Following are the research objectives of this study:

- RO1: To investigate the impact of entrepreneurial self-efficacy on entrepreneurial intent.
- RO2: To examine the role of positive psychological capital, personal attraction towards entrepreneurship, perceived social norms, and perceived behavioural control in determining entrepreneurial intent.
- RO3: To invest examine the impact of positive psychological capital, personal attraction towards entrepreneurship, perceived social norms, and perceived behavioural control on the entrepreneurial self-efficacy.
- RO4: To investigate the mediating impact of entrepreneurial self-efficacy on the association of positive psychological capital and entrepreneurial intent.
- RO5: To investigate the mediating impact of entrepreneurial self-efficacy on the association of personal attraction towards entrepreneurship and entrepreneurial intent.
- RO6: To investigate the mediating impact of entrepreneurial self-efficacy on the association between perceived social norms and entrepreneurial intent.
- RO7: To investigate the mediating impact of entrepreneurial self-efficacy on the association of perceived behavioural control and entrepreneurial intent.

2. Theoretical Framework and Research Hypotheses

2.1. Role of Entrepreneurship Education in Healthcare Sector

Entrepreneurial intention is the desire of people, especially healthcare students, to pursue entrepreneurial activities and healthcare industry innovation and value creation. Entrepreneurial intent among healthcare students drives innovation, education, and practice. Students can alter healthcare delivery, patient care, and public health outcomes by cultivating entrepreneurial attitude and intention via education, support, and cooperation. Healthcare students' entrepreneurial ambition may boost innovation and meet unmet needs. Students may find innovation possibilities, solve healthcare problems creatively, and enhance healthcare delivery technology by developing an entrepreneurial mentality and skill set. Entrepreneurial students also create healthcare companies, digital health businesses, and social enterprises to improve patient care, accessibility, and clinical results (Reuel Johnmark, Munene, & Balunywa, 2016). For students to develop entrepreneurial purpose and prepare for the changing healthcare scenario, entrepreneurship education must be included into healthcare curriculum. Entrepreneurship classes, practical learning, and multidisciplinary cooperation provide students the knowledge, skills, and tools to turn their entrepreneurial ideas into reality. Entrepreneurial ambition gives

healthcare students several employment options outside clinical practice. Students may work as healthcare entrepreneurs, consultants, inventors, or executives in start-ups, venture capital companies, or healthcare management organizations. Entrepreneurial students also drive intrapreneurial healthcare projects that enhance processes, services, and organization. By embracing entrepreneurship, students may generate value, make a difference, and pursue satisfying healthcare careers (Babatunde, 2024).

Policymakers, educational institutions, and healthcare stakeholders must build supportive environments and policies to encourage entrepreneurship and innovation among healthcare students. Healthcare businesses and enterprises require capital, incubation, mentoring, and regulatory frameworks adapted to their needs. Academic, industrial, and government partnership promotes knowledge transfer, technological commercialization, and ecosystem development, encouraging healthcare entrepreneurship (Babatunde, 2024). Entrepreneurial intention, the drive to participate in entrepreneurial activities, is widely recognized in healthcare education as a key determinant in determining future innovation and practice. Given the ever-changing healthcare market, healthcare students are increasingly encouraged to have an entrepreneurial attitude. Innovative ideas and entrepreneurial leadership are needed to modernize healthcare systems and enhance results as they face increasing costs, increased patient populations, and technology changes. Healthcare students' entrepreneurial ambition includes identifying possibilities, taking measured risks, and pursuing enterprises to solve healthcare concerns and create value within the ecosystem. Personal attributes, educational experiences, and healthcare setting affect this intentionality. Understanding the causes and effects of entrepreneurial ambition in healthcare students is crucial to developing educational programmes, support systems, and policies that promote innovation and entrepreneurship (Babatunde, 2024).

Developing an entrepreneurial management model for healthcare institutions necessitates an entrepreneurship discussion and its significance to healthcare. Amani et al. (2024) recommended to investigate entrepreneurial intent among undergraduates of other specializations e.g., health sector. Entrepreneurship in healthcare institutions is related to the corporate entrepreneurship, particularly entrepreneurial actions in an organization by individuals (managers) for innovation (Sharma & Chrisman, 1999). The current study argues that entrepreneurship subsists in the healthcare sector. In past, entrepreneurship focused on inventive concepts. Managers create inventive approaches to perk up the managerial performance via entrepreneurial actions in the challenging healthcare settings. The management of invention uses entrepreneurial actions to address the challenges in the healthcare context. This mounting market competition is increasingly motivating the execution of entrepreneurial strategies in healthcare sectors. This literature review aims to investigate the determinants of entrepreneurial intention among healthcare students, including personal traits, educational experiences, and contextual factors. It also explores the implications of entrepreneurial intention for healthcare innovation, education, and practice. This study aims to improve knowledge of entrepreneurial ambition among healthcare students and guide healthcare industry entrepreneurship and innovation initiatives. This literature review seeks to help stakeholders encourage entrepreneurship and innovation in the next generation of healthcare executives and professionals by examining the factors and consequences of entrepreneurial ambition.

