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ENTREPRENEURIAL KNOWLEDGE, ATTITUDES AND PERCEPTIONS AMONG UNDERGRADUATES PHARMACY STUDENTS IN SELANGOR, MALAYSIA

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Abstract: *The role of entrepreneurship is vital in driving economic development and fostering innovation. However, there is a lack of exploration into the extent of entrepreneurial knowledge, attitudes, and perceptions among pharmacy students, especially in the context of Malaysia. Understanding these factors is crucial to instilling an entrepreneurial mindset and equipping students with various career opportunities in the ever- evolving pharmacy field. This study aims to determine the extent of knowledge, attitudes, and perceptions of pharmacy students from the UiTM Selangor towards entrepreneurship and to compare the knowledge, attitudes, and perceptions towards entrepreneurship between first-year and final-year pharmacy students. This study employed a cross- sectional survey method. Three hundred and twelve undergraduate pharmacy students responded to a structured questionnaire using the Likert scale. The questionnaire consisted of four sections with 29 items. The questionnaire was tested for content validity and achieved a high reliability score with a Cronbach's Alpha of 0.93. The survey was conducted from March to May 2024. The outcomes were analyzed to compute mean scores, and an independent samples t-test was conducted using SPSS version 28.0. Pharmacy students have shown a strong understanding of entrepreneurship, scoring notably high in entrepreneurial vision, risk-taking, leadership, communication skills, and workplace environment awareness. The overall knowledge and attitudes towards entrepreneurship were positive. However, perceptions were generally neutral across student cohorts. Statistical analysis indicated significant differences in knowledge and perceptions*

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between first-year and final- year students, highlighting on how academic progression significantly impacts the way students understand and perceive entrepreneurship. Pharmacy students have positive level of knowledge and attitudes but neutral perceptions toward entrepreneurship. Final-year students significantly show better knowledge but less positive attitudes and perceptions towards entrepreneurship. Continuous and practical entrepreneurial education throughout the pharmacy program is important to sustain and enhance positive knowledge, attitudes, and perceptions of entrepreneurship among students.

Keywords: *Entrepreneurship, Pharmacy Education, Knowledge, Attitudes, Perceptions*

Introduction

Pharmacy is a branch of medicine responsible for manufacturing and distributing medications for human or animal purposes. Nonetheless, the pharmacy profession has evolved over time from having a standard drug-focused strategy to one that is more patient- centered (Olubusola & Shittu, 2022). Pharmacy education programs primarily impart essential skills and expertise to aspiring pharmacists. The program emphasizes the fundamental principles of pharmacy practice and covers various topics, including drug discovery, drug action, pharmacology, therapeutics, and patient care.

Entrepreneurship is a disciplined, self- sufficient activity that replaces old habits with new ones (Diandra & Azmy, 2020). Entrepreneurial refers to an entrepreneur's mentality or attributes (Bremmer, 2015). This applies to people with entrepreneurial qualities who are not starting a new business. In pharmacy, pharmacy professionals with entrepreneurial spirit pursue various initiatives to establish and manage community pharmacies and businesses (Laverty et al., 2015). By doing so, they aim to provide better healthcare services to the people in their communities. These professionals are driven by their passion and commitment to the pharmacy field, and they take great pride in providing quality services to their customers. The entrepreneurial mindset of these pharmacy professionals enables them to identify and seize new opportunities. Pharmacy professionals contribute significantly to improving their communities by providing essential healthcare services.

In pharmacy practice, entrepreneurship uses innovation and creativity to create new opportunities for pharmacists. It involves thinking outside the box to develop new ideas and solutions that can benefit the pharmacy field. In the context of pharmacy education, entrepreneurship often involves schools placing a stronger focus on encouraging innovation, creativity, and thinking outside the box in which students are encouraged to develop new ideas and approaches, fostering an entrepreneurial mindset in pharmacy (Mattingly et al., 2019). Acquiring a deep understanding and knowledge of entrepreneurship's theoretical and practical aspects significantly enhances the chance of an individual initiating their venture or engaging in entrepreneurial pursuits, as stated in entrepreneurial human capital (EHC) theory (Ni & ye, 2018). According to research conducted by Del Giudice et al. (2017), attitude is a trait that may alter over a particular period of time. It provides insight into how individuals will act in the future (Mejjah et al., 2021). The attitude toward entrepreneurship refers to an individual's inclination, mindset, and disposition towards engaging in entrepreneurial activities (Mahmood et al., 2020). Meanwhile, perception pertains to an individual's ability to observe, understand, and infer information (Iwu et al., 2020).

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According to the review by Mattingly et al., risk-taking and creativity or innovation are the most commonly mentioned skills and abilities for a pharmacist entrepreneur, with 17 out of 27 manuscripts highlighting their importance (Mattingly et al., 2019). Being willing to take risks and having a creative and innovative mindset are considered crucial for pharmacists who want to be successful entrepreneurs. Other important skills and abilities related to pharmacy entrepreneurship mentioned in the articles include being self-motivated, having good management skills, being proactive, having effective communication, strategic planning, maintaining a positive attitude, making decisions, working well in teams, being adaptable, understanding marketing, critical thinking, being competitive, developing proposals, having numerical skills, utilizing technology, self-reflection, being persistent, having social responsibility, and cultural competence (Mattingly et al., 2019). These skills are considered valuable for pharmacists who want to pursue entrepreneurial endeavors in the field of pharmacy. Regarding entrepreneurial intentions and perceptions, Olubusola & Shittu found that how much someone desires to be an entrepreneur is an important factor in determining if they intend to pursue entrepreneurship (Olubusola & Shittu, 2022). In other words, if someone thinks being an entrepreneur is desirable, they are more likely to have the intention to become one. This suggests that understanding people's perceptions and attitudes towards entrepreneurship can help predict their likelihood of pursuing it as a career. Acquiring a deep understanding and knowledge of entrepreneurship's theoretical and practical aspects significantly enhances the chance of an individual initiating their venture or engaging in entrepreneurial pursuits, as stated in EHC theory (Ni & Ye, 2018). The attitude toward entrepreneurship refers to an individual's inclination, mindset, and disposition towards engaging in entrepreneurial activities (Mahmood et al., 2020). A positive attitude toward entrepreneurship reflects a favorable view of entrepreneurial endeavors, a willingness to take risks, a proactive approach to identifying and pursuing opportunities, and a belief in one's ability to succeed as an entrepreneur. Meanwhile, perception pertains to an individual's ability to observe, understand, and infer information, which significantly influences their willingness to engage in entrepreneurial activities (Iwu et al., 2020).

