RESEARCH

Measuring Entrepreneurial and Intrapreneurial Intentions in Student Pharmacists

Nazneen Fatima Shaikh, BPharm, Mona Nili PharmD, MBA, MS, Nilanjana Dwibedi, MBA, PhD, S. Suresh Madhavan, MBA, PhD

West Virginia University School of Pharmacy, Morgantown, West Virginia
Universisty of North Texas, System College of Pharmacy, Fort Worh, Texas

Submitted April 19, 2019; accepted September 26, 2019; in press October 2019.

Corresponding Author: Nazneen Fatima Shaikh, Department of Pharmaceutical Systems and Policy, West Virginia University School of Pharmacy, Robert C. Byrd Health Sciences Center [North], P.O. Box 9510 Morgantown, WV 26506-9510. Tel: 304-293-1442. Email: ns0067@mix.wvu.edu.

Objective. The objectives of this pilot study were to develop a questionnaire for measuring entrepreneurial and intrapreneurial intentions among student pharmacists, and to identify characteristics and personality traits that are associated with these intentions.

Methods. A 105-items survey was developed and administered to all PharmD students (P0 through P3) at a large public university. It comprised of nine-scales pertaining to entrepreneurism including previously validated and some newly developed scales adapted for use among student pharmacists. Data analysis consisted of factor analysis to determine scale constructs, reliability assessment, and systematic item-reduction analysis. Multiple linear regression and structural equation modeling was used to determine and confirm the association of personality traits and demographic characteristics with entrepreneurial and intrapreneurial intentions.

Results. A total of 286 useable surveys were included. Factor analysis was conducted for each scale and items were removed that did not load on their theorized factor or had cross-loadings above the permissible limits, reducing the survey to 69-items. Findings demonstrated gender, joint degree program, and autonomy as significant predictors of entrepreneurial intentions, and achievement motivation, leadership self-efficacy and problem solving as significant predictors of intrapreneurial intentions.
Conclusions. In this pilot study, we developed a multi-dimensional questionnaire to measure entrepreneurial and intrapreneurial intentions of student pharmacists and identified a few key predictors of such intentions. When fully validated, the questionnaire may be used in the pharmacy schools for several purposes including PharmD admission process to gain additional insights of a student’s potential to become a future innovative entrepreneurial or intrapreneurial practitioner.

Keywords: Entrepreneurship, Intrapreneurship, Pharmacist, Personality traits, questionnaire.

INTRODUCTION

Entrepreneurism is about developing, organizing and managing a business venture. An entrepreneur takes calculated risks to create an innovative solution for a societal problem and promotes it to the community as a self-sustaining business venture, and in the process creates jobs. Intrapreneurs are individuals who can excel at their work within the constraints of an organization, take shared risks, and develop innovative new services or products that are profitable to the organization. In pharmacy, an entrepreneur or intrapreneur would likely develop new services based on the unmet needs of the patients in a community or apply innovative ideas to add or improve services already being provided by an organization.1,2 For example, soon after the Medicare Modernization Act was passed a student pharmacist-led Medicare Part D planning clinic established to help older adults to make informed decisions on choosing the most appropriate Medicare Part D plans for their needs resulted in a potential annual savings of greater than $28,000 with 100% of the patients reporting very satisfied with the service.2 According to entrepreneurism research, several individual characteristics and personality traits are instrumental in motivating entrepreneurial and intrapreneurial intentions and behavior.3–6 Intrapreneurs and entrepreneurs have overlapping traits but with a few differences. An intrapreneur is employed in an organization and takes shared risks with his/her employer as compared to an entrepreneur who owns the business and takes complete responsibility of the risk of possible financial failure.7 Another key difference between them relates to their attitude towards business ownership, with intrapreneurs
found to be less inclined towards ownership as compared to entrepreneurs.8 The rapid growth of hospital, department store, grocery, and chain pharmacies in the past three decades have led to an increase in the number of employee pharmacists.9 This has made the term intrapreneurship highly relevant to the pharmacy profession today to describe those who develop innovative patient-care services (PCS) within institutional or organizational settings.10,11

Measuring entrepreneurial and/or intrapreneurial potential of student pharmacists is important for the role of pharmacists in the present healthcare environment. The forces affecting the health care system including escalating healthcare costs, the increasing burden of chronic diseases, primary care provider shortages, uneven affordability of health care, and poor health outcomes have provided an opportunity for the pharmacy profession to reposition itself to be a problem solver in the healthcare system, particularly as they relate to the appropriate use of medications. Development of innovative PCS and practice models that can improve healthcare quality and outcomes and reduce costs require entrepreneurial and intrapreneurial abilities among pharmacists. To capture the essence of pharmacist involvement in any patient care activity, the Joint Commission of Pharmacy Practice has created the Pharmacist Patients’ Care Process (PPCP). It is a collaborative care framework for delivering patient care such as collecting and assessing patient information, planning and implementing patient-specific care, and subsequently monitoring patients to ensure that appropriate therapeutic outcomes are achieved..12 To emphasize its importance for future pharmacists, the Standards 2016 of the Accreditation Council of Pharmacy Education (Standard 10.8) require that colleges and schools of pharmacy develop their curricula to teach PPCP and assess students’ abilities to provide such PCS. In addition, Standard 4.3-Innovation and entrepreneurship stipulates that, “...the graduate is able to engage in innovative activities by using creative thinking to envision better ways of accomplishing professional goals.”13