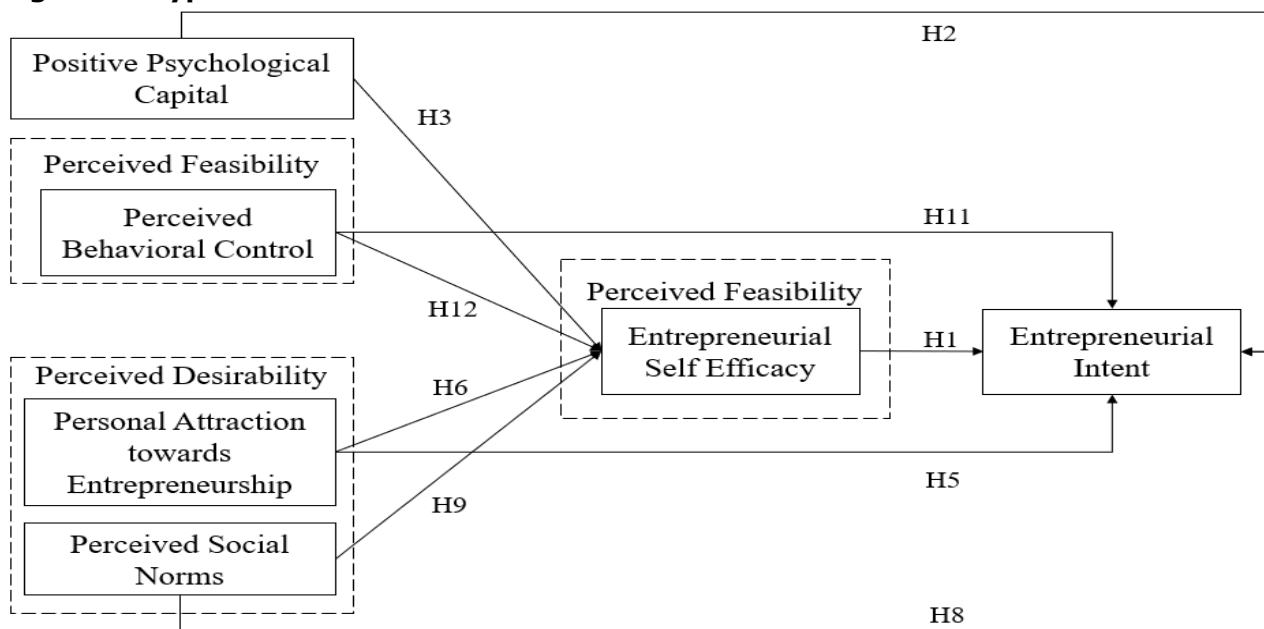
2.2. Integrating the Theory of Planned Behavior and Entrepreneurial Event Model

Entrepreneurship cannot be explicated by a single theory. The preceding literature have primarily focused on theory of planned behavior, therefore Maheshwari, Kha and Arokiasamy (2023) recommended to merge diverse models of entrepreneurial intention in future studies to extend the literature scope. This study therefore used the theoretical lens of Theory of Planned Behavior (TPB) (Ajzen, 1991), and Entrepreneurial Event Model (EEM) (Shapero, 1982) for the value addition in the literature. TPB suggests that positive psychological capital (Maslakçı, Sürücü, & Sesen, 2022) attitude toward behavior, subjective norms and perceived behavioral control predicts entrepreneurial intention (Liñán, 2008). TPB suggests that employees prefer socially suitable and practicable jobs in the career context. Both standpoints admit the momentous impact of self-efficacy on intention. It is supportive in nearly all intentional behaviors and provides great upshots in various fields (Ajzen, 1991). The Entrepreneurial Event Model (EEM) Shapero (1982) is one of the foremost extensively used models of entrepreneurial intention and behavior. It embraces "perceived desirability, perceived feasibility, and propensity to act to influence entrepreneurial intentions" (Shapero, 1982). This study embraces the first two

constructs. Perceived desirability refers to the aspiration, affect, or personal attraction/perception to instigate a new-fangled advantageous endeavour/venture (Krueger, Reilly, & Carsrud, 2000). Sarahiley (2020) found the influence of perceived desirability on EI. Krueger and Brazeal model emphasizes that perceived desirability tackles two significant constructs (attitude/attraction toward act and social norms) of TPB (Krueger & Brazeal, 1994). That's why, personal attraction towards entrepreneurship and perceived social norms are related to the perceived desirability. While, the perceived feasibility establishes confidence that it is viable to do so and to become an entrepreneur (Krueger, Reilly, & Carsrud, 2000). It is a person's viewpoint of future situations about entrepreneurship (Shapero, 1982). The perceived behavioral control is the feasibility to determine entrepreneurial intention (Peterman & Kennedy, 2003). The perceived behavioral control and entrepreneurial self-efficacy are related to the perceived feasibility of our study's model. The proposed model of current study is presented in the subsequent figure. In general, this model predicts that positive psychological capital, perceived desirability and feasibility are significantly coupled with the entrepreneurial intent among health science undergraduates. In addition, these relationships are expected to be more vigorous in the presence of entrepreneurial self-efficacy.

While TPB effectively predicts intention by addressing attitudes, norms, and perceived control, it has been critiqued for its limited focus on external factors, such as cultural and institutional influences, which might play a significant role in healthcare entrepreneurship. Similarly, EEM's emphasis on desirability and feasibility may overlook the complex interplay between professional identity and entrepreneurial intent in healthcare students. By integrating these models, this study aims to address these gaps while recognizing their theoretical boundaries. TPB and EEM may oversimplify the decision-making process, especially in healthcare contexts where professional motivations and ethical considerations might differ from general entrepreneurship. These models might not fully account for the unique challenges of healthcare students, such as clinical responsibilities or professional identity. While TPB and EEM provide robust frameworks for predicting entrepreneurial intentions, they may not fully capture context-specific nuances of healthcare students. For instance, the ethical considerations and clinical obligations inherent in healthcare professions may influence entrepreneurial decision-making, requiring potential adjustments to these models.