There are several career paths available to pharmacy students after completing their pharmacy school education. However, the career options for pharmacy graduates remain limited upon entering the labor market despite their extensive education and training in pharmacy. Nevertheless, pursuing entrepreneurship can be an alternative career option for pharmacy graduates. Pharmacy students with good and positive knowledge, attitudes, and perceptions (KAP) toward entrepreneurship can create opportunities by pursuing a career in entrepreneurship. Entrepreneurial knowledge, attitudes, and perceptions among undergraduate pharmacy students are crucial in shaping the future of pharmacy practice and education. Currently, there is limited research exploring this specific aspect within the pharmacy education domain. Recognizing the evolving role of pharmacists and the potential for entrepreneurship in the pharmaceutical sector, it is crucial to assess how pharmacy students understand, behave, and perceive entrepreneurship.

The objectives of this study are to determine the extent of knowledge, attitudes, and perceptions of pharmacy students from the UiTM Selangor towards entrepreneurship and to compare the KAP towards entrepreneurship between first-year and final-year pharmacy students in UiTM Selangor. This study could assist in addressing gaps in understanding regarding the extent of KAP of pharmacy students toward entrepreneurship, as it can provide valuable insights for pharmacy students as well as educational institutions.

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Research Methodology

Study design

Cross-sectional studies were performed to determine the extent of knowledge, attitudes, and perceptions of pharmacy students towards entrepreneurship and to compare the knowledge, attitudes, and perceptions towards entrepreneurship between first-year and final-year pharmacy students in UiTM Selangor. The inclusion criteria for participants were students from the Faculty of Pharmacy at UiTM Puncak Alam, specifically those in their first to fourth years. The exclusion criteria of participants were students who unwilling to participate in the survey. The research participants received information about the study objectives and questionnaire instructions. All the participants were divided into groups based on their educational year.

Based on the calculation with a 5% margin of error, 95% confidence level, and 50% response distribution, at least 253 students were required out of a total population of 740 students. Considering the loss of attrition, the sample size was increased by 20%, therefore the number of samples collected in the study was 304. Using stratified sampling techniques, the sample size calculation in this study aimed to capture the variability present in different strata within the population under investigation (Table 1).

Table 1: Calculation of Stratified Random Sampling

EducationYear	Number of students	Stratified Random Sampling
Year 1	211	86.68 ≈ **87**
Year 2	181	74.36 ≈ **74**
Year 3	175	71.9 ≈ **72**
Year 4	173	71.07 ≈ **71**
Total		304

Research Instrument

The design for this research was a cross-sectional online survey. A preliminary survey instrument assessment was conducted to identify and address potential issues before the full-scale implementation. The questionnaire was validated by the lecturers who involve in the entrepreneurship subject to ensure its content consistency. The internal consistency of the KAP survey questionnaire was calculated by Cronbach's alpha, with a value of 0.93 for each of the three constructs. An initial pilot study was performed among 30 participants, representing a percentage of the anticipated total participants, with specific criteria for participant inclusion to evaluate its acceptability and consistency. The questionnaire is taken with modifications from the previous studies (Albarraq et al., 2020; Amofah & Saladrigues, 2022; Vamvaka et al., 2020).

The questionnaire included four sections of 29 items:

1. Section A: Sociodemographic Information (4 items).
2. Section B: Knowledge Towards Entrepreneurship (15 items).
3. Section C: Attitudes Towards Entrepreneurship (5 items).
4. Section D: Perceptions Towards Entrepreneurship (5 items).

Response to each item was recorded on the 5-point Likert scale which are strongly agree (5-points), agree (4-points), neutral (3-points), disagree (2-points), and strongly disagree (1-point).

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Ethical approval

Prior to commencing the research, ethical approval was sought from UiTM Research Ethics Committee (REC) (REC (PH/UG/114/2024 (MR)). The questionnaire was validated by lecturers who possess a deep understanding of the research topic, ensuring its validity and appropriateness. Additionally, permission to adapt the questionnaire was sought from the author via email.

Data collection

To facilitate data collection, the study employed Google Forms, a user-friendly online survey tool. Before the data collection period, a pilot study was conducted on a group of 37 respondents. The data from the pilot study were not included in the data analysis. Then, the reliability of the measurement instrument was assessed using Cronbach's alpha. Cronbach's alpha values were calculated for each scale, indicating satisfactory internal consistency reliability of 0.93, out of 29 questions in the survey

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The data collection period commenced from March 2024 until April 2024, spanning a total of 2 months. During this period, participants were invited to complete the survey that was distributed through instant online messaging platforms (e.g. WhatsApp, Telegram).

Data analysis

The data collected through Google Forms were exported to Excel. Then, the Excel file was imported and analyzed by using Statistical Package for the Social Sciences (SPSS) IBM version 28 software. Results were presented as percentage or frequency to present categorical data such as the demographic characteristics. Meanwhile, continuous data will be demonstrated as mean ± standard deviation (SD). The α priori significance level was set at 0.05.

Results

Demographic Profile

Table 2 depicts the demographic characteristics of the respondents (n = 312). Most respondents were female, comprising 85.9% (n = 268) of the sample, while male students constituted 14.1% (n = 44). The respondents' ages ranged from 18 to 26 years old. The largest age group was 21-23 years old, accounting for 81.1% (n = 253) of the sample. This was followed by the 18-20 age group, representing 16.7% (n = 52) of respondents. A small proportion of students, 2.2% (n = 7), were aged 24-26 years old, and there were no respondents aged 27 years old or above. The distribution of respondents was comparatively equal across the several study years. First-year students represented 28.2% (n = 88) of the sample, second-year students accounted for 23.7% (n = 74), third-year students comprised 24.7% (n = 77), and fourth-year students made up 23.4% (n = 73).

Upon exploring the respondents' involvement in entrepreneurial activities, it was discovered that 50.6% (n = 158) reported having engaged in such activities at some point during their studies. On the other hand, 49.4% (n = 154) of respondents reported that they had not engaged in any entrepreneurship-related activities, demonstrating an almost equal division between those with and without entrepreneurial experience. This distribution offers a thorough perspective on the level of entrepreneurial involvement among the student population. In sum, the survey sample was primarily made up of female students, and most of the respondents were between the ages of 21 and 23. The distribution of students across the various years of study

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was relatively even, and approximately half of the respondents had participated in entrepreneurship activities.