With the evolving role of the pharmacists, major national organizations (American Pharmacists Association and American Association of Colleges of Pharmacy) are working toward including pharmacists on the federal list of recognized healthcare providers.14 The Pharmacy and Medically Underserved Areas Enhancement Act has been introduced in the congress with bipartisan support to
amend the Social Security Act section 1861(s)(2) to add pharmacists to the list of recognized health care providers to deliver patient care in medically underserved communities and be eligible for reimbursement for PCS.\textsuperscript{15} With such emerging opportunities for pharmacists to play a role in helping to address unmet healthcare needs and the potential for even newer roles, the need for pharmacists with vision, innovative thinking, and propensity for risk taking has never been greater. However, a qualitative study recently indicated that pharmacists’ have often taken a back seat in instances of assuming leadership roles in times of major decision-making, being wary of the possibilities of future conflicts.\textsuperscript{16} This avoidance may be attributed to risk aversion among pharmacy students reported in several studies.\textsuperscript{4,17,18} Another study by Rosenthal et al., found that community pharmacists perceive themselves as “dispensers of medications” instead of a “patient healthcare provider”.\textsuperscript{19} Findings from these studies indicate perhaps an absence or diminished entrepreneurial personality traits in pharmacists. Since research has repeatedly established personality traits as one of the most important predictors of successful entrepreneurs\textsuperscript{4,20–22}, students with an inclination towards or students with inherent entrepreneurial/intrapreneurial personality traits may be more likely to develop innovative practices or embrace a more patient-oriented role in the future.

\textit{Overall goal and objectives.} A recent study evaluating student pharmacists’ professional identities in Australia, found that pharmacy was not the first career choice for most of the students.\textsuperscript{23} The study also reported that many students were entering the pharmacy program with little or no understanding of the profession. In the US, the admission criteria for pharmacy schools have traditionally focused on pre-pharmacy science courses, pharmacy college admission test scores, and overall grade point average in general education coursework. The admission interviews are generally focused on ascertaining written and verbal communication skills and student aptitude and preparation for a pharmacy career. Given the emphasis on science accomplishments, it is possible that the admission process may be unintentionally excluding those students who are likely to become risk-taking innovators/entrepreneurs in the pharmacy profession. Having reliable and validated measures of identifying entrepreneurial and/or intrapreneurial traits and intentions among incoming student pharmacists may be necessary for the development of future pharmacists to succeed in a profession that increasingly needs more risk takers and
innovators for its future success. Thus, the objectives of this pilot study were to: (a) develop a questionnaire to measure entrepreneurial intentions (EI) and intrapreneurial intentions (II) of student pharmacists; and, (b) identify the characteristics and personality traits among student pharmacists that are associated with EI and II.

METHODS

A cross-sectional study design was utilized to survey all incoming students (P0), first (P1), second (P2) and third (P3) year students of the PharmD program at West Virginia University.

In this pilot study, there were two dependent variables, EI and II. A questionnaire was developed using previously established and validated scales. A thorough review of the literature initially identified a total of nineteen constructs associated with EI and II. Given time and respondent fatigue considerations, the research team narrowed down the constructs to nine as being most commonly associated with the above intentions and relevant to pharmacy. The questionnaire was divided into two parts, the first part consisted of 90 items measuring nine personality traits constructs along with EI and II. The items were measured on a seven-point Likert scale (strongly disagree=1, strongly agree=7). The personality traits constructs included were: locus of control, innovativeness, autonomy, risk taking, proactiveness, achievement motivation, people liking, problem-solving, and leadership self-efficacy. These traits were included based on their association with EI and II, past literature and empirical knowledge.24–38 Each of the scales used are well-established in the literature with good validity and reliability, and accounted for 50 items. Table 1 represents the scales used for each construct with one sample item. The key dependent variables, EI and II were assessed by items adapted from a study by Douglas et al.8 EI was measured using four items (eg, “I want to be self-employed within two years of graduation”) and II used three items (eg, “I want to manage a division (within a pharmacy or company) that is set up to exploit a radical innovation in patient care”). The second part of the questionnaire consisted of categorical items addressing demographic and educational characteristics including age, gender, race, annual income and
marital status along with questions related to participating in a joint degree program and a question about any family member being involved in business.

Students from each of the four PharmD classes participated in the anonymous and voluntary survey. The data collection was carried out in four different classroom settings with instructor approval at West Virginia University resulting in a convenience sample of all PharmD students during the spring and fall 2018 semesters. The pilot study was acknowledged as exempt by the Institutional Review Board of West Virginia University. The voluntary nature of the questionnaire, consent in the form of participation, and anonymity was assured prior to the questionnaire being distributed along with the instructions for completion of the questionnaire.

Descriptive statistics were used to describe the study participants. All the items of the questionnaire were evaluated for face validity by the authors. A few minor modifications were suggested to increase relevancy to student pharmacists. The reliability of the constructs was determined using Cronbach-coefficient $\alpha$.