Figure 1: Hypothetical Research Model



The theoretical framework explicitly details how this study fills gaps in the literature. This study builds upon existing literature by focusing specifically on healthcare undergraduates, a demographic often overlooked in entrepreneurship research. Unlike previous studies that predominantly focus on business or engineering students, this research identifies the psychological and contextual factors unique to healthcare. By integrating TPB and EEM, the study provides a novel perspective on the antecedents of entrepreneurial intentions in the healthcare sector. This literature review examines how medical students' entrepreneurial purpose may affect

healthcare innovation, access, education, research, policy, career diversity, economic development, and job creation. Medical education's new idea of entrepreneurial ambition has far-reaching practical ramifications. This research review examines how medical students' entrepreneurial aim may affect healthcare delivery, patient outcomes, multidisciplinary teamwork, and global health efforts.

2.3. Entrepreneurial Self-Efficacy (Perceived Feasibility) and Entrepreneurial Intentions

Entrepreneurial Self-Efficacy (ESE) is a person's self-confidence in his/her skillfulness and abilities to execute scrupulous work despite of the challenges they confront while performing these tasks (Uysal et al., 2022). ESE is a job-related self-efficacy where employees have confidence in their capabilities to carry out entrepreneurship-related activities (McGee et al., 2009). Self-efficacy (or internal value) considerably envisages the upshots, e.g., motivation and intention for skill transfer (Shahzadi, Rafiq, & Ali, 2022; Shahzadi & Raja, 2021; Zia-ur-Rehman, 2014). It is considered as one of the significant predictors of actual work-related behaviors. Subsequently, a person having prominent ESE levels can have an elevated tendency to handle conquer diverse challenges. The relationship of ESE and EI has been increasingly got more attention by the contemporary researchers. Above and beyond, (Maheshwari, Kha, & Arokiasamy, 2023) and Liñán, Rodríguez-Cohard and Rueda-Cantuche (2011) found a significant and positive association of ESE and intentions to become entrepreneurs. Employees having elevated ESE heavily rely on their capability to be thriving, and attaining more optimistic outcomes. Therefore, we assume that:

H1: Entrepreneurial self-efficacy is strongly associated with entrepreneurial intent among health sciences undergraduates.

2.4. Positive Psychological Capital and Entrepreneurial Intentions

Researchers advocate that different psychological characteristic can be a possible reason for the different entrepreneurial intentions among university graduates. The psychological resources/capital augments students' EI (Mitchell et al., 2002). The Positive Psychological Capital (PPC) is considered as a positive way of thinking comprising positive psychological forces Shahzadi, Rafiq and Ali (2022) and has been considered a psychological resource in the progression of entrepreneurship (Baluku et al., 2019). This positive mind-set is indispensable for an entrepreneurial attitude that permits students to get knowledge from their experience and be familiarized with the business dynamics. Diverse aspects of PPC (for example; optimism, hope, and resilience) are crucial for entrepreneurial activities (e.g., recognition of innovation and opportunities) (Luthans & Youssef-Morgan, 2017). Psychological capital is an entrepreneurial cognitive speculation that will always assist in attaining the required output. Some researchers have spotlighted the association of PPC-EI and found that the individuals who practice entrepreneurship have an outstanding level of PPC. Maslakçı, Sürücü and Sesen (2022) showed that PPC is a considerable contributor of EI. Therefore, we predict that:

H2: Positive psychological capital is strongly associated with entrepreneurial intent among health sciences undergraduates.

Entrepreneurial Self-Efficacy (ESE) impacts the entrepreneurial outcome expectations (Santos & Liguori, 2019). People having elevated ESE level, develops a more optimistic outcome-expectations about their entrepreneurial activities and EI (Liguori et al., 2018). University students are more probable to cultivate strong intentions to commence business (e.g., launching products/services) when they possess positive expectation of their prospective entrepreneurial activities (Maheshwari, Kha, & Arokiasamy, 2023). Insert space Zhao et al. (2020) found that positive psychological capital (PPC) positively influences EI in presence of mediating variables. Entrepreneurial Self-Efficacy acts as an effectual mediator for university students' EI. Literature demonstrates that healthy/positive mindset and body state facilitate students to perk up their ESE (Chang et al., 2020) while, ESE and optimistic thoughts are positively related to EI (Maslakçı, Sürücü, & Sesen, 2022). Subsequently, the relationship between PPC and EI are manageable in presence of ESE as mediator. Hence, we propose the subsequent hypotheses to investigate the mediating effect:

H3: Positive psychological capital is strongly associated with entrepreneurial self-efficacy of health sciences undergraduates.

H4: Entrepreneurial self-efficacy mediates the association of positive psychological capital and entrepreneurial intent among health sciences undergraduates.

2.5. Personal Attraction towards Entrepreneurship (Perceived Desirability) and Entrepreneurial Intent

Personal attraction (attitude towards behavior) is the degree to which a person possesses an optimistic or pessimistic assessment about himself/herself to be an entrepreneur (Ajzen, 1991). It holds the affective considerations (e.g., I like, it's pleasant, it feels good) and the evaluative reflection (e.g., it is valuable and lucrative). If people have an exceedingly encouraging personal attraction towards entrepreneurship, their intention towards entrepreneurship will also be optimistic and encouraging (Liñán, Rodríguez-Cohard, & Rueda-Cantuche, 2011). There is need to explore the individual level factors that develop the entrepreneurial intention (Kumar & Shukla, 2022). Therefore, the following hypothesis has been devised:

H5: Personal attraction towards entrepreneurship is strongly associated with entrepreneurial intent among health sciences undergraduates.