Table 2: Demographic characteristics of the respondents (n = 312)

Characteristics		Frequency N (%)
Gender	Male	44 (14.1%)
	Female	268 (85.9%)
Age (years)	18-20	52 (16.7%)
	21-23	253 (81.1%)
	24-26	7 (2.2%)
Study Year	First year	88 (28.2%)
	Second year	74 (23.7%)
	Third year	77 (24.7%)
	Fourth year	73 (23.4%)
Entrepreneurship Participation	Yes	158 (50.6%)
	No	154 (49.4%)

Description of overall scores obtained by respondents

Table 3 describes the overall scores obtained by 312 respondents. The outcome variables under investigation in the present study were undergraduate pharmacy students' knowledge, attitudes, and perceptions toward entrepreneurship. Each variable was measured using a Likert scale, where the maximum obtainable score was 5, indicating the highest level of agreement or positivity. The responses were analysed to determine the overall mean scores for each variable, providing insight into the students' understanding, mindset, and views on entrepreneurship. The overall mean score for the knowledge of respondents towards entrepreneurship (n = 312) was 3.54±0.60. According to the Likert scale interpretation, this score falls within the range of 3.5-5.0, indicating a positive level of knowledge among the participants. This suggests that the pharmacy students surveyed possess a favourable understanding of entrepreneurial concepts and practices. Similarly, the overall mean score for the attitude of respondents towards entrepreneurship (n = 312) was 3.58±0.74.

This score also falls within the positive range of 3.5-5.0 on the Likert scale, reflecting a generally favorable attitude towards entrepreneurship among the participants. The findings indicate that the students have a constructive outlook on pursuing entrepreneurial ventures. Conversely, the overall mean score for the perceptions of respondents towards entrepreneurship (n = 312) was 3.15±0.76. This score falls within the range of 2.5- 3.4, denoting a neutral perception towards entrepreneurship among the participants. This indicates that while the students possess positive knowledge and attitudes, their perceptions about entrepreneurship remain ambivalent, suggesting potential areas for further education and support to enhance their perception of entrepreneurial activities.

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Table 3: Description of overall scores obtained by respondents (n = 312)

Outcomes variables	Maximum obtainable scores	Scores received by respondents		Mean ± SD
		Minimum score	Maximum score	
Knowledge	5	2.0	5.0	3.54±0.60
Attitudes	5	1.6	5.0	3.58±0.74
Perceptions	5	1.4	5.0	3.15±0.76

Knowledge of respondents towards entrepreneurship

Fifteen questions were provided in the survey to determine the extent of knowledge of undergraduate pharmacy students about entrepreneurship (Table 4). Results of knowledge assessment of the participants regarding general knowledge about entrepreneurship, understanding of business planning, familiarity with Business Model Canvas (BMC), financial requirements knowledge, SWOT analysis skills, market survey understanding, financial statement interpretation, risk-taking awareness, preference for independent work, belief in independent success, leadership qualities, communication skills awareness, vision and mission clarity, healthy working environment creation and curriculum knowledge impact are shown in Table 3. Nearly all entrepreneurship knowledge questions had a highly positive response except for one. Among the questionnaire elements, item B13, which pertains to the awareness of entrepreneurs possessing a defined vision and mission for their duties, achieved the highest mean score of 4.17±0.75. This reflects a substantial alignment among participants regarding the clarity with which entrepreneurs articulate their roles and objectives in their pursuits. Analysis of responses to item B13 revealed that 1.6% of participants (*n* = 5) disagreed with the statement, while 16.0% (*n* = 50) remained neutral. A substantial proportion, comprising 45.8% (*n* = 143) of respondents, concurred with the assertion, while 36.5% (*n* = 114) expressed strong agreement.

In contrast, item B9, which addresses the preference for independent work post-completion of a Bachelor of Pharmacy degree, recorded the lowest average score of 2.94±0.92 among the surveyed parameters. Within the group surveyed, 5.1% (n = 16) strongly disagreed while 24.7% (n =77) indicated disagreement. Nearly half of the participants, comprising 46.2% (n =144), remained neutral in their stance. On the other hand, 18.9% (n = 59) agreed with the statement, with a further 5.1% (n = 16) strongly agreeing. This distribution of responses illuminates the diverse range of perspectives held by participants regarding the content of item B9, capturing a spectrum of opinions from strong disagreement to strong agreement. Additionally, the mean scores for several items exceeded the overall mean knowledge score, indicating a heightened understanding among respondents regarding various facets of entrepreneurship. Specifically, participants demonstrated a mean score of 3.62±0.84, reflecting their proficiency in defining entrepreneurship (Item B1). Additionally, participants exhibited a mean score of 3.96±0.90, denoting their recognition of entrepreneurs as risk-takers (Item B8). Moreover, participants attributed a mean score of 4.09±0.74 to their acknowledgment of entrepreneurs'exceptional leadership qualities (Item B11). Furthermore, participants displayeda mean score of 4.16±0.74, indicating theirawareness of entrepreneurs possessing adept communication skills (Item B12). Lastly, participants demonstrated a mean score of 4.00±0.74, underscoring their awareness of entrepreneurs' efficacy in cultivating a healthy and encouraging work environment (Item B14). These findings suggest a robust understandingand knowledge among participants regarding various aspects of entrepreneurship, encompassing its definition, risk-taking nature, leadership attributes, communication proficiency, and workplace environment cultivation.

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Table 4: Knowledge of respondents towards entrepreneurship (n = 312)