The underlying structure of original scales was confirmed using principal component analysis (SPSS version 25). When the underlying structure was confirmed, we retained the structure and reduced the number of items for each sub-factor. We dropped items that did not contribute to a sub-factor structure and failed to meet the minimum requirement of having a primary factor loading of 0.4 or above and no cross-loading of 0.3 or above. We then selected the items with the highest loadings for each sub factor maintaining the underlying structure of the construct. The Eigen values for all the factors were greater than 1. Significant differences in traits by demographic and other characteristics were determined using t-tests and one-way ANOVA ($p\leq0.05$), and correlations with the dependent variables evaluated by using Pearson coefficient for interval variables and Spearman coefficient for categorical variables. Multiple linear regressions were used to determine the key traits associated with EI and II of the students.

Structural equation modeling (SEM) was conducted using STATA version 15 as a confirmatory factor analysis. It included all the significantly correlated personality traits and background variables with EI and II as dependent variables. All the constructs were included as latent variables measured by
items as the observed variables. The constructs had a direct pathway to the dependent variables. Parameter estimates were obtained using the weighted least squares estimators and standard errors for the indirect effects were estimated using the theta method. Goodness of fit indices included the comparative fit index (CFI) and the root-mean-square error of approximation (RMSEA).

RESULTS

A total of 286 completed questionnaires were received out of 289 total students surveyed. A majority of the students were female, white and were in the age category of 22-25 years. While only seven percent of the respondent students were enrolled in joint degree programs, mostly in MBA, 26% of the students had a family member involved in a business (Table 2).

Factor analysis indicated loading patterns consistent with the theorized factor structure for all the scales. The 10-item modified Rotter’s Locus of Control scale indicated loading on three components with a few items having cross-loadings of above 0.30. Four items were removed that had high cross-loadings and/or low inter-item correlation (<0.20), and providing the best possible Cronbach’s alpha value if that item was deleted. The new scale had six items three items each for internal locus of control and external locus of control. The internal consistency measured by Cronbach’s alpha of the new scale (0.74) was comparable to the original scale (0.77). Similarly, the eight-item Jackson Personality Inventory Manual for innovativeness was evaluated and reduced to three-item new scale with factor loading ranging from 0.93 to 0.97, Eigen value 2.7 and explaining 90% of the variance. The new Cronbach’s alpha value of the scale was 0.82, better than the 0.79 of the original scale. The five-item autonomy scale and three-item risk-taking scale were kept intact as the reduction of even one item was disrupting to the underlying structure of the constructs. The 10-item shortened Bateman and Grant’s Proactive Personality Scale was reduced to a five-item scale with factor loadings ranging from 0.66 to 0.79 and a Cronbach’s alpha value of 0.80 (previous 0.86).

The Work Preference Inventory-10, 15-item people liking scale, and the 21-item leadership self-efficacy scale were reduced to five-item, seven-item, and 12-item scales, respectively. With the reduction
of items, the Cronbach’s alpha for these three scales changed from 0.65 to 0.71, 0.85 to 0.83 and 0.91 to 0.90, respectively. Furthermore, we added three items from the achievement motivation scale to the problem-solving scale because of the similar underlying structure of the factors. So, the three-item scale was increased to a six-item problem-solving scale (Cronbach’s alpha=0.79). The risk-taking scale was only three items and hence it was not modified (Cronbach’s alpha=0.71). The item reduction process facilitated removal of less reliable and redundant items, finally leaving a total of 69-items in the questionnaire (Table 3).

As expected, EI and II scales were found to be unidimensional with excellent Cronbach’s alpha value of 0.95 and 0.91, respectively. The mean score for EI was 3.04, while that for II was 4.05 both with a range from 1-7. The Pearson and Spearman correlations for EI and II was conducted with all the personality traits. Expectedly, the two intentions were highly correlated (Pearson product moment correlation=0.43). Moreover, EI was significantly correlated with autonomy, risk-taking propensity, proactiveness, problem solving, leadership self-efficacy, gender and joint degree program. II was significantly correlated with autonomy, proactiveness, achievement motivation, problem solving, leadership self-efficacy, gender and joint degree program.

We used MLR to identify the key traits associated with EI and II for all student pharmacists. We developed two models namely, the EI model and the II model. We then used mean score of the four items constituting the EI factor and the mean score of the three items constituting II factor as the dependent variables in the two regression models, respectively. The independent variables were the same for each model including the nine personality traits and the demographic and educational variables.

In the EI model (Table 4), leadership self-efficacy, autonomy, and problem-solving personality traits were significantly associated at p<0.05. Additionally, from the demographics and background variables, gender and joint degree programs were significantly associated with EI. Together, all the variables explained 16.8% of the variance.

The results of the II model are shown in Table 4. Leadership self-efficacy, problem-solving, autonomy and achievement motivation were significantly associated with II at p<0.05. The results of the
MLR indicated that the four personality traits explained 18.2% of the variance. Family member involvement in business was not associated with either intention in this study.

We included only seven constructs (variables that demonstrated significant correlations with EI and II) measuring latent personality traits and observed educational and demographic characteristics in SEM (Figure 1). The model demonstrated that gender, joint degree program, and autonomy were significant predictors of EI. Achievement motivation and leadership self-efficacy and problem solving were found to be significant predictors of II. The SEM had goodness-of-fit indices as CFI=0.81 and RMSE =0.63.