Individuals having exposure to entrepreneurship, develop Entrepreneurial Self-Efficacy (ESE). Preceding literature advocates that entrepreneurial self-efficacy comprises personality dynamics that's why, work experience and exposure to entrepreneurs (Newman et al., 2019) may influence ESE. Nearly all preceding research reveals that entrepreneurial self-efficacy drives entrepreneurial intention (Chang et al., 2020). It is recommended to investigate the other mediating variables on the association of entrepreneurial intents and its determinants (Maheshwari, Kha, & Arokiasamy, 2023). Subsequently, we predict:

H6: Personal attraction towards entrepreneurship is strongly associated with entrepreneurial self-efficacy of health sciences undergraduates.

H7: Entrepreneurial self-efficacy mediates the association of personal attraction towards entrepreneurship and entrepreneurial intent among health sciences undergraduates.

2.6. Perceived Social Norms (Perceived Desirability) and Entrepreneurial Intent

The Perceived Social Norms (PSNs) put the social pressure on individuals to be or not to be engaged in entrepreneurial intentions and actions (Liñán, Rodríguez-Cohard, & Rueda-Cantuche, 2011). The perceived subjective norms and PSNs demonstrate students' judgment of how significantly their family, friends and other people assess or value their entrepreneurial activities. Their EI will progress if they have substantial social support (Chang et al., 2020). However, there is a little understanding of the predictors that influence students' EI (Fayolle & Gailly, 2008). This social capital ensures knowledge, enthusiasm, confidence, financial and communal support from friends, family, and other people (Lan & Luc, 2020). It will perk up students' intention to exercise entrepreneurship and intensify their motivation to be engaged in entrepreneurial activities. On the other hand, the social actors can put a negative social pressure if they are not encouraging towards carrying out particular behaviors (Asimakopoulos, Hernández, & Peña Miguel, 2019). Students are the prospect pioneers who are massively influenced by the communal assessments of their actual behaviors. However, Ajzen (1991) found a feeble relationship of subjective/social norms with intention. The academic environment persuades the entrepreneurial thoughts, permitting the undergraduates to change their thoughts on entrepreneurship (Thomas, Passaro, & Scandurra, 2014). Hence, Kumar and Shukla (2022) recommended to explore the environmental factors which influence the entrepreneurial intentions. Therefore, hypothesize the following relationship:

H8: Perceived social norms are strongly associated with entrepreneurial intent among health sciences undergraduates.

Nevertheless, social norms may influence the entrepreneurial self-efficacy as well. The preliminary research reveals that ESE mediates the association of entrepreneurial intents and their influencing factors (Maheshwari, Kha, & Arokiasamy, 2023). It means that perceived social norms can persuade individuals' perception of intentions. Consequently, we argue that the influence of perceived social norms on entrepreneurial intention can be enhanced if individuals

possess entrepreneurial self-efficacy since it is considered as the prevailing predictor of individuals' decision-making and a momentous factor in developing the intention toward entrepreneurial research (Maheshwari & Kha, 2022).. It leads us devising the following hypotheses:

H9: Perceived social norms are strongly associated with entrepreneurial self-efficacy of health sciences undergraduates.

H10: Entrepreneurial self-efficacy mediates the association of perceived social norms and entrepreneurial intent among health sciences undergraduates.

2.7. Perceived Behavioral Control (Perceived Feasibility) and Entrepreneurial Intent

Perceived Behavioral Control (PBC) is an individual's level of perceived control on his real performance and their predictable upshots (Armitage & Christian, 2003). PBC is considered as the judgement of lenience or complexity to accomplish the activities of interest (e.g., becoming an entrepreneur). The earlier literature authenticates that a person having superior level of behavioral control intensifies their intention and actual behavior (Autio et al., 2001). Subsequently, the perceived behavioural control reinforces the ability to predict a person's intentions. It has been suggested to investigate the personal factors which impact the entrepreneurial intention (Kumar & Shukla, 2022). Accordingly, we predict that:

H11: Perceived behavioral control is strongly associated with entrepreneurial intent among health sciences undergraduates.

The preceding studies reveals that entrepreneurial self-efficacy drives entrepreneurial intention and mediates the association of entrepreneurial intents and its contributing factors (Shahzadi, Ali, & Ejaz, 2023). Entrepreneurial self-efficacy encompasses the personality dynamics (McGee et al., 2009) hence, the perceived behavioral control may impact the entrepreneurial self-efficacy. Moreover, if individuals are acquainted with the future prerequisites of any project, it will perk up their ability to manage self-efficacy (Roxas, 2014). Therefore, hypothesize the following relationship:

H12: Perceived behavioral control is strongly associated with entrepreneurial self-efficacy of health sciences undergraduates.

H13: Entrepreneurial self-efficacy mediates the association of perceived behavioral control and entrepreneurial intent among health sciences undergraduates.

3. Methodology

3.1. Study Sample

Data was gathered by using both primary and secondary sources. Primary sources were the undergraduates from diverse health study programs (Nursing, Pharmacy, Psychology and Physical Therapy) and an adopted questionnaire was used to collect data. The sample comprised undergraduates from selected programs as these disciplines are most likely to encounter entrepreneurial opportunities in healthcare innovation. Moreover, the secondary sources were past published research articles, websites, and books. Questionnaires were distributed to 278 undergraduates who were selected from a population from of 1000 undergraduates. The confidence interval was 95% by applying simple random sampling technique. Simple random sampling was chosen for its fairness and ability to minimize selection bias, ensuring that every undergraduate had an equal chance of being selected. Demographic controls, including gender and age, were analyzed during data collection to ensure representativeness. This approach was intended to provide insights that are broadly applicable across healthcare education. The respondents were guaranteed that the data collected would be solely used for the research intention, and their confidentiality would also be ensured. Informed consent was obtained from all participants before data collection, ensuring that they were fully aware of the study's purpose and their rights. Data were anonymized by assigning unique participant codes, and only aggregate data were reported to maintain confidentiality.