Knowledge questions	Participants' response, N (%)					Mean
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
B1. I can define entrepreneurship.	3 (1%)	26 (8.3%)	96 (30.8%)	149 (47.8%)	38 (12.2%)	3.62±0.84
B2. I understand the process of developing a business plan.	7 (2.2%)	42 (13.5%)	110 (35.3%)	122 (39.1%)	31 (9.9%)	3.41±0.92
B3. I understand the process of creating and filling in Business Model Canvas (BMC).	29 (9.3%)	55 (17.6%)	89 (28.5%)	101 (32.4%)	38 (12.2%)	3.21±1.15
B4. I understand the financial requirements to start and run a business.	16 (5.1%)	46 (14.7%)	97 (31.1%)	122 (39.1%)	31 (9.9%)	3.34±1.00
B5. I understand how to perform a SWOT analysis of the new products that exist in the market.	36 (11.5%)	49 (15.7%)	88 (28.2%)	104 (33.3%)	35 (11.2%)	3.17±1.20
B6. I understand how to conduct a market survey.	21 (6.7%)	42 (13.5%)	114 (36.5%)	111 (35.6%)	24 (7.7%)	3.24±1.00
B7. I understand how to interpret the financial statements.	31 (9.9%)	56 (17.9%)	117 (37.5%)	88 (28.2%)	20 (6.4%)	3.03±1.06
B8. I know that entrepreneurs are risk-takers.	5 (1.6%)	15 (4.8%)	58 (18.6%)	144 (46.2%)	90 (28.8%)	3.96±0.90
B9. After completing my BPharm, I prefer to work independently.	16 (5.1%)	77 (24.7%)	144 (46.2%)	59 (18.9%)	16 (5.1%)	2.94±0.92
B10. I believe I can live a happy and successful life if I work independently.	6 (1.9%)	52 (16.7%)	141 (45.2%)	84 (26.9%)	29 (9.3%)	3.25±0.91
B11. I know that entrepreneurs have great leadership qualities.	0	3 (1.0%)	63 (20.2%)	148 (47.4%)	98 (31.4%)	4.09±0.74
B12. I am aware that entrepreneurs have good communication skills.	0	4 (1.3%)	52 (16.7%)	146 (46.8%)	110 (35.3%)	4.16±0.74
B13. I am aware that entrepreneurs have a clear vision and mission of their responsibilities.	0	5 (1.6%)	50 (16.0%)	143 (45.8%)	114 (36.5%)	4.17±0.75
B14. I am aware that entrepreneurs are efficient in creating a healthy and encouraging working environment.	0	5 (1.6%)	71 (22.8%)	155 (49.7%)	81 (26.0%)	4.00±0.74
B15. The subject that I studied has provided me the enough knowledge about entrepreneurship.	5 (1.6%)	36 (11.5%)	102 (32.7%)	124 (39.7%)	45 (14.4%)	3.54±0.93
			Overall mean: 3.54±0.60			

Attitudes of respondents towards entrepreneurship

The survey included a series of five questions aimed at assessing the attitudes of undergraduate pharmacy students toward entrepreneurship. The responses of respondents' attitudes towards entrepreneurship (n = 312) were recorded in Table 5. The analysis of attitudes among respondents towards entrepreneurship revealed an overall mean of 3.58±0.74. The item with the highest mean score, 3.83±0.83, pertained to participants' perspectives on the appeal of a career as an entrepreneur (Item C2). In response, 6.7% (n = 21) expressed disagreement, 23.7% (n = 74) maintained neutrality, while 49.4% (n = 154) and 20.2% (n = 63) agreed and strongly agreed, respectively. These results suggest a prevalent inclination towards entrepreneurship as a viable career path among pharmacy students at UiTM Selangor (Puncak Alam Campus). All

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items, except item C5, demonstrated mean scores higher than the overall mean for attitudes towards entrepreneurship, which was 3.58±0.74. In contrast, item C5, "Among various career options, I would choose to be an entrepreneur," garnered the lowest mean score of 3.05±1.03, indicating a less favorable attitude towards entrepreneurship as a preferred career choice among the surveyed students. A detailed breakdown of responses showed that a minority of 6.4% (*n* = 20) of participants strongly disagreed with the statement, reflecting a strong opposition to entrepreneurship. Additionally, 22.4% (*n* = 70) of respondents disagreed, further suggesting a notable portion of students who are not inclined towards an entrepreneurial career. The largest proportion of respondents, 40.1% (*n* = 125), remained neutral on this item, indicating a significant degree of uncertainty or ambivalence about choosing entrepreneurship over other career paths. Meanwhile, 22.1% of participants (*n* = 28) agreed with the statement, showing some level of interest in entrepreneurship, and 9.0% (*n* = 28) strongly agreed, expressing a clear preference for pursuing an entrepreneurial career.

In the analysis of attitudes towards entrepreneurship among the respondents, item C4, "For me, being an entrepreneur would give me a lot of satisfaction," and item C1, "For me, being an entrepreneur has more advantages than disadvantages," both yielded an identical mean score of 3.71. Item C4 had a standard deviation of 0.97, while item C1 had a standard deviation of 0.78. These results, with mean scores falling within the 3.5-5.0 range, indicate a positive attitude among the respondents. Specifically, the participants generally believe that entrepreneurship is both satisfying and advantageous, reflecting an overall favorable outlook towards entrepreneurial pursuits.

Table 5: Attitudes of respondents towards entrepreneurship (n = 312)

Attitudes questions	Participants' response, N (%)					Mean
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
C1. For me, being an entrepreneur has more advantages than disadvantages.	1 (3%)	11 (3.5%)	115 (36.9%)	135 (43.3%)	50 (16.0%)	3.71±0.78
C2. For me, a career as an entrepreneur is interesting.	0	21 (6.7%)	74 (23.7%)	154 (49.4%)	63 (20.2%)	3.83±0.83
C3. I would like to start a company if I have the opportunity and resources.	7 (2.2%)	26 (8.3%)	86 (27.6%)	125 (40.1%)	68 (21.8%)	3.59±0.90
C4. For me, being an entrepreneur would give me a lot of satisfaction.	3 (1.0%)	28 (9.0%)	114 (36.5%)	115 (36.9%)	52 (16.7%)	3.71±0.97
C5. Among various career options, I would choose to be an entrepreneur.	20 (6.4%)	70 (22.4%)	125 (40.1%)	69 (22.1%)	28 (9.0%)	3.05±1.03
Overall mean: 3.58±0.74						

Perceptions of respondents towards entrepreneurship

The questionnaire encompassed a sequence of five queries tailored to gauge the perceptions held by undergraduate pharmacy students regarding entrepreneurship. The recorded responses regarding participants' perceptions of entrepreneurship (*n* = 312) were recorded in Table 6. The overall mean of respondents' perceptions of entrepreneurship was found to be 3.15±0.76. Among the perceptions assessed, item D5, "I perceive a high level of support for entrepreneurship within my pharmacy program," obtained the highest mean score of 3.26±0.82. This indicates a prevalent perception among participants regarding the existence of robust

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support for entrepreneurial endeavors within their academic domain. The breakdown of participant responses revealed that 1.0% strongly disagreed, 13.8% disagreed, 50.6% remained neutral, 27.6% agreed, and 7.1% strongly agreed with the statement. Such findings suggest a diverse spectrum of perceptions, with a substantial portion perceiving a favorable environment for entrepreneurship within their academic setting.

Conversely, item D4, with the lowest mean score of 3.00±0.95, reflects less confidence among respondents in initiating and maintaining a company. Participant responses to this item indicated that 3.5% strongly disagreed, 27.9% disagreed, 40.4% remained neutral, 21.5% agreed, and 6.7% strongly agreed with this perception. All items except D1, D3, and D4 have a higher mean than the overall mean of perceptions. Notably, item D2, "If I tried to start my own company, I would have a good chance of success," has a mean score of 3.23±0.85. This suggests that a significant portion of the respondents feel optimistic about their potential for entrepreneurial success. The relatively high mean score for item D2 highlights students' confidence in their entrepreneurial capabilities, reflecting a positive perception of their chances of success if they were to start their own businesses.

