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A global study on job and career satisfaction of early-career pharmacists and pharmaceutical scientists

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ABSTRACT

Background: Job and career satisfaction of early-career pharmacists and pharmaceutical scientists is imperative to ensure a motivated and effective workforce, and a secure future for pharmacy practice. In turn, this enables planning, deployment and long term implementation of global imperatives, through universal pharmacy coverage.
Objectives: This study used data from a global survey to determine the level of job and career satisfaction and identify factors that are most significant in determining satisfaction in early-career professionals.
Methods: A cross-sectional survey was distributed to members of the International Pharmaceutical Federation (FIP) Young Pharmacists Group (YPG) via email and social media platforms from November 2019 to May 2020. A previously validated questionnaire using 5-point Likert scales was used. Data were analysed by exploratory factor analysis, using principal component analysis, oblique rotation, and reliability testing of identified components, followed by a comparative statistical analysis.
Results: A total of 1014 respondents from 92 countries participated in this study. Regions of domicile significantly affected job satisfaction ($p = 0.004$) and career satisfaction ($p < 0.0001$) scores. Pharmacists working in community pharmacies perceived lower job satisfaction measures compared to those who work in academic institutions ($p < 0.0001$) and industry sector ($p = 0.012$). There is a negative association between career expectations and job satisfaction and career satisfaction scores. The workplace climate is related to education and training opportunities, lower reported workloads, greater autonomy, and more remuneration.
Conclusion: This was an international study of early-career pharmacists and pharmaceutical scientists. Enhancing factors associated with job and career satisfaction is essential to support early-career pharmacists and pharmaceutical scientists in obtaining fulfilment and esteem in their chosen careers. Developing and implementing a well-framed system that provides a conducive working environment, remuneration, and greater autonomy could improve job and career satisfaction. This study provides evidence to support investment in early-career training, stated in the FIP Development Goal 2.

1. Introduction

The attainment of better health for all is dependent on effective primary health care (PHC).[1] Access to healthcare services and achieving universal health coverage (UHC) depends on enabling equitable population access to a well-educated, trained and motivated health care workforce. In pharmacy, this is dependent upon universal pharmacy coverage. Effective deployment of the health care workforce relies on understanding the state of the workforce in each nation: its quality, accessibility and availability.[2] In most countries worldwide, pharmacists are known as an easily accessible, community-based health care workforce for getting expert health advice.[3] Therefore, it is vital to understand the nature and magnitude of factors that allow pharmacists to operate optimally so that the best services can be delivered to the community.[3]

Job and career satisfaction have been positively linked with motivation, performance, productivity, patient safety and tied negatively to absenteeism, unpunctuality, dissatisfaction towards management and support.[4] Job satisfaction and career satisfaction are two intertwined concepts but with different meanings.[5] Job satisfaction refers to an employee's feeling of accomplishment or a gratifying emotion felt as a result of their job experience or their relationship with their employer; it relates to an individual's perception of their current job-specific experience.[5–11] Career satisfaction, on the other hand, relates more to an individual's career trajectory and their overall satisfaction with the quality of their chosen career path and its relationship with their overall quality of life[10]; career satisfaction represents individuals' attitudes towards their selected professions, which stem from accumulated work experiences and activities relating to their career choices over a long term.[5–11] For example, in a New Zealand study, pharmacists were found significantly less satisfied with their job compared with other healthcare professional groups such as physicians and surgeons.[12] Low job satisfaction may lead to a reduction in productivity and increased staff turnover.[13]

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It can also be linked to 'burnout' which may affect staff performance in providing services.[14]