3.2. Study Measures

A pre-tested and validated questionnaire named EIQ (Entrepreneurial Intent Questionnaire), was used to evaluate entrepreneurial intent among respondents (Liñán, 2008). EIQ and other scales used in this study were derived from previous validated instruments, including those tested in educational and healthcare contexts. Questionnaire was adapted by incorporating healthcare-specific examples, such as scenarios involving medical innovation and

patient care. A pre-test was conducted with 30 participants from the target population to assess clarity and contextual relevance. Based on feedback, minor adjustments were made to align the questionnaire with the healthcare context, enhancing its content and construct validity. Five-point Likert scale was used as the measurement scale. Five items of 'personal attraction', six items of 'Perceived behavioral control', and five items of 'Entrepreneurial intention' have been adopted from the previous studies (Liñán, 2008). Eight items of 'perceived social norms' have also been adopted from preceding studies (Sahban, 2015). Moreover, six items of entrepreneurial self-efficacy were adopted from the study of Krueger, Reilly and Carsrud (2000). Furthermore, ten items of positive psychological capital have been taken from the study of Luthans and Youssef-Morgan (2017).

4. Results

For data analysis, SPSS-28 and AMOS-28 software were used. The reliability analysis of each variable has been exhibited in table 1. It is pertinent to note that all Alpha values are above 0.60 and hence are considered reliable for further data analysis.

Table 1: Scale Reliabilities

Variable	No. of Items	Cronbach's Alpha
PPC	10	0.825
PAE	5	0.921
PSN	8	0.916
PBC	6	0.887
ESE	5	0.890
EI	6	0.926

After performing data reliability, descriptive statistics were also performed which includes mean, standard deviation, and correlation (Table 2). Correlation test was analyzed to investigate the strength and direction of the association between variables. The correlation value of all association's ranges from .67 to .95, which concludes that there is no multicollinearity and it also depicts that a positive and vigorous correlation exists among all variables.

Table 2: Descriptive Statistics

	Mean	SD	PPC	PAE	PSN	PBC	ESE	EI
PPC	3.071	1.627	1					
PAE	3.092	1.043	.715**	1				
PSN	3.313	.931	.854**	.918**	1			
PBC	2.927	1.126	.703**	.856**	.809**	1		
ESE	3.336	.956	.673**	.850**	.957**	.705**	1	
EI	3.0870	1.101	.823**	.942**	.873**	.827**	.808**	1

For hypotheses testing, Structural Equation Modeling (SEM) test was performed in AMOS-28. Model fit test was also investigated which shows that the measurement model exhibits a good fit since all the indices are well within the standard range.

Table 3: Structural Equation Model Fit Measures of Constructs

Constructs	GFI	IFI	CFI	NFI	AGFI	RMSEA
Index Value	0.940	0.913	0.922	0.943	0.950	0.041
Cut off Criteria	≥0.90	≥0.90	≥0.90	≥0.90	≥0.90	≤0.08

To accept or reject the proposed hypotheses, the path coefficient (β) and p-values were used. β values represent the relationship strength which must be close to +1 for a strong relationship. H1 states that ESE significantly affects EI ($\beta = .801, p < 0.000$) is accepted. The path coefficient of $\beta = 0.801$ between entrepreneurial self-efficacy and entrepreneurial intent indicates a strong positive relationship, suggesting that healthcare students with higher confidence in their entrepreneurial skills are significantly more likely to exhibit entrepreneurial intentions. Additionally, normality was assessed using skewness and kurtosis, confirming that the data met SEM requirements. H2 proposes that PPC extensively impacts EI ($\beta = .381, p < 0.000$) is accepted. The path coefficient of $\beta = 0.381$ between positive psychological capital and entrepreneurial intent indicates a positive relationship, suggesting that healthcare students having positive psychological capital are significantly more likely to exhibit entrepreneurial intentions. H3 proposes that PPC significantly impacts ESE ($\beta = .681, p < 0.000$) is accepted. The path coefficient of $\beta = 0.681$ between positive psychological capital and entrepreneurial self-efficacy indicates a

strong positive relationship, suggesting that healthcare students having positive psychological capital are significantly more likely to have the entrepreneurial self-efficacy. H4 proposes that PPC significantly impacts EI in presence of mediation of ESE ($\beta = .913$, $p < 0.000$) is accepted. It means there is a full mediation because the beta value has been increased from .381 to 0.913. The path coefficient of $\beta = 0.913$ indicates a strong positive relationship, suggesting that healthcare students having positive psychological capital are more likely to exhibit entrepreneurial skills, when they have more confidence in their entrepreneurial skills.

H5 presents that PAE strongly impacts EI, is also accepted ($\beta = .901$, $p < 0.000$). The path coefficient of $\beta = 0.901$ between perceived attraction towards entrepreneurship and entrepreneurial intent indicates a strong positive relationship, suggesting that healthcare students who perceive more attraction towards entrepreneurship are significantly more likely to exhibit entrepreneurial intentions. H6 proposes that PAE strongly influence ESE ($\beta = .720$, $p < 0.000$), is also accepted. The path coefficient of $\beta = 0.720$ between perceived attraction towards entrepreneurship and entrepreneurial self-efficacy indicates a strong positive association, suggesting that healthcare students who perceive more attraction towards entrepreneurship are significantly more confident in their entrepreneurial skills. H7 offers that ESE mediates the association of PAE and EI ($\beta = .914$, $p < 0.000$) is accepted. It means there is a full mediation because the beta value has been increased from .901 to .914. The path coefficient of $\beta = .914$ indicates a strong positive relationship, suggesting that healthcare students who perceive more attraction towards entrepreneurship have significantly higher entrepreneurial intentions, when they are more confident in their entrepreneurial skills.