Table 6: Perceptions of respondents towards entrepreneurship (n = 312)

Perceptions questions	Participants' response, N (%)					Mean
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
D1. If I wanted to, I could easily pursue a career as an entrepreneur.	10 (3.2%)	69 (22.1%)	126 (40.4%)	81 (26.0%)	26 (8.3%)	3.14±0.96
D2. If I tried to start my own company, I would have a good chance of success.	2 (0.6%)	54 (17.3%)	148 (47.4%)	85 (27.2%)	23 (7.4%)	3.23±0.85
D3. I have the skills and capabilities to succeed as an entrepreneur.	6 (1.9%)	72 (23.1%)	137 (43.9%)	75 (24.0%)	22 (7.1%)	3.11±0.91
D4. I am confident in my ability to start and sustain a company.	11 (3.5%)	87 (27.9%)	126 (40.4%)	67 (21.5%)	21 (6.7%)	3.00±0.95
D5. I perceive a high level of support for entrepreneurship within my pharmacy program.	3 (1.0%)	43 (13.8%)	158 (50.6%)	86 (27.6%)	22 (7.1%)	3.26±0.82
Overall mean: 3.15±0.76						

Comparison of mean score for knowledge, attitudes, and perceptions of first year and final year students

The comparison of mean scores between first-year and final-year pharmacy students, as presented in Figure 1, demonstrated significant differences in knowledge and perceptions towards entrepreneurship. In contrast, no significant differences were observed in attitudes.

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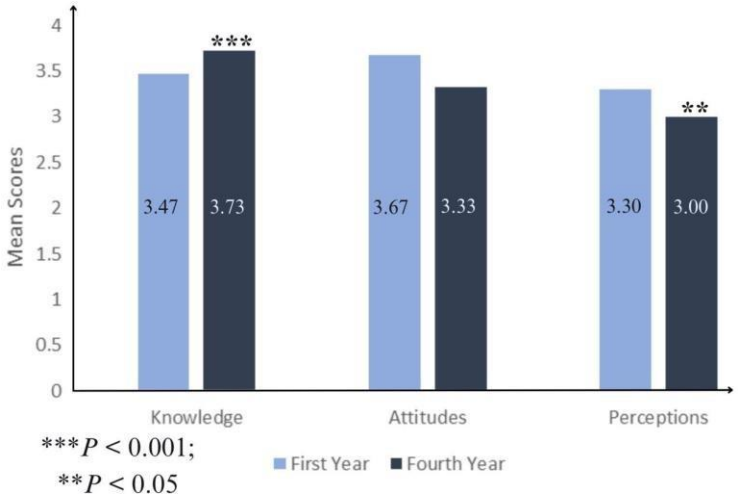

Figure 1: Comparison of Mean Score for Knowledge, Attitudes and Perceptions of First Year and Final Year Students

The mean score for knowledge among first-year students was 3.47±0.66, while the mean score for final-year students was 3.73±0.48. The difference in mean scores was statistically significant (p-value < 0.001), indicating that final- year students have a significantly higher level of knowledge about entrepreneurship compared to first-year students.

The mean score for attitudes towards entrepreneurship for first-year students was 3.67±0.86, compared to 3.33±0.75 for final-year students. Although the mean score for first-year students was higher, the difference was not statistically significant (p-value = 0.070). This suggests that there is no significant difference in attitudes towards entrepreneurship between first-year and final-year students.

The mean score for perceptions of entrepreneurship was 3.30±0.86 for first- year students and 3.00±0.73 for final-year students. The difference in mean scores was statistically significant (p-value = 0.027), indicating that first-year students have a more positive perception of entrepreneurship compared to final-year students.

Overall, these results highlight that there are significant differences in the levels of knowledge and perceptions of entrepreneurship between first-year and final-year pharmacy students, with final- year students showing higher knowledge but lower perceptions compared to their first-year counterparts. However, attitudes towards entrepreneurship did not show a significant difference between the two groups.

Discussion

In this study, a total of 740 questionnaires were distributed to undergraduate pharmacy students at UiTM Selangor, of which 312 were completed and returned, yielding a response rate of 42.16%. The response rate is generally considered high and indicative of a well- designed survey that effectively engages the target audience. This rate is higher than the average online survey response rate, typically around 20-30%. In the preliminary phase of this research, a pilot study was conducted involving 30 participants who met the inclusion criteria. However, the data obtained from this preliminary phase were not incorporated into the final analysis of the study. The robustness of the survey instrument was confirmed with a Cronbach's alpha value of 0.93, indicating a high level of internal consistency and reliability of the measures used to

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assess the entrepreneurial knowledge, attitudes, and perceptions among the pharmacy undergraduates at UiTM Selangor. This high degree of reliability underscores the validity of the findings and supports their potential generalizability within similar academic settings.

The results of the present study indicated that the assessment of entrepreneurial knowledge among the pharmacy students yielded an overall mean score of 3.54±0.60 (n = 312), which, according to the Likert scale interpretation, signifies a positive level of knowledge as it falls within the range of 3.5-5.0. The distribution of respondents across different study years (first-year to fourth-year) was relatively balanced. This suggests that positive entrepreneurial knowledge is not limited to specific academic stages but is cultivated throughout the pharmacy curriculum. Progressive exposure to entrepreneurship- related coursework and activities may enhance students' understanding of entrepreneurial principles and practices over time. Therefore, this result suggests that the respondents have a commendable grasp of entrepreneurial concepts and practices. In comparison, the previous research findings by Albarraq et al. in 2019 indicate that pharmacy students demonstrate sufficient entrepreneurial knowledge, mindset, personality, and attitude (Albarraq et al., 2020). Previous studies (Tung et al., 2020; Coduras et al., 2016; Ruiz et al., 2016) have provided evidence that knowing entrepreneurship plays a crucial role in preparing oneself for entrepreneurship, initiating a new business, and expanding it successfully (Saptono et al., 2020). Zeng et al. also obtained a similar result through the students' interviews from their study as it was proven that the majority of students strongly advocate for the importance of learning about entrepreneurship to establish a successful business (Zeng et al., 2023). In the context of entrepreneurship, a clear vision and mission are crucial for guiding organizational strategy and fostering alignment among stakeholders (Alnuhait et al., 2024)). The high mean score for item B13 indicates that most participants recognize and value the importance of having a clear vision and mission in entrepreneurship. Pharmacy students acknowledge that these aspects offer guidance, purpose, and drive for their entrepreneurial pursuits. A well-defined vision and mission act as a beacon, aiding entrepreneurs in prioritizing and strategically aligning decisions with their future aims. This perspective is consistent with existing research underscoring the significance of vision and mission in entrepreneurship, as they establish a pathway to success and foster concentration on entrepreneurial goals (Showande & Durowaiye, 2019). Conversely, the lowest average score of 2.94±0.92 for the preference for independent work post-BPharm highlights a hesitance or lack of inclination towards entrepreneurial pursuits immediately after graduation. The inclination of pharmacy students towards teamwork, as observed in this study, corroborates with findings from previous research. A study conducted at a UK School of Pharmacy revealed that final-year students not only preferred teamwork for its role in enhancing professional development but also favoured team-based activities in their assessments (Hanna et al., 2020). These previous studies support the notion that pharmacy students value the collaborative learning environment, which is reflective of the interprofessional nature of healthcare. The emphasis on teamwork in these studies aligns with the current study's findings, suggesting a broader trend across different educational settings and geographical locations.