Research has found age differences in pharmacists' satisfaction and dissatisfaction with their work.[4] In studies in India[15] and Australia,[16] the satisfaction level of young pharmacists was lower than their senior colleagues.[15,16] The limited experience of early-career pharmacists compared to their colleagues might shape their values and expectations; this might influence their satisfaction or dissatisfaction with their job and career.[6] A report launched by the Global Health Workforce Network Youth Hub highlighted a range of critical areas that impact the working condition of youth, including remuneration, safe working environments; equal opportunity and access to employment, and burnout, which are issues experienced more frequently by youth, students and young professionals.[17] This report highlighted that most of the literature focuses on nursing and medicine with limited evidence for early-career pharmacists and pharmaceutical scientists. Similarly, while research on work satisfaction has been done in other healthcare professions such as nursing and medicine,[18,19] research on what constitutes satisfaction at work for early-career pharmacists and pharmaceutical scientists has not been explored. Furthermore, the International Pharmaceutical Federation (FIP) launched the FIP Development Goals (FIP DGs) in 2020 as key resources to transform the pharmacy profession nationally, regionally and globally. FIP DG number 2: Early career training strategy is about developing training strategy and infrastructure to support early-career pharmacists and pharmaceutical scientists. This also includes providing evidence and data to support investment in early-career training.[20] It is, therefore, essential to understand the factors that affect the job and career satisfaction of early-career pharmacists and pharmaceutical scientists. The FIP Young Pharmacists Group (FIP YPG) initiated a study to investigate the level of job and career satisfaction of early-career pharmacists and pharmaceutical scientists worldwide.

Early-career pharmacy and pharmaceutical science professionals are individuals at the beginning of their careers, who are typically up to 35 years of age and mostly within five years of graduating from their degree[21] or with up to 10 years of experience in the profession.[22] Pharmacist and pharmaceutical scientist roles may span from drug development and discovery, to quality control, fundamental research, drug regulatory, drug dispensing, patient education and counselling, hospital/pharmacy administration and community services.[23,24] In addition, pharmaceutical scientists can be involved in the discovery, development, manufacturing, regulation, and utilisation of medical products.[25]

The FIP YPG is a network of motivated early-career pharmacists and pharmaceutical scientists within FIP, an international federation representative of more than four million professionals from the pharmaceutical sector.[21] In 2019, the FIP YPG established a connection with national and regional YPGs to work collaboratively to gather information on the job and career satisfaction of early-career pharmacists and pharmaceutical scientists in their respective countries. This study aimed to assess the job and career satisfaction of early-career pharmacists and pharmaceutical scientists worldwide and identify factors contributing to job and career satisfaction. It is hoped that the findings from this study will be able to identify specific challenges of this early-career group and consequently provide evidence to support policy development on youth and decent work in the health and social care sector,[17] to achieve Sustainable Development Goals number 3: Good health and wellbeing and number 8: Decent Work.[26] Moreover, in the pharmacy profession, this study is hoped to support the improvement of early-career foundational education and training, to achieve the FIP DG number 2: Early career training strategy, which is another specific global imperative highlighted by the WHO Human Resources for Health strategy.[20,27]

2. Methods

2.1. Survey development

An online questionnaire was developed based on pre-existing questions drawn from the literature with some language modifications (see Table A1 of the Appendix).[28–33] The items were discussed within the project team, and some language modifications were carried out to ensure sentences were simple and understandable. For example, the initial wording of a question in the existing questionnaire[29] was: "I determine the pace at which I work". This was rephrased to: "I determine the speed at which I work". Language modification was also conducted to provide more context to the question; for example, initial wording[31] was: "I determine the extent to which I provide a "pharmaceutical service"; this was rephrased to: "I determine the extent to which I provide a "pharmaceutical service" (a service determined by your current job)."

In the first part of the online questionnaire, the respondents were asked to complete demographic data and their work-related information. Following that, the participants were asked to rank 39 statement items on a five-point Likert scale with anchor points from 'strongly disagree' to 'strongly agree' on perceptions of aspects of their work attitudes and career expectations. At the end of the questionnaire, the respondents were prompted with an open-ended question on what could improve their professional work satisfaction and a multiple response question on their reason for studying pharmacy.

The survey was pilot tested with 23 national YPG leaders, with some minor wording adjustments (see Table A2 of the Appendix). For example, in the demographic section, the initial wording of the question of "How would you describe your current employment status?" was modified to "What would be the nearest description of your current sector of work/employment?" with an additional option to include "non-governmental organisation" in the selection. Another example of the minor wording adjustment in the question item was the rephrasing of: "The idea of spending the remainder of my working life in a job like my current one is depressing" to "The idea of staying in my current job for the rest of my life is depressing" to make the sentence simpler and clearer.

The survey was originally developed in English language, and it was translated into five languages: Arabic, French, Indonesian, Portuguese and Spanish. The translation process was conducted through forward and backward translation by bilingual translators. The comparison between backward translation and the English version was discussed within the project team, and any discrepancies were discussed and resolved within the project team and the translators.