DISCUSSION

This pilot study is the beginning of a program of inquiry into identifying and nurturing future entrepreneurs and intrapreneurs in pharmacy. Several new terms including “pharmapreneur,” medipreneur and value trained pharmacists have been increasingly appearing in pharmacy blogs and news in the past two years.41–43 However, the literature regarding these terms has not yet been formally developed/expanded beyond the blogs. Thus, this is the first study to identify associations between personality traits and EI and II and will add some background to these terms in peer reviewed literature.

We followed a rigorous process to develop a 69-item Entrepreneurial-Intraprendeurial Pharmacist Questionnaire (EIPQ) to measure EI and II of student pharmacists and associated personality traits by employing factor analysis, MLR, and confirming the results with SEM.

The EIPQ consists of 11 different constructs with each having acceptable to very good reliability. Mean scores of the students on most personality traits were on the positive side indicating that the students possessed these critical personality traits. The mean scores of the EI and II indicated an overall ambivalence of students towards entrepreneurism or intrapreneurism at the present stage of their careers. The slightly higher mean score for II may suggest that students preferred working within an organization slightly more. This finding is consistent with published literature demonstrating mixed results in the student pharmacists’ intentions towards entrepreneurism with more studies reporting negative
intentions. A study evaluating student pharmacists’ intentions based on theory of planned behavior reported negative beliefs, attitudes and intentions towards pharmacy ownership. In the study, students reported lacking knowledge and skills to become an entrepreneur, which may suggest a problem with the curriculum in pharmacy schools. There may be a need to add or revise the curriculum to make entrepreneurship content and skills more prominent to students. Overall, the students in this pilot study possessed few personality traits associated with becoming an entrepreneur or intrapreneur with greater than 5.0 mean scores on locus of control, leadership self-efficacy, and proactiveness, but unfortunately their mean scores were lowest on risk-taking propensity and innovativeness. This may suggest that students in this specific University may prefer a safe, secure and reliable job setting and are risk averse. Also, this response of the students may be explained by the influence caused by the transition of the role of the pharmacist from an independent pharmacy owner to a more employee-pharmacist role working within an institution or chain pharmacy. Furthermore, with the increased competition for independent pharmacies from large chain pharmacies, shrinking prescription drug margins, fewer owner-pharmacist role models, and stiff regulatory and competitive environment, students may prefer the job safety of working in an institutional or chain pharmacy where such risks directly to them are minimal. Risk aversion among pharmacy students is well documented in the literature. Several studies have provided potential solutions that can be employed to mitigate this problem in pharmacy students. Some strategies include education, active co-curricular activities requiring risk taking behavior from students, and demonstration of risk-taking to the students by conducting seminars with real-life risk-taking entrepreneurs. Elective courses that focus on creative thinking, risk taking and initiating innovative projects may also be helpful.

As established in the literature, we found several traits associated with EI and II overlapping. Research indicates that entrepreneurial and intrapreneurial individuals possess high risk tolerance and aspire for more independence. In this study, we found autonomy to be statistically associated with both EI and II, but autonomy was a stronger predictor of EI as compared to II. However, risk taking propensity was not a significant predictor and that possibly depicts the shift in the role of pharmacists
mentioned earlier. The leadership self-efficacy scale combined leadership and self-efficacy in one scale thereby allowing the measurement of both constructs within one scale.\textsuperscript{37} We found leadership self-efficacy to be a significant predictor of both EI and II. However, it was a stronger indicator of II than EI. Problem solving was found to be a significant predictor of both EI and II. Previous studies have demonstrated that problem solving is a key trait of a person in a leadership position such as an entrepreneur or intrapreneur.\textsuperscript{37,53,54}

Student pharmacists who have enrolled in a joint degree program were found to be more likely to have high EI. Majority of the student pharmacists (93.4\%) pursuing or interested in joint degree programs were enrolled in a joint business degree. This decision suggests a likely inclination towards business or entrepreneurship. Therefore, it is not surprising that the joint degree program is a significant predictor of higher EI. Females were the majority in the study sample consistent with national trends of increased proportion of females entering the profession. They were found to be more likely to have higher EI than males. This is consistent with studies that report that the percentage of females entrepreneurs in pharmacy has increasing significantly.\textsuperscript{55,56}