Table 4: Results of Hypotheses Testing

Hypothesis	Estimate	P	Decision
H1: ESE→EI	.801	***	Accepted
H2: PPC→EI	.381	***	Accepted
H3: PPC→ ESE	.681	***	Accepted
H4: PPC→ES→EI	.913	***	Accepted (Full mediation)
H5: PAE→EI	.901	***	Accepted
H6: PAE→ESE	.720	***	Accepted
H7: PAE→ESE→ EI	.914	***	Accepted (Full mediation)
H8: PSN→EI	.827	***	Accepted
H9: PSN→ESE	.381	***	Accepted
H10: PSN→ESE →EI	.902	***	Accepted (Full mediation)
H11: PBC→EI	.349	***	Accepted
H12: PBC→ESE	.179	***	Accepted
H13: PBC→ESE→EI	.235	.025	Accepted (Partial mediation)

H8, proposes that PSN strongly affects EI ($\beta = .827$, $p < 0.000$), is accepted. The path coefficient of $\beta = 0.827$ between perceived social norms and entrepreneurial intent indicates a strong positive relationship. It suggests that healthcare students who have perceived social norms, are more likely to exhibit entrepreneurial intentions. H9, suggests that PSN strongly impacts ESE ($\beta = .381$, $p < 0.000$), is also accepted. The path coefficient of $\beta = 0.381$ between perceived social norms and entrepreneurial self-efficacy indicates a strong positive relationship. It suggests that healthcare students who have perceived social norms, possess higher confidence in their entrepreneurial skills. H10 presents that ESE mediates the association of PSN and EI ($\beta = .902$, $p < 0.000$) is accepted, which means there is a full mediation because the beta value has been improved from .827 to .902. The path coefficient of $\beta = .902$ indicates a strong positive relationship. It suggests that healthcare students who have perceived social norms exhibits significantly higher entrepreneurial intentions, when they are more confident in their entrepreneurial skills.

H11 proposes that PBC strongly impacts EI ($\beta = .349$, $p < 0.000$) is accepted. The path coefficient of $\beta = 0.349$ between perceived behavioral control and entrepreneurial intent indicates a strong positive relationship. It suggests that healthcare students who have perceived behavioral control are more likely to exhibit entrepreneurial intentions. H12 presents that PBC strongly affects ESE ($\beta = -.179$, $p < 0.000$) is also accepted. The path coefficient of $\beta = 0.179$ between perceived behavioral control and entrepreneurial self-efficacy indicates a strong positive

relationship. It suggests that healthcare students with higher confidence in their entrepreneurial skills are significantly more likely to exhibit entrepreneurial intentions. H13 offers that ESE mediates the association of PBC and EI ($\beta = .235$, $p=0.25$) is accepted, which means there is partial mediation because the beta value has been reduced from .349 to .235. The path coefficient of $\beta = 0.235$ between entrepreneurial self-efficacy and entrepreneurial intent indicates a strong positive relationship, suggesting that healthcare students who have perceived behavioral control are more likely to exhibit entrepreneurial intentions when they are more confident in their entrepreneurial skills.

5. Discussion

This study investigated the role of positive psychological capital, personal attraction towards entrepreneurship, perceived social norms and perceived behavioral control to predict entrepreneurial intent among health science' undergraduates. The findings of H1 shows that ESE strongly impacts EI, it means H1 is accepted; these findings are consistent with the previous literature Amani et al. (2024); Shahzadi, Rafiq and Ali (2022) Liñán, Nabi and Krueger (2013). The results of H2 show that PPC affects EI, which means H2 is accepted. These results are aligned with Maslakçı, Sürücü and Sesen (2022). While, the results of H3 shows that PPC affects ESE which means H3 is also accepted. These results are aligned with Maslakçı, Sürücü and Sesen (2022). The results of H4 depicts that ESE had a mediating impact on the association of PPC and EI. The findings of above three hypotheses are consistent with the findings of Maslakçı, Sürücü and Sesen (2022). Our study uniquely focuses on healthcare students, identifying entrepreneurial self-efficacy as a critical mediator. Unlike prior studies, which primarily targeted engineering and business students, this research highlights the distinct psychological and contextual factors in healthcare entrepreneurship.

H5 is also accepted, these results are aligned with the findings of Liñán, Nabi and Krueger (2013). In addition, health sciences undergraduates having optimistic entrepreneurial aspirations scored more in EI and ESE considerably differs from those having no optimistic goals. H6 is also accepted; these findings are aligned with Sahban (2015). Likewise, H7 is also accepted; these findings are partially consistent with the findings of Sahban (2015), who found individual inclination as the dominating antecedent in becoming an entrepreneur. Similarly, H8 is accepted too; these results are aligned with the preceding literature (Shook & Bratianu, 2010). These findings are also aligned with the findings of previous authors Shahzadi and Raja (2021) who found that culture (subjective norms) is considerably interlinked with intention. It depicts that health science undergraduates consider that if they start a new business, there will be less or no support (financial) from their social circle, e.g., family, friends and others. Majority of undergraduates criticize their circle's social support to become an entrepreneur. It can be hence forecasted that when the undergrads believe in their stress and pressure management while starting a new venture, they will have more inclination toward EI.