2.2. Data collection

The target population of this survey was early-career pharmacists and pharmaceutical scientists around the world. An internet-based sample was deemed appropriate considering the unavailability of a sampling frame and the geographical limitations of the target population. The online survey was made available to all FIP YPG members via email and newsletter from November 2019 to May 2020. In addition, the survey was distributed through social media platforms (Facebook, LinkedIn, Twitter, Instagram) and through FIP YPG's national/regional YPG networks, with whom contact was made at the beginning of the survey, via email and by tagging their social media accounts on reminder posts. This survey distribution strategy was utilised to obtain responses from early-career pharmacists and pharmaceutical scientists beyond FIP YPG members. A reminder was sent every two weeks. Since the population targeted was early-career pharmacists and pharmaceutical scientists who were active on social media or reachable via email, and these data were unknown; it was not possible to calculate the response rate in this study.

2.3. Data analysis

The data were quality checked and cleaned before analysis by looking at typing errors and automated code errors via examination of standard frequency processes. The analysis was conducted using Statistical Package for the Social Sciences (SPSS) Version 26. Principal components analysis (PCA) and oblique rotation (oblimin method) was used to determine the latent components extracted from the 39 item statements. Following factor analysis, negative statements in the questionnaire were reverse coded to calculate the extracted component scores. The component scores were used in subsequent analysis as a composite measure to provide

generalisable insight into job and career satisfaction across sample demographics.

The suitability of the data for factor analysis was determined using the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO > 0.6 is considered acceptable for subsequent PCA) and Bartlett's test of sphericity ($p < 0.05$).[34] Kaiser's criterion was used to determine components for extraction, in which only factors with an eigenvalue of 1.0 or more are retained. Components were labelled by assessing the items within the factors and identifying the common themes. The research team agreed on these labels after reviewing the content of the statements within each factor. Cronbach's α test was calculated for the reliability testing, with reference range of ≥0.7 as an indicator of reasonable internal consistency reliability.[35]

Comparisons by demographic factors were tested using analysis of variance with post hoc testing. A general linear model (GLM) univariate analysis was conducted to examine the interaction between demographic variables and components, such as to identify interaction between gender and the regions of domicile on job satisfaction scores. In addition, multiple linear regression analysis was applied to describe a job satisfaction model based on this sample data.

2.4. Ethical considerations

The study was approved by the UCL Research Ethics Committee, Project ID Number: 16841/001. The online questionnaire was anonymous and non-traceable, and participants were assured that non-participation would have no implications on their ongoing employment. All anonymised data were stored in a password-protected database. Participation was voluntary, and participants provided their consent by entering the survey on the first page.

3. Results

3.1. Sample profiles

The survey received 1014 respondents from 92 countries, which were included in the analysis. Thirty-two per cent ($n = 321$) of respondents were male and 67% ($n = 678$) female; the remainder selected the "prefer not to say" option ($n = 15$). The respondents had an average age of 29 ± 3.9 years (Range 20–49). More than a quarter of respondents resided in the Southeast Asia region ($n = 284$, 28%). A Bachelor's degree was the highest education qualification for 52% ($n = 524$) of respondents. The principal employment categories of practice were community pharmacy ($n = 344$; 38%), hospital pharmacy ($n = 226$; 22%), pharmaceutical industry ($n = 182$; 18%) and academic pharmacy ($n = 92$; 9%). 'Other' categories of employment included government agency, regulatory agency or affairs, non-governmental organisations.The participants' demographic data can be seen in Table 1.

Table 1
Demographic profile of participants.

	Study respondents
Age (years)	
20–24	128 (13%)
25–30	592 (58%)
31–35	246 (24%)
36–40	42 (4%)
More than 40	6 (1%)
Mean ± SD	29 ± 3.9
Gender	
Male	321 (32%)
Female	678 (67%)
Prefer not to say	15 (1%)
The WHO region of country domicile	
Africa region	253 (25%)
America region	149 (15%)
Eastern Mediterranean region	74 (7%)
Europe region	163 (16%)
Southeast Asia region	284 (28%)
Western Pacific region	91 (9%)
Principal employment categories	
Academia	92 (9%)
Community pharmacy	344 (34%)
Hospital pharmacy	226 (22%)
Pharmaceutical industry (include marketing and wholesale pharmacy)	182 (18%)
Other	170 (17%)
Registration qualification	
Bachelor's degree	524 (52%)
Master's degree	263 (26%)
Doctoral degree	29 (3%)
PharmD	198 (19%)
Type of sector	
Public sector	283 (28%)
Private sector	679 (67%)
Non-governmental organisation	52 (5%)
Job duration in the current workplace (months)	
Range	0–196
Mean ± SD	25 ± 28.58
Hours per week	
Less than 20 h a week	122 (12%)
21–40 h a week	410 (41%)
41–48 h a week	313 (31%)
More than 48 h a week	163 (16%)