The overall mean score for the students' attitudes towards entrepreneurship was 3.58±0.74 (n = 312), also positioned within the Likert scale's positive spectrum and indicating a generally favorable disposition towards entrepreneurial endeavors. Approximately half of the respondents reported engagement in entrepreneurship-related activities during their studies. This active participation suggests a positive correlation between practical engagement and favorable attitudes toward entrepreneurship (Al-Qadasi et al., 2024). Students who actively participate in entrepreneurial activities may develop a deeper appreciation for the challenges

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and rewards associated with entrepreneurial ventures, thereby shaping their positive attitudes. This study is similar to evidence from studies in Saudi Arabia as they found a generally positive disposition among pharmacy students (Albarraq et al., 2020). These findings underscore the students' readiness to consider entrepreneurship a viable career path. The findings of the study are in congruence with previous research, which has indicated a positive attitude and interest in entrepreneurship among pharmacy students. For instance, a study exploring entrepreneurship in pharmacy reported that nearly 80% of participants expressed interest in entrepreneurship and believed in the entrepreneurial potential of pharmacists despite a knowledge gap where only 52% were familiar with entrepreneurship concepts (Alnuhait et al., 2024). Similarly, another study highlighted that pharmacy students possessed adequate entrepreneurial knowledge and attitude but lacked confidence and skills for venturing into entrepreneurship post- graduation (Albarraq et al., 2020). Another study also found that pharmacy students possess a robust entrepreneurial spirit, as evidenced by their sustained high levels of entrepreneurial tendencies throughout the study (Showande & Durowaiye, 2019). The students' positive knowledge and attitudes towards entrepreneurship further reinforce this entrepreneurial inclination, which may be instrumental in nurturing their aspirations to become business owners. Such a trend suggests that educational exposure and experiences within the pharmacy program may be pivotal in shaping these entrepreneurial ambitions.

A high mean score of 3.83±0.83 for Item C2 ("A career as an entrepreneur is appealing to me") indicates a significant level of interest and enthusiasm among students for the concept of entrepreneurship. A substantial 69.6% of participants (49.4% agreed and 20.2% strongly agreed) found an entrepreneurial career appealing. This suggests that pharmacy students recognize the potential benefits and positive aspects of being an entrepreneur. The growing enthusiasm for entrepreneurship and business ownership among pharmacy students, as evidenced in the current study, is in line with previous research indicating a strong interest in establishing and managing businesses and engaging in entrepreneurial initiatives. A previous study conducted by Sweaney et. al in (2014) found that student pharmacists exhibited a significantly higher interest in pharmacy ownership compared to recent graduates, underscoring the entrepreneurial aspirations prevalent among pharmacy students. Numerous factors contribute to pharmacy students' strong inclination to pursue entrepreneurial careers. One factor includes owning a pharmacy or related business, which presents compelling financial prospects compared to salaried positions, offering the potential for increased earnings (Martins et al., 2023). This presents an appealing opportunity for individuals aspiring to achieve financial advancement. Other than that, pharmacy students are drawn to entrepreneurial careers because they strongly desire to impact community healthcare services and patient well-being. Their passion for positive change leads them to pursue entrepreneurial paths, where they can introduce innovative solutions and directly improve the quality of care (Mattingly et al., 2019). Finally, the expanding market for specialized pharmaceutical services offers numerous opportunities for entrepreneurial ventures among pharmacy students (Huston, 2018). These prospects are further heightened by the increasing complexity of healthcare needs and the continuous advancements in pharmaceutical technology. The increasing demand for specialized healthcare solutions highlights the importance and potential financial viability of entrepreneurial initiatives within the pharmaceutical industry.

Despite entrepreneurship being highly appealing, Item C5 ("Among various career options, I would choose to be an entrepreneur") recorded the lowest average score of 3.05±1.03. This suggests that pharmacy students are more cautious when considering entrepreneurship as their main career choice. The mixed responses indicate that although the concept of entrepreneurship

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is attractive, various practical and psychological factors such as lack of confidence, risk aversion, or preference for more traditional career paths may discourage pharmacy students from pursuing it as a primary career choice for their future (Mat Rashid et al., 2021). Although students might find entrepreneurship appealing in theory, the practical challenges and obstacles of launching and maintaining a business can be intimidating (Bhaskar et al., 2022).

Based on the results of the present study, the overall mean score of perceptions towards entrepreneurship was 3.15±0.76 (n = 312), which aligns with the neutral category on the Likert scale, ranging from 2.5-3.4. This neutrality points to an ambivalence in perceptions about entrepreneurship despite the positive knowledge and attitudes observed. The distribution of respondents across different study years (first-year to fourth-year) was relatively even. This suggests that neutral perceptions towards entrepreneurship are not significantly influenced by academic progression alone but rather by broader factors such as career aspirations, educational experiences, and personal interests (Wasim et al., 2024). Additionally, roughly half of the respondents reported engagement in entrepreneurship-related activities during their studies, while the other half did not. This balanced engagement indicates a diverse range of experiences and interests among pharmacy students, contributing to their overall neutral perceptions of entrepreneurship. In contrast, this study found a neutral perception towards entrepreneurship which contrasts with the positive attitudes and perceptions reported by pharmacists and pharmacy students in another study, despite their limited knowledge of innovation (Odeh et al., 2022). This suggests that while pharmacy students have an inherent interest in and a positive disposition toward entrepreneurship, enhanced educational strategies are needed to bridge the gap between knowledge, attitude, and entrepreneurial engagement. This would seek to align their perceptions more closely with their knowledge and attitudes in this field.