In addition, H9 is accepted; these results are consistent with the results of Walker et al. (2011), who found an indirect influence of PSN on SE. Additionally, H10 is also accepted; these results are aligned with the findings of Liñán, Rodríguez-Cohard and Rueda-Cantuche (2011), who found that PSN (perceived desirability) has an indirect impact on feasibility (self-efficacy) rather than a direct impact on EI. Likewise, H11 is also accepted; these results are aligned with Liñán, Rodríguez-Cohard and Rueda-Cantuche (2011), who found PBC the sturdiest predictor of EI. Equally, H12 is accepted; these findings are consistent with the previous literature (Liñán, Rodríguez-Cohard, & Rueda-Cantuche, 2011), which found that PBC significantly impacts the perceived feasibility. Last but not least, H13 is also accepted; these findings partially support the results of . This study is the value addition in the literature of positive psychological capital, entrepreneurial intent, perceived desirability, and perceived feasibility. This study is exceptional since it examined the psychological (positive psychological capital) and the cognitive (PSN, PAE, PBC, and ESE) factors and their impact on EI. It also adds into the literature by investigating the mediating role of ESE in predicting EI. Moreover, it also adds to the literature of TPB and EEM in the entrepreneurship education. The authors consider that the potential for entrepreneurship research is tremendous to understanding of entrepreneurial behaviour and actions since this area is persistently evolving.

5.1. Implications

The findings of this study have diverse implications for healthcare practitioners, policymakers, and other stakeholders. Healthcare practitioners can leverage business model

innovation to boost patient-centered care, optimize workflows, and progress operational efficiency. The policymakers can back-up entrepreneurship in healthcare by encouraging regulatory flexibility, endorsing reimbursement reform, and capitalizing in healthcare innovation ecosystems. Policymakers should launch “regulatory innovation sandboxes” or “innovation hubs” to ensure a conducive environment for “testing and scaling” the innovative healthcare solutions. It will allow healthcare start-ups to test ideas in a controlled environment. They should also encourage collaboration between academic institutions and healthcare industries (industry academia collaboration) to offer internships and co-op programs emphasizing entrepreneurship. All stakeholders must collaborate to address regulatory barriers, align compensation system, and uphold the culture of entrepreneurship. Policymakers can support entrepreneurship in healthcare by providing grants or seed funding programs for student-led start-ups and fostering incubators tailored to medipreneurship. Educational institutions could integrate entrepreneurship modules into health sciences curricula, emphasizing innovation in healthcare delivery and business management. For instance, problem-based learning activities could include designing business models for healthcare solutions.

The authors suggest that particular strategies of teaching must be adopted which intensify the advancement of entrepreneurial intention hence to choose entrepreneurship as a career choice in the health science undergraduates. Our study supports that teacher must guarantee more pragmatic experience for undergrads to engage in entrepreneurial activities, regardless of cultural or social constraints. Hence, the teachers who want to perk up undergrads’ ESE and EIs should believe guarantee added learning experiences where they can unwaveringly unite with the community. The policymakers of health/medical sector should develop policies to encourage entrepreneurship in the healthcare industry. To foster entrepreneurship and innovation in healthcare education and practice, educational institutions, policymakers, and stakeholders must understand the elements that influence entrepreneurial intention among healthcare students. Stakeholders may create targeted interventions, support systems, and policies to help healthcare entrepreneurs succeed by recognizing the major factors of entrepreneurial intention.

This study contributes to the literature by integrating TPB and EEM within the healthcare education context, a novel application of these frameworks. It expands on previous research by demonstrating the mediating role of entrepreneurial self-efficacy and providing actionable insights for fostering entrepreneurship among healthcare students, a relatively underexplored demographic. The extensive influence of self-efficacy on entrepreneurial intention necessitates the accessibility of more effectual entrepreneurship education and trainings for health science undergrads. It will help them strengthen their psychological capital, perceived feasibility and desirability to perform respective entrepreneurial roles. Therefore, the academicians of health sciences should occupy their students in diverse learning opportunities. They should introduce entrepreneurial modules tailored to healthcare, focusing on skills like business planning, opportunity recognition, and leadership. They should also organize workshops and mentoring programs where healthcare students can engage with successful “medipreneurs. Additionally, they must promote experiential learning through hackathons or innovation labs where students can apply entrepreneurial concepts in real-world healthcare challenges.

The implications of entrepreneurial intent among students of health sciences is multifaceted and holds implications for healthcare delivery, revolution, and professional advancement. It drives invention, addresses healthcare needs, advances healthcare delivery, endorses public health, drives economic growth, prepares future leaders, and contributes to the research and development of healthcare. Higher Education Institutions (HEIs) and stakeholders of healthcare should nurture a culture of invention and entrepreneurship in healthcare discipline which welfares patients, communities, and the healthcare professionals. Health sciences graduates’ entrepreneurial drive inspires novelty and new-fangled healthcare resolutions. These graduates pioneer state-of-the-art medical apparatus, technologies, and approaches that boost patient care, diagnosis, cure, and healthcare delivery. Besides, by reassuring entrepreneurship, medical graduates may discover unmet healthcare necessities and generate ingenious solutions. These solutions for marginalized communities, exceptional illnesses, and neglected health contests may expand healthcare equality and access. These graduates may also initiate start-ups to enrich healthcare delivery, resource usage, and patient upshots. They may design state-of-the-art care delivery mechanisms, telemedicine technologies, or “e-well-being platforms” to intensify healthcare related access and proficiency. Additionally, their entrepreneurial aim

embraces pre-emptive and community health solutions. These medical graduates may generate health promotion, wellbeing, or community-based interventions to avert illnesses, endorse healthy behaviors, and mend population health.