3.2. Identification of factors

Factor analysis (FA) results showed the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.915 (meeting the common statistical recommendation of >0.6). Bartlett's test of sphericity was significant ($p < 0.0001$), indicating adequacy of the data for FA. The extraction communalities were all above 0.31, indicating adequate shared item and model variance within the data set. All 39 items were entered for PCA before rotation with the scree plot indicating the presence of eight factors with eigenvalues exceeding 1, explaining a total cumulative variance of 60.5%.

Following oblique rotation and examination of component factor loadings (excluding loadings <0.3), the identified factors were: "job satisfaction", "career satisfaction", "workload", "opportunities for training and education", "remuneration", "autonomy", "career expectation" and "work climate". Reliability testing provided Cronbach's alpha ranging from 0.72 to 0.87, indicating a good overall level of consistency and reliability of the factors. Statistical details for the extracted factors and reliability scales can be seen in Table 2. All factor scale scores were normally distributed. This paper focuses on the first and second components: the job and career satisfaction components.

3.3. Job and career satisfaction level across respondents' demographics

An analysis of variance with post hoc testing revealed that regions of domicile significantly affected both job ($F = 3.59$, $p = 0.004$) and career satisfaction scores ($F = 6.70$, $p < 0.0001$). Pharmacists in the Eastern Mediterranean region felt significantly less satisfied with their job compared to pharmacists in Europe ($p = 0.024$) and the Southeast Asia region ($p = 0.009$) (see Fig. 1). There was a non-significant interaction effect between gender and the regions of domicile on job satisfaction scores. However, looking specifically at the female category, it was found that female pharmacists in the Eastern Mediterranean region felt significantly less satisfied with their job compared to female pharmacists in the Southeast Asia region ($p = 0.043$). Looking at other components which may influence job satisfaction extracted from factor analysis above, it was found that pharmacists in the Eastern Mediterranean region had higher career expectation than pharmacists in Southeast Asia ($p = 0.015$), and they had fewer opportunities for education and training than pharmacists in Europe ($p < 0.0001$).

Pharmacists in the Eastern Mediterranean region felt significantly less satisfied with their career compared to pharmacists across Africa ($p < 0.0001$), the Americas ($p = 0.014$) and the South East Asia region ($p = 0.003$). On the other hand, pharmacists across the Africa region felt significantly more satisfied with their careers than pharmacists in Europe

Table 2
Factors yielded from questionnaire items.