The highest mean score of 3.26±0.82 for Item D5 ("I perceive a high level of support for entrepreneurship within my pharmacy program") indicates that pharmacy students perceive a supportive environment for entrepreneurship within their academic setting. The prevailing perception might be influenced by the presence of entrepreneurship education in particular pharmacy programs (Hua et al., 2022). These programs provide dedicated courses or workshops focused on entrepreneurship within the field of pharmacy practice. This aligns with the previous study by Al-Ghananeem et. al, (2018) who emphasized the importance of incorporating entrepreneurship education into pharmacy practice. Additionally, this perception can be attributed to the emphasis on skills development within their pharmacy programs. Entrepreneurship necessitates specific knowledge, skills, and attitudes (KSAs), including risk-taking, strategic planning, marketing, and social responsibility (Mattingly et al., 2019). Pharmacy education is designed to nurture these abilities, aiming to establish a setting that encourages students' development of entrepreneurial thinking. By incorporating these KSAs into their curriculum, institutions effectively encourage and support entrepreneurial initiatives among pharmacy students (Mattingly et al., 2019).

Conversely, Item D4, which obtained the lowest mean score of 3.00 ± 0.95, signifies the respondents' lack of confidence in initiating and sustaining a company, which can be attributed to their insufficient entrepreneurial skills. Similar concerns have been raised in another research. In a recent systematic review conducted by Mattingly II et. al (2019), the emphasis was placed on identifying an essential collection of knowledge, skills, and attitudes (KSAs) that are particularly important for pharmacist entrepreneurs. Consistent with prior research, it has been observed that pharmacy students from Jazan University demonstrate adequate entrepreneurial knowledge, mindset, personality, and attitude. Nevertheless, they exhibit a

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deficiency in confidence and skills necessary for executing entrepreneurial activities following graduation (Albarraq et al., 2020). The result of the present study revealed that pharmacy students perceive their academic environment as supportive of entrepreneurship. Nevertheless, students may perceive themselves as inadequately prepared with the requisite knowledge and skills to initiate and maintain a business, which could be attributed to limited exposure to entrepreneurial education and practical experience in the entrepreneurial process (Nguyen et al., 2022). Thus, while the academic setting is perceived positively, a perceived gap exists in equipping students with the practical competencies essential for effective entrepreneurial endeavors. Additionally, the demographic characteristics of the respondents provide valuable context for understanding the less positive entrepreneurial perceptions observed among final-year students. The majority of the sample consisted of female students (85.9%), which suggests that women are less likely to pursue entrepreneurship compared to men. This finding is consistent with the previous study by Mehtap et al. (2017), and many factors may have contributed to this phenomenon, including the widespread belief that entrepreneurship is a male- dominated field, specific economic and social circumstances, and a pervasive lack of self-assurance in their capacity to thrive in entrepreneurial pursuits (Hamdni et al., 2023). In addition, pharmacy students may tend to prefer the stability of employment over the uncertainty and personal financial risks associated with entrepreneurship (Alnuhait et al., 2024). This risk-averse mindset can diminish their confidence in their entrepreneurial abilities. It is imperative to address these confidence issues as self-efficacy plays a vital role in entrepreneurial intention and action, and higher levels of self-efficacy are linked with stronger start-up performance. This confidence can greatly enhance an entrepreneur's capabilities to engage in entrepreneurial activities, such as initiating a business venture and introducing innovative concepts (Caliendo et al., 2023). Engaging in entrepreneurial activities serves as a practical avenue for students to enhance their communication and problem-solving skills, ultimately fostering the confidence needed to conquer challenges and attain success (Laverty et al., 2015).

In this study, the entrepreneurial knowledge, attitudes, and perceptions among pharmacy students at UiTM Selangor were investigated. Specifically, these aspects were compared between first-year and final-year students. The findings of the present study revealed a significant difference in entrepreneurial knowledge between the two student groups. Final- year students exhibited a higher level of knowledge (mean score: 3.73 ± 0.48) compared to first-year students (mean score: 3.47 ± 0.66). Studies have shown that as students' progress through their academic programs, they tend to acquire more knowledge and skills related to entrepreneurship. Entrepreneurial education has a positive impact on entrepreneurial knowledge, as supported by previous research (Tung et al., 2020). This implies that when individuals receive education focused on entrepreneurship, it enhances their understanding and expertise in entrepreneurial concepts and practices. Their finding is also in line with the findings of Jena (2020), who also found that educational activities in entrepreneurship education help students enhance their entrepreneurial awareness, skills, and mindset and provide them with the tools and knowledge needed to start their businesses. Similarly, the research of Karyaningsih (2020) supports this argument, as they found that entrepreneurial knowledge has a significant impact on students' inclination toward becoming entrepreneurs. The result of the present study aligns with previous research, indicating that as students progress through their academic journey, they acquire more insights into entrepreneurship (Mattingly et al., 2019). The advancement in students' knowledge and skills in entrepreneurship can be credited to a range of factors, such as engagement in specialized courses, hands-on experiences, and a more profound grasp of business principles (de Sousa et al., 2022). Final-year students may have been exposed to more specialized coursework, practical experiences, and mentorship opportunities related to entrepreneurship

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compared to first-year students, which contributes to their enhanced understanding. Educators are crucial in promoting excellent entrepreneurship knowledge through entrepreneurship education. According to Huang et al. (2020), entrepreneurship education should focus on the importance of teachers and their continuous learning through self-reflection. Similarly, specialized programs such as the Experiential Entrepreneurship offered at Northeastern University Oakland strongly emphasize immersive, hands-on learning experiences that involve active participation, careful observation, thorough measurement and analysis, thoughtful introspection, creative problem-solving, and close collaboration with fellow students (Padurean, 2024). Through this experiential approach, students can gain a deep and practical understanding of entrepreneurial concepts and develop a proactive and innovative mindset. Courses specifically focused on entrepreneurship, experiential learning activities such as writing a business plan and working in groups to solve problems, as well as interactions with entrepreneurial role models are known to positively influence students' entrepreneurial knowledge (Vecchiarini et al., 2024). Previous research by Klinger and Schündeln highlighted that entrepreneurship training can provide significant instruction on starting new businesses, leading to a higher likelihood of initiating entrepreneurial ventures (de Sousa et al., 2022). Therefore, it is reasonable to expect that final-year students, who have completed more coursework and possibly engaged in practical experiences related to entrepreneurship, would have a more advanced understanding of entrepreneurial concepts compared to first-year students. The significant difference in knowledge between first-year and final-year students underscores the importance of integrating comprehensive entrepreneurship education early in the curriculum. By providing foundational knowledge and progressively advancing students' understanding through targeted interventions, institutions can better prepare students to navigate entrepreneurial challenges and opportunities upon graduation.