Distinguishing between students with high EI and II, we found that a student with high achievement motivation is more likely to have higher II. Specifically, a student with high achievement motivation along with leadership and problem-solving traits along with a desire for autonomy will be more likely to have II. The role of achievement motivation is vital in this association since an intrapreneur must go beyond the traditional expected duties and role as an employee pharmacist, deal with the political and resource challenges to explore opportunities and innovate to introduce a new pharmacy service that is not currently being offered. Ross and Unwalla have portrayed the intrapreneurial personality to include motivation to solve problems and being ambitious in nature.\textsuperscript{57} Spinelli and Adams recognize motivation to excel as one of the key aspects of quality of intrapreneurism.\textsuperscript{58} Achievement motivation is also crucial in entrepreneurship, but that motivation arises from the fear of risk of failure of the business. However, for intrapreneurs, the risk is shared with the organization.
The key personality traits identified in the MLR were further confirmed through SEM. Although, leadership self-efficacy and problem solving were not significant for EI and autonomy was not significant for II, SEM was able to confirm all other key personality traits while taking into account the interrelated dependent relationship between EI and II in the model. The covariance of the EI and II could have played a significant role in the model. While MLR is limited to assess one relationship at a time, SEM can efficiently estimate a series of interrelated dependent relationships concomitantly. Additionally, MLR is unable to directly estimate potential relationships in a model that are based on theoretical background and at the same time fit data. SEM is more effective than MLR in developing a parsimonious model because it can evaluate the interaction effects among the variables. Thus, the SEM approach that examines multiple dependence relationships is considered efficient in addressing complicated personality and behavioral issues.

Consistent with the Hermansen-Kobulnicky et al study, we support broadening the horizon of pharmacy education with appropriate inclusion of entrepreneurial awareness and training.\textsuperscript{5} Passing exams and getting residencies seems to be a growing emphasis in pharmacy education. However, without entrepreneurial mindsets students may not be motivated to innovate and create new job opportunities. Entrepreneurship is mostly considered as owning an independent pharmacy store, however, this it is not the only application of entrepreneurial skills in the marketplace. There are opportunities emerging for innovative non-dispensing PCS such as cognitive or consultative services related to chronic disease management and medication therapy management, which in the future may allow pharmacists to become successful entrepreneurs or intrapreneurs.\textsuperscript{59,60} Moreover, pharmacist should start to explore the profession beyond the easily accessible but slowly decreasing corporate jobs where pharmacists have the least autonomy and control of their work.

This study has several limitations. The EIPQ has been tested in only one pharmacy school with a modest sample size and sample variability. The EPIQ needs to be validated for criterion and predictive validity by testing in samples of known entrepreneurial and intrapreneurial pharmacists in both community and institutional settings. It needs further testing in multiple sites across different types (eg,
public/private, geographical regions) and over time longitudinally to determine how predictive the questionnaire is of student pharmacist intentions translating into actions. It is also important to note that EIPQ is designed to identify intentions in students which may not equate with future behavior.

The EIPQ incorporates both, EI and II giving the advantage of measuring student pharmacists’ interest in promoting pharmacy services either independently or as part of a pharmacy organization by using just one questionnaire. The EIPQ also includes key personality traits associated with entrepreneurs and intrapreneurs. This composite measure of EI, II and personality traits facilitates active evaluation of the required personality traits for students possessing EI or II, and identifying specific target traits for strengthening. The information can help faculty members to better understand student pharmacists in terms of their aptitude for entrepreneurial and intrapreneurial activities and proclivity for certain types of projects and assignments. EIPQ can help students to better understand themselves and be self-aware of their inclinations and allow them to better prepare for future entrepreneurial or intrapreneurial ventures of interest. Other potential applications of EIPQ include as a screening tool for admission to the management track courses or aptitude for joint degree programs like the PharmD-MBA, and evaluation of student pharmacists’ EI and II post management courses.

CONCLUSION

A multi-dimensional questionnaire was constructed to measure the intentions of student pharmacists towards entrepreneurship and/or intrapreneurship and identified and confirmed a few key predictors of EI and II among student pharmacists. This survey of EI and II indicates that pharmacy students are ambivalent towards taking responsibility for innovation. When fully validated, the EIPQ may be used in the pharmacy schools for several purposes including PharmD admission process to gain additional insights of student potential to become future innovative entrepreneurial or intrapreneurial practitioners, screening tool to determine aptitude for management tracks or PharmD-MBA programs.
REFERENCES

1. Hata M, Klotz R, Sylvies R, et al. Medication therapy management services provided by student pharmacists. *Am J Pharm Educ*. 2012;76(3):51. doi:10.5688/ajpe76351.

2. Hayes C, Hutchison LC. Development and evaluation of a student-led medicare part d planning clinic. *Consult Pharm*. 2013;28(4):237-242. doi:10.4140/TCp.n.2013.237.

3. Lumpkin GT, Dess GG. Clarifying the entrepreneurial orientation construct and linking it to performance. *Acad Manag Rev*. 1996;21(1):135-172. doi:10.5465/amr.1996.9602161568.

4. Mattingly TJ, Mullins CD, Melendez DR, Boyden K, Eddington ND, Eddington ND. A systematic review of entrepreneurship in pharmacy practice and education. *Am J Pharm Educ*. 2019;83(3):7233. doi:10.5688/ajpe7233.

5. Hermansen-Kobulnicky CJ, Moss CL. Pharmacy student entrepreneurial orientation: a measure to identify potential pharmacist entrepreneurs. *Am J Pharm Educ*. 2004;68(5):113. doi:10.5688/aj6805113.

6. Mueller SL, Thomas AS. Culture and entrepreneurial potential: A nine country study of locus of control and innovativeness. *J Bus Ventur*. 2001;16(1):51-75. doi:10.1016/S0883-9026(99)00039-7.