Factor	Questionnaire items	Cronbach's α score	Mean ± SD (Range)
Factor 1: Job satisfaction	I get a feeling of accomplishment from my job. All things considered, I am satisfied with my current job. The idea of staying in my current job for the next five years is depressing. I often leave work with a bad feeling, a feeling that I am doing something which I do not enjoy. I have a good professional relationship with my immediate manager or supervisor. My current job seems to have a negative effect on my social and family life.	Six items; α = 0.84	19.84 ± 5.13 (6–30)
Factor 2: Career satisfaction	Knowing what I know now, if I had to decide all over again whether to go into pharmacy, I would choose another field. If I had a son who told me he was interested in pursuing a career in pharmacy, I would encourage him. If I were free to pursue any type of career I wanted, I would stay in pharmacy. If I had a daughter who told me she was interested in pursuing a career in pharmacy, I would encourage her.	Four items; α = 0.87	13.95 ± 4.03 (4–20)
Factor 3: Workload	My job requires concentration for a long time, and it is energy consuming. I'm overloaded with too much responsibility and always" on stand-by" (readiness for duty). My job demands immediate and frequent decisions. I have too much paperwork and administration. I have too much to do at work	Five items; α = 0.77	18.99 ± 3.54 (5–25)
Factor 4: Opportunities for education and training	I have the opportunity to attend training courses I need. I have the opportunity to learn new skills I need. Selection for training is done fairly and equally. I often find out about training events too late to apply. I have been given sufficient training to do my job effectively.	Five items; α = 0.83	15.77 ± 4.33 (5–25)
Factor 5: Remuneration	I feel I am being paid a fair amount for the work I do. I feel satisfied with my chances for salary increases. I feel unappreciated by the organisation when I think about what they pay me. I am satisfied with the salary I receive.	Four items; α = 0.80	11.05 ± 3.82 (4–20)
Factor 6: Autonomy	I determine the speed at which I work. I have sufficient freedom to use my own judgement in my job I am allowed a sufficient amount of freedom to decide how I do my work I determine the extent to which I provide a "pharmaceutical service" (a service determined by your current job) I can clearly see what impact I am making on my "clients" (patients/services/costumers)	Five items; α = 0.76	17.59 ± 3.64 (5–25)
Factor 7: Workplace climate	There are few rewards for those who work here. I have a good work environment in which to do my job. Number of staff at my workplace are adequate/appropriate. I have all the resources I need to do my job properly. I believe the overall "delivery of care" (care or service that I give to clients as appropriate for your current job) is excellent.	Five items; α = 0.72	15.26 ± 3.91 (5–25)
Factor 8: Career expectation gap	Many of our rules and procedures make doing a good job difficult I feel undervalued – by my patients or clients as appropriate for my current job- as a pharmacy professional. I feel undervalued – in my workplace - as a pharmacy professional. My job role is not what I expected it to be after I had graduated/ registered as a pharmacist. I am often disappointed in my day to day role as a pharmacist.	Five items; α = 0.82	15.84 ± 4.52 (5–25)

($p = 0.004$) and the Western Pacific region ($p = 0.022$) (see Fig. 1). There was a non-significant interaction effect found between gender and the regions of domicile on career satisfaction scores. However, it was found that mean career satisfaction differs significantly across regions in male ($p = 0.003$) and female respondents ($p = 0.006$). Male and female respondents in the Eastern Mediterranean region perceived a lower career satisfaction than male ($p = 0.002$) and female respondents ($p = 0.036$) in the Africa region. In addition, male pharmacists in the Eastern Mediterranean region felt significantly less satisfied with their careers than pharmacists in the Western Pacific region ($p = 0.046$).

There was a significant difference across the principal employment categories of practice on the job satisfaction component ($F = 6.06$, $p < 0.0001$). On the other hand, there was no measurable difference in the career satisfaction component. Pharmacists working in community pharmacy report statistically significantly lower job satisfaction compared to those who work in academic institutions ($p < 0.0001$), the industry sector ($p = 0.012$), and 'other' ($p = 0.013$) (see Fig. 2). Looking at other components which may influence job satisfaction, it was found that pharmacists working in academic institutions had greater opportunities for education and training ($p = 0.008$) but lower career expectations ($p = 0.014$) than pharmacists working in community settings.

There was a non-significant interaction effect found between gender and the principal employment categories of practice on job satisfaction scores. However, there was a significant main effect of principal employment categories of practice ($p = 0.001$) on the job satisfaction scores. Looking at the gender categories independently, it was found that female pharmacists working in community-based settings have significantly lower job satisfaction compared with female pharmacists who work in academic institutions ($p = 0.029$) and the industry sector ($p = 0.006$). There was a significantly higher career satisfaction score in those with bachelor's degrees compared to those with masters-level degrees $F = 4.025$, $p = 0.032$. When comparing the job and career satisfaction scores across the reasons for studying pharmacy, the highest job and career satisfaction scores were found in those who chose pharmacy because of their family pharmacy business. Those who chose pharmacy because of an 'intention to migrate abroad' were found to have lower job satisfaction than most of the other reasons.

3.4. Multiple regression to explore a model of factors influencing job satisfaction

Multiple linear regression analysis determined the overall relationships between the independent factors and demographics influencing job satisfaction (as the dependent variable). Seven variables accounted for 59.4% of the variance using an 'entry' model for linear regression analysis, $F = 173.52$, $p < 0.0001$. The standardised regression coefficients indicated that 'career expectation' and 'workplace climate' factors have the most impact on job satisfaction, whereby job satisfaction was negatively affected by 'career expectation' and positively affected by 'workplace climate'. The overall model can be seen in Fig. 3.

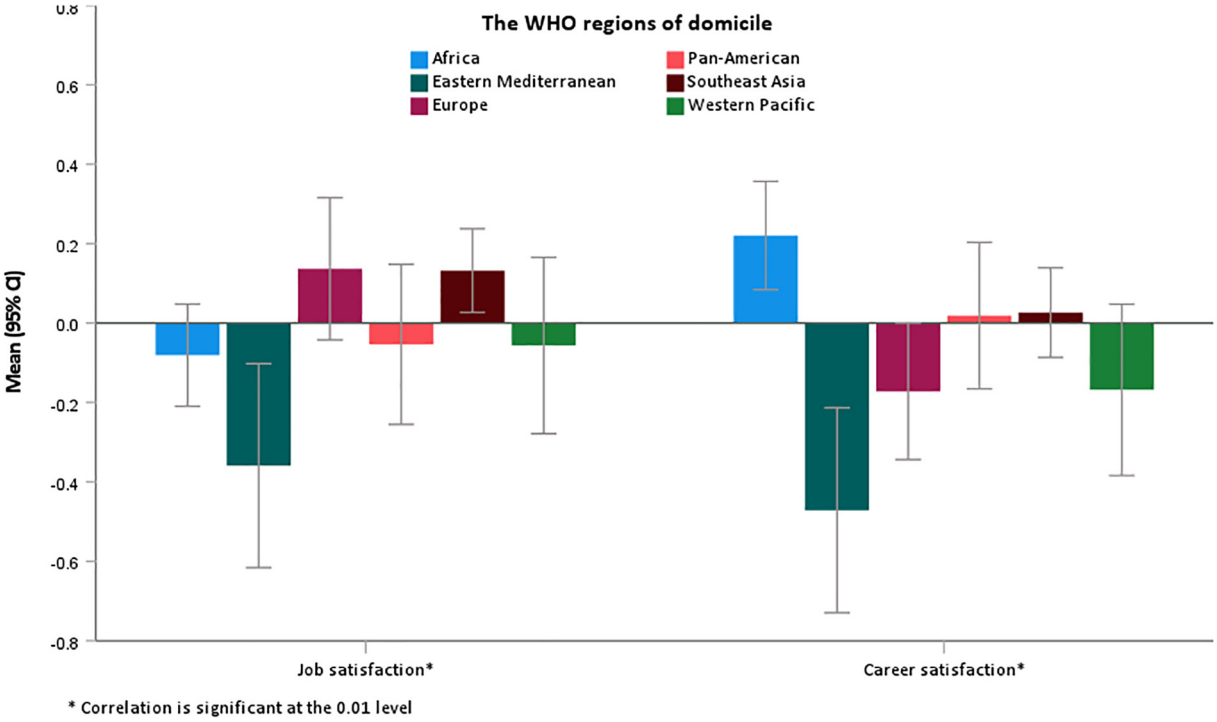

Fig. 1. Comparison of both job and career satisfaction components across regions of domicile.

4. Discussion

This research is the first known publication that has evaluated job and career satisfaction globally specific to early-career pharmacists and pharmaceutical scientists. Job satisfaction in pharmacy professionals and pharmacy students has been well studied; while career satisfaction has also been studied in this population, there is less extensive evidence of this in the existing literature. In addition, most of the research on job and career satisfaction have been conducted at facility and country level and in a general sample of the pharmacy population,[4,5,15,16,28,36–40] while this study focused on the early-career level and comparison across countries. On an aggregate level, the majority of pharmacists and pharmaceutical scientists surveyed were satisfied with their current job and careers. These results align with previous studies conducted at country level of a general sample of pharmacists.[16,28,36–40]

This study found that country of domicile affects relative job and career satisfaction measures. This finding supports evidence from a previous observation[41] that job satisfaction levels in a general sample of populations differed across countries.[41] Cultural differences might have affected job and career satisfaction levels in the surveyed sample. Pharmacists across the Eastern Mediterranean region felt significantly less satisfied with their job and career than pharmacists in other regions. Further investigation across regions on the factors contributing to job and career satisfaction should be undertaken.