Pioneering healthcare students can collaborate across disciplines to resolve complex healthcare matters. They can collaborate with engineers, designers, business analysts, and policymakers to grow new products and businesses. To deliver wide-ranged healthcare invention, education, and delivery, they collaborate across disciplines. These graduates may collaborate with business, academia, government, and non-profits to influence systemic transformation and societal impact. These graduates having entrepreneurial intent may address healthcare discriminations and socioeconomic elements of health to develop world-wide health and sustainable development. They work to advance healthcare infrastructure, illness prevention, and health promotion in resource-limited areas. Infectious illnesses, maternal and child health, and non-communicable diseases in low- and middle-income countries are addressed via social entrepreneurship and innovation. To attain universal health coverage and sustainable development, entrepreneurial medical students push for healthcare access, literacy, and workforce development equality.

Medical students who are entrepreneurial drive healthcare quality and patient safety efforts. Lean healthcare and Six Sigma are used to optimize clinical processes, eliminate medical mistakes, and avoid adverse occurrences. Entrepreneurial medical students promote digital health technology, EHRs, and clinical decision support systems to standardize treatment, promote evidence-based medicine, and enhance care coordination. Continuous improvement and patient safety increase clinical results and patient experiences in healthcare systems. Medical students who start healthcare businesses are ethical and socially responsible. With honesty and openness, they handle complicated ethical issues including patient privacy, data security, and conflicts of interest. They also prioritize social impact and community participation in their entrepreneurial initiatives to solve social issues and promote health equality. Medical students preserve professional ideals and contribute to society by incorporating ethics and social responsibility into their entrepreneurship. Healthcare students who are entrepreneurial improve healthcare system resilience and crisis management. To minimize healthcare service disruptions during pandemics and natural catastrophes, they mobilize resources, devise solutions, and coordinate response activities. Rapid diagnostic testing, remote monitoring, and supply chain innovations help healthcare systems adapt to changing issues. By encouraging innovation and readiness, entrepreneurial medical students increase healthcare system resilience and ensure crisis care continuity. Medical students who promote innovation, entrepreneurship, and patient-centered care lobby for healthcare policy changes. They impact healthcare policy and legislation via policy discourse, stakeholder discussions, and lobbying. Entrepreneurial medical students support healthcare innovation financing, regulatory simplification, and academia-industry-government partnership. They foster healthcare innovation and entrepreneurship by advocating for legislative changes.

Entrepreneurship in health sciences boosts economic development by fostering innovation, job creation, and investment. Business model innovation will play a pertinent role in fostering transformative change and enhance healthcare delivery to boost local and global economies. Promoting medipreneurship will scale innovative solutions, patient outcomes, meeting the unmet needs and the sustainable value creation for all stakeholders. Entrepreneurial health sciences students may conduct medical science and technology research and development. They may work with academics, industry partners, and healthcare organizations to apply scientific findings to patient and provider care. This study was focused on the entrepreneurship training and education, since entrepreneurship has not received the required considerations in the healthcare field. Academicians and policymakers should amend the curricula and instructions to persuade health science undergraduates' entrepreneurial intention. They should also devise policies to encourage entrepreneurship among health science students; it will reduce the burden of unemployment and will help achieving the socio-economic amplification.

5.2. Limitations and Future Recommendations

The entrepreneurial ambition of healthcare students has major consequences for future healthcare delivery, patient care, and public health outcomes. Students may innovate, impact healthcare policy, and meet social needs by developing an entrepreneurial mentality and skill set. Entrepreneurial students also create healthcare start-ups, digital health ventures, and social

enterprises that use technology, data analytics, and interdisciplinary collaboration to improve healthcare accessibility, affordability, and quality. Notwithstanding the varied contributions, this research is not devoid of any constraints. Based on the limitations, various recommendations have been suggested to upcoming researchers. The sample size was selected based on simple random sampling. It is therefore recommended to take quota or stratified sampling to know the entrepreneurial intention in each sub discipline of health sciences. Additionally, the demographic aspects such as; age, gender, study level, and study programs can bring an exciting insight to improve the entrepreneurial intent literature. This study was based on only two baseline theories i.e., TPB and EEM however, there are certain other potential theories regarding EI in the education filed e.g., expectancy theory, entrepreneurial intention model, social cognitive career theory model. It is recommended to the future authors to investigate EI with a different theoretical base. Future research could adopt the Social Cognitive Career Theory (SCCT) framework to explore how personal and environmental factors influence entrepreneurial intentions.

The study used simple random sampling to minimize selection bias however, potential biases such as an overrepresentation of certain genders or study years could influence the findings. Future studies could address this by employing stratified sampling to ensure proportional representation across key demographic variables. Additionally, longitudinal studies employing mixed methods could track the development of entrepreneurial intent over time, particularly in the context of emerging technologies like artificial intelligence in healthcare. Moreover, the impact of industry academia partnership must be investigated in the current model to ensure medipreneurship via incubation hubs/canters. Artificial intelligence (AI) and machine learning (ML) are transforming the healthcare by empowering predictive analytics, diagnostic imaging, and clinical decision support (Adefemi et al., 2023). Healthcare entrepreneurs should also develop unwavering AI-powered tools and algorithms to analyze large datasets, classify patterns, and optimize treatment pathways, leading to more precise diagnoses, custom-made treatments, and cost-effective care provision (Olorunsogo et al., 2024). Future authors are also recommended to research some additional factors of EI in education sector e.g., environmental, social, educational, personality and other cognitive factors. Moreover, career counselling plays a tremendous role in reducing unemployment (Shahzadi, Rafiq, & Ali, 2022) therefore, it is recommended to investigate the influence of career counselling in enhancing entrepreneurial intention among undergraduates. There is still need to reaffirm the application of TPB and EEM by using qualitative or mixed method approach. Additionally, the emerging tools of artificial intelligence may play a significant role in improving entrepreneurial intention, should be investigated in the forthcoming studies.

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