7. Manion, J. Enhancing career marketability through intrapreneurship. *NAQ*. Dec 2001.25(2):5–10. https://journals.lww.com/naqjournal/Abstract/2001/01000/Enhancing_Career_Marketability_through_4.aspx. Accessed July 8, 2018.

8. Douglas EJ, Fitzsimmons JR. Intrapreneurial intentions versus entrepreneurial intentions: distinct constructs with different antecedents. *Small Bus Econ*. 2013;41(1):115-132. doi:10.1007/s11187-012-9419-y.

9. American Pharmacists Association. Chain Community Pharmacy. APhA Career Pathway Evaluation Program for Pharmacy Professionals. *APhA*. 2013. https://www.pharmacist.com/sites/default/files/files/Profile_06 Chain pharmacy Final 071713.pdf. Accessed July 8, 2018.

10. Hohmeier KC, Gatwood J. Toward intrapreneurship in pharmacy education. *Am J Pharm Educ*. 2016;80(3):53. doi:10.5688/ajpe80353.

11. Schneider DN. A key pharmacy intrapreneural program: ambulatory care. *Top Hosp Pharm Manag*. 1987;6(4):21-29. http://www.ncbi.nlm.nih.gov/pubmed/10314208. Accessed July 8, 2018.

12. Zellmer W. JCPP plans for following up on the conference. Joint Commission of Pharmacy Practitioners. *Am J Heal Pharm*. 2000;57(6). http://www.ajhp.org/content/57/6/596.long?ssocomed checked=true. Accessed July 30, 2018.

13. American Council Pharmaceutical Education. Accreditation standards and key elements for the professional program in pharmacy leading to the Doctor of Pharmacy degree (Standards 2016). https://www.acpe-accredit.org/pdf/Standards2016FINAL.pdf. Published February 2015. Accessed July 30, 2018.

14. Pharmacy and Medically Underserved Areas Enhancement Act - ASHP. https://www.ashp.org/Advocacy-and-Issues/Provider-Status/Pharmacy-and-Medically-Underserved-Areas-Enhancement-Act. Accessed November 1, 2018.

15. Tolle EM, Al Jumali AAA, Catney CM, McDonough RP, Veach S, Doucette WR. A survey of pharmacists’ preparedness for provider status implementation. *Am J Pharm Educ*. 2017;57(3):S284-S288. doi:10.1016/j.ijaph.2017.02.022.

16. Gregory PAM, Whyte B, Austin Z. How do community pharmacists make decisions? Results of an exploratory qualitative study in Ontario. *Can Pharm J (Ott)*. 2016;149(2):90-98. doi:10.1177/1715163516525636.

17. Khan MU, Ahmad A, Fayyaz M, Ashraf N, Bhagavathula A. Exploring the intentions of pharmacy students towards pharmacy ownership by using theory of planned behaviour. *BMC*. 2016;9:183. doi:10.1186/s13104-016-1996-4.

18. Rosenthal M, Austin Z, Tsuyuki RT. Are Pharmacists The Ultimate Barrier To Pharmacy Practice
19. Rosenthal MM, Breault RR, Austin Z, Tsuyuki RT. Pharmacists’ self-perception of their professional role: Insights into community pharmacy culture. *Am J Pharm Educ.* 2011;51(3):363-368a. doi:10.3331/JPhA.2011.10034.

20. Luetsch K. Attitudes and attributes of pharmacists in relation to practice change – A scoping review and discussion. *Res Soc Adm Pharm.* 2017;13(3):440-455.e11. doi:10.1016/j.sapharm.2016.06.010.

21. Willink DP, Isetts BJ. Becoming “indispensable”: developing innovative community pharmacy practices. *Am J Pharm Educ.* 2003. 45(3):376-386;387-389. http://www.ncbi.nlm.nih.gov/pubmed/15991760. Accessed August 5, 2019.

22. Baum JR, Locke EA. The relationship of entrepreneurial traits, skill, and motivation to subsequent venture growth. *J Appl Psychol.* 2004;89(4):587-598. doi:10.1037/0021-9010.89.4.587.

23. Noble C, O’Brien M, Coombes I, Shaw PN, Nissen L, Clavario A. Becoming a pharmacist: Students’ perceptions of their curricular experience and professional identity formation. *Curr Pharm Teach Learn.* 2014;6(3):327-339. doi:10.1016/j.cptl.2014.02.010.

24. Vecchio RP. Entrepreneurship and leadership: common trends and common threads. *Hum Resour Manag Rev.* 2003;13(2):303-327. doi:10.1016/S1053-4822(03)00019-6.

25. Ramia E, Salameh P, Btaiche IF, Saad AH. Mapping and assessment of personal and professional development skills in a pharmacy curriculum. *BMC Med Educ.* 2016;16(1):19. doi:10.1186/s12909-016-0533-4.

26. Van Gelderen M, Brand M, van Praag M, Poutsma E, Van Gils A. Explaining entrepreneurial intentions by means of the theory of planned behaviour. *Career Dev Int.* 2008;13(6):538-559.

27. Gomez-Mejia LR, Balkin DB. Effectiveness of Individual and Aggregate Compensation Strategies. *Ind Relat (Berkeley).* 1989;28(3):431-445. doi:10.1111/j.1468-232X.1989.tb00736.x.

28. Altun İ. The perceived problem solving ability and values of student nurses and midwives. *Nurse Educ Today.* 2003;23(8):575-584. doi:10.1016/S0260-6917(03)00096-0.

29. Bobbio A, Manganelli AM. Leadership self-efficacy scale: a new multidimensional instrument. *TPM.* 2009;16(1):3-24. http://www.tpmap.org/wp-content/uploads/2014/11/16.1.1.pdf. Accessed July 16, 2018.

30. Miller D. The correlates of entrepreneurship in three types of firms. *Manage Sci.* 1983;29(7):770-791. doi:10.1287/mnsc.29.7.770.

31. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp. IBM Corp. http://www-01.ibm.com/support/docview.wss?uid=swg21476197. Published 2017. Accessed August 14, 2019.
40. StataCorp. 2017. Stata Statistical Software: Release 15. College Station. TX: StataCorp LLC. https://www.stata.com/support/faqs/resources/citing-software-documentation-faqs/. Accessed November 9, 2018.

41. How Being a Pharmapreneur Can Change the Pharmacy Industry. Pharmacy Times. https://www.pharmacytimes.com/blogs/pharmacy-podcast-show/0116/how-being-a-pharmapreneur-can-change-the-pharmacy-industry/. Published 2016. Accessed December 1, 2018.

42. The University Of North Carolina Eshelman School Of Pharmacy. Medipreneurs. https://www.medipreneurs.com/. Accessed August 14, 2019.

43. Thielemier, B. 10 Shared Traits of Successful Pharmacist Entrepreneurs. Pharmacy Times. https://www.pharmacytimes.com/contributor/blair-thielemier-pharmd/2016/02/10-shared-traits-of-successful-pharmacist-entrepreneurs/. Published February 4, 2016. Accessed December 1, 2018.

44. Douglas EJ, Shepherd DA. Self-employment as a career choice: attitudes, entrepreneurial intentions, and utility maximization. Entrep Theory Pract. 2002;26(3):81-90. doi:10.1177/104225870202600305.

45. Brown CM, Cantu R, Corbell Z, Roberts K. Attitudes and interests of pharmacists regarding independent pharmacy ownership. Am J Pharm Educ. 2007;47(2):174-180. doi:10.1331/DS25-0970-21X5-8U7.

46. Adamcik BA, Ransford HE, Oppenheimer PR, Brown JF, Eagan PA, Weissman FG. New clinical roles for pharmacists: A study of role expansion. Soc Sci Med. 1986;23(11):1187-1200. doi:10.1016/0277-9536(86)90338-2.

47. Pearson GJ. Evolution in the practice of pharmacy--not a revolution! CMAJ. 2007;176(9):1295-1296. doi:10.1503/cmaj.070041.

48. Cain J. A pharmacy elective course on creative thinking, innovation, and Ted talks. Am J Pharm Educ. 2016;80(10):170. doi:10.5688/ajpe8010170.

49. Caird S. Testing enterprising tendency in occupational groups. Br J Manag. 1991;2(4):177-186. doi:10.1111/j.1467-8551.1991.tb00025.x.

50. Begley TM. Using founder status, age of firm, and company growth rate as the basis for distinguishing entrepreneurs from managers of smaller businesses. J Bus Venturing. 1995;10(3):249-263. doi:10.1016/0883-9026(94)00023-N.

51. Sexton DL, Bowman N. The entrepreneur: A capable executive and more. J Bus Ventur. 1985;1(1):129-140. doi:10.1016/0883-9026(85)90012-6.

52. Douglas E. Individual Intentions towards Entrepreneurship vs. Intrapreneurship. https://eprints.qut.edu.au/15293/1/AGSE_2008_-_Douglas.pdf. Accessed November 24, 2018.

53. Locke EA, Kirkpatrick S. The Essence of Leadership: The Four Keys to Leading Successfully. Lexington Books; 1999.

54. Yukl Gary A. Leadership in Organizations. 6th Edition. Amazon.com: Books;2006. https://www.amazon.com/Leadership-Organizations-6th-Gary-Yukl/dp/B000OHSTYI. Accessed November 24, 2018.

55. Bruni A, Gherardi S. approach BP-A ethnographic, 2005 undefined. Gender and entrepreneurship. content.taylorfrancis.com. https://content.taylorfrancis.com/books/download?dac=C2004-0-30313-X&isbn=9780203698891&format=previewPdf. Accessed July 31, 2018.

56. Fischer E, Reuber AR, Dyke L. A theoretical overview and extension of research on sex, gender, and entrepreneurship. J Bus Venturing. 1993; 8(2):151-168. https://www.sciencedirect.com/science/article/pii/088390269390017Y. Published March 1993. Published Online 2002. Accessed July 31, 2018.

57. Ross JE, Ross JE, Unwalla D, Unwalla D. Who is an intrapreneur? Personnel. 1986;63.

58. Spinelli S, Adams R, Timmons JA. New Venture Creation: Entrepreneurship for the 21st Century.

59. Greer N, Bolduc J, Geurkink E, et al. Pharmacist-led chronic disease management: a systematic review of effectiveness and harms compared with usual care. Ann Intern Med. 2016;165(1):30.
Table 1. Nine personality traits constructs included in the study with validated scale and sample item

| Construct                | Validated Scale                                      | Sample item                                                                 |
|--------------------------|------------------------------------------------------|------------------------------------------------------------------------------|
| Locus of Control         | Rotter I-E Scale<sup>24</sup>                        | My life is determined by my own actions.                                    |
| Innovativeness           | Jackson Personality Inventory Manual (JPI)<sup>25</sup> | I often surprise people with my novel ideas.                                |
| Autonomy                 | Autonomy scale<sup>31</sup>                         | After graduation, I will regulate my own time.                              |
| Risk-taking              | Willingness to Take Risk scale<sup>32</sup>          | I am not willing to take risks when choosing a job or a company to work for.|
| Proactiveness            | Proactive Personality Scale (PPS)<sup>33</sup>       | I excel at identifying opportunities.                                       |
| Achievement motivation   | Work Preference Inventory (WPI-10)<sup>34</sup>       | I am strongly motivated by the recognition I can earn from other people.    |
| People liking            | Filsinger Liking scale<sup>35</sup>                 | Sometimes when people are talking to me, I find myself wishing that they would leave. |
| Problem solving          | Problem-Solving scale<sup>36</sup>                  | I am always successful in solving problems.                                 |
| Leadership self-efficacy | Leadership Self-Efficacy scale (LSE)<sup>37</sup>    | I can successfully manage relationships with all the members of a group.    |
Table 2. Demographic characteristics of study sample (N=286)

|                  | N     | %    |
|------------------|-------|------|
| Total            | 286   | 100.0|
| Sex              |       |      |
| Female           | 175   | 58.5 |
| Male             | 124   | 41.5 |
| Age              |       |      |
| 18-21            | 115   | 38.7 |
| 22-25            | 155   | 52.2 |
| 26 and more      | 27    | 9.1  |
| Race             |       |      |
| White            | 263   | 86.8 |
| Non-white        | 28    | 9.2  |
| Marital Status   |       |      |
| Single           | 258   | 89.5 |
| Married / in relationship | 43 | 14.3 |
| Annual Family Income |   |      |
| Below $30,000    | 215   | 73.9 |
| Above $30,000    | 76    | 26.1 |
| Attending Joint Degree MBA | |      |
| Yes              | 20    | 6.6  |
| No               | 281   | 93.4 |

N: Number of participants; %: percentage of participants

Table 3. Mean, Standard Deviation and Reliability for the personality trait scales included in the study and Entrepreneurial and Intrapreneurial intentions

| Construct                  | No. of items | M (SD)      | Cronbach’s alpha (α) |
|----------------------------|--------------|-------------|----------------------|
| Entrepreneurial Intentions  | 4            | 3.04 (.51)  | .91                  |
| Intrapreneurial Intentions  | 3            | 4.05 (.5)   | .95                  |
| Locus of control           | 6            | 5.36 (.83)  | .74                  |
| Innovativeness             | 3            | 4.23 (1.4)  | .82                  |
| Autonomy                   | 4            | 4.54 (.9)   | .72                  |
| Risk Taking                | 3            | 3.93 (1.23) | .71                  |
| Proactivity                | 5            | 5.12 (.91)  | .80                  |
| Achievement Motivation     | 5            | 4.95 (.93)  | .71                  |
| People Liking              | 7            | 4.86 (1.05) | .83                  |
| Problem Solving            | 6            | 4.78 (.92)  | .79                  |
| Leadership Self-Efficacy   | 12           | 5.34 (.76)  | .90                  |

SD: Standard deviation; Mean on a scale of 1 to 7
Table 4. Association between Entrepreneurial intention and Intrapreneurial intention of the students with personality traits and demographic and educational characteristics

| Predictors                  | B    | SE B | β     | p-value  |
|-----------------------------|------|------|-------|----------|
| **Entrepreneurial Intention** |      |      |       |          |
| Constant                    | 1.42 | .1   | .15   |          |
| Gender                      | -.63 | .17  | -.21  | <.001*** |
| Leadership Self-Efficacy    | .31  | .12  | .15   | .01**    |
| Autonomy                    | .27  | .01  | .16   | .006**   |
| Problem Solving             | .22  | .01  | .13   | .026*    |
| Joint degree program        | -.68 | .33  | -.12  | .039*    |
| **Intrapreneurial Intention** |      |      |       |          |
| Constant                    | -1.56| .73  | .03   |          |
| Leadership Self-efficacy    | .43  | .13  | .21   | .001***  |
| Problem solving             | .25  | .01  | .15   | .011*    |
| Autonomy                    | .23  | .01  | .14   | .017*    |
| Achievement Motivation      | .21  | .01  | .13   | .03*     |

B: Unstandardized beta coefficient; SE B: Standard error coefficient; β: Standardized beta coefficient

***p < .001  **p < .01, *p < .05
Figure 1. Structural equation modeling-The relationship of personality traits, educational characteristics and demographic variables with Entrepreneurial intentions and Intrapreneurial intentions

CFI = 0.81, RMSEA = 0.064; $\chi^2$ (1042) = 2348.93, p < 0.001 (Bold line: significant predictors)