Regarding attitude towards entrepreneurship, the mean scores indicate that first-year students had a slightly higher average attitude score (3.67) than final-year students (3.33). However, the difference was not statistically significant (t-value: 2.700, p-value: 0.070). The lack of significant difference suggests that attitudes towards entrepreneurship among pharmacy students remain relatively stable throughout their academic progression. The findings of this study stand in contrast to existing literature that suggests attitudes toward entrepreneurship can be altered over time due to increased exposure to entrepreneurial education and experiences. (Walter & Block, 2016). Entrepreneurship education refers to the educational activities aimed at cultivating students' interest and intention toward entrepreneurship (Li & Wu, 2019). As defined by Charrón Vías & Rivera-Cruzn (2014), entrepreneurship education involves teaching and learning activities that might influence students' attitudes toward business, such as innovative thinking and willingness to take risks. In addition, another previous study conducted by Showande and Durowaiye (2019) found that pharmacy students across different years (2nd year to 5th year) had generally positive attitudes and intentions toward entrepreneurship but did not find any significant differences between the earlier and later years. Nevertheless, it is consistent with another research by Nabi et. al (2017) that suggests that core attitudes may tend to remain consistent unless they are substantially impacted by targeted interventions. According to a study conducted by Romero-Galisteo et al., (2022), teaching entrepreneurship in universities, including health sciences programs, can positively impact students' self-belief in their entrepreneurial abilities and attitude towards entrepreneurship. Furthermore, the majority of respondents in the study were female, accounting for 85.9% of the total. Despite potential societal barriers, the growing presence of accomplished female entrepreneurs may serve as an encouraging influence for female students among female students (Hamdani et al., 2023; Ismail et al., 2021).

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Finally, regarding perceptions of entrepreneurship, the analysis showed that the average perception of entrepreneurship was 3.30±0.86 for first- year students and 3.00±0.73 for final-year students. This difference was statistically significant (t-value: 2.458, p-value: 0.027), suggesting that first-year students have a more positive view of entrepreneurship than final-year students. In the survey, the 18-20 age group emerged as the second-largest, making up 16.7% of the total respondents. This demographic mainly comprises first-year students and is characterized by a sense of idealism and optimism. These young individuals tend to view entrepreneurship more positively, possibly due to their lesser awareness of the associated challenges and risks. Instead, they are often driven by the thrill and potential of initiating a business venture. Previous research found that optimism plays a crucial role in shaping entrepreneurial intentions among students (Ma et al., 2024). This suggests that first-year students, who are often more optimistic about their future, may have a more positive perception of entrepreneurship than final-year students. Furthermore, the influence of family background on students' entrepreneurial intentions and perceptions is significant (Georgescu & Herman, 2020). According to a previous study by Sandi & Nurhayati (2020), the family environment plays a significant role in shaping a child's character, including entrepreneurial traits. First- year pharmacy students may exhibit a heightened entrepreneurial outlook due to the influence of entrepreneurial family members. These family members foster a supportive environment and nurture entrepreneurial aspirations. This familial support likely contributes to their increased enthusiasm and optimism, positively influencing their perception of entrepreneurship among first-year pharmacy students (Georgescu & Herman, 2020; Costa & Mares, 2016). This finding is also in line with the findings of Siregar (2020). Additionally, the first-year students, representing 28.2% of the sample, are positioned at the initial phase of their educational expedition. During this stage, they typically exhibit elevated levels of passion and inquisitiveness. Their restricted exposure to the more demanding components of the pharmacy curriculum enables them to uphold an idealistic and eager perspective on entrepreneurship, unhampered by practical obstacles. Furthermore, some of the first-year students in the present study may have previously completed diploma programs where they took entrepreneurship courses. This prior exposure to entrepreneurial concepts and practices during their diploma studies could contribute to their more positive perceptions of entrepreneurship as they begin their degree programs.

The largest age group was 21-23 years old, encompassing final-year students preparing to enter the workforce. As students approach graduation, they tend to prioritize stability and job security over entrepreneurial ventures, particularly as they consider the practical demands of their chosen profession in pharmacy. This pragmatic approach reflects their readiness to enter the workforce and apply their skills in traditional pharmacy roles rather than taking on the uncertainties and risks of starting their own businesses. Hence, final-year students have a less positive view of entrepreneurship than first-year students. This is in line with a previous survey of final-year students across various faculties, which revealed that less than half of the final-year students expressed interest in becoming entrepreneurs (Brijlal, 2011). Another factor contributing to the less positive perception of entrepreneurship among final-year students could be their increased focus on clinical pharmacy. As students approach graduation, they might prioritize clinical roles and responsibilities, preparing for careers in clinical settings rather than entrepreneurial ventures. To confirm this observation, future research could investigate the career priorities of final- year students. This shift in focus can result in a reduced emphasis on entrepreneurial pursuits and a more pragmatic approach towards their future careers. This is supported by a previous study by Arbab et al., (2022) who found that clinical pharmacy emerged as the most preferred future career domain, chosen by 30% of the respondents. The

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findings of this present study have important implications for pharmacy education. Since first-year students tend to have a positive attitude toward entrepreneurship, it may be beneficial for educators to incorporate entrepreneurial topics into the curriculum at an early stage.

Conclusion

The study found that pharmacy students at UiTM Selangor have a good understanding and positive level of knowledge and attitudes but neutral perceptions toward entrepreneurship. There are significant differences in knowledge and perceptions of entrepreneurship between first-year and final-year students, but no significant differences in their attitudes. Final-year pharmacy students significantly show better knowledge but less positive attitudes and perceptions toward entrepreneurship. Moreover, given the current saturation of Provisionally Registered Pharmacists (PRP) placements, pursuing entrepreneurship could emerge as a viable alternative career path for pharmacy graduates. As PRP placements become increasingly competitive and limited, entrepreneurship offers graduates opportunities to apply their pharmaceutical knowledge in innovative ways, such as establishing independent pharmacies, consulting firms, or healthcare start-ups. To address these observations, integrating continuous and practical entrepreneurial education from the early years throughout the pharmacy program to foster an entrepreneurial mindset and skills among students is imperative. This approach will not only sustain but also enhance students' positive knowledge, attitudes, and perceptions of entrepreneurship. Future research directions may explore longitudinal trends, evaluate the impact of specific educational interventions, and assess the efficacy of entrepreneurial training initiatives within pharmacy education.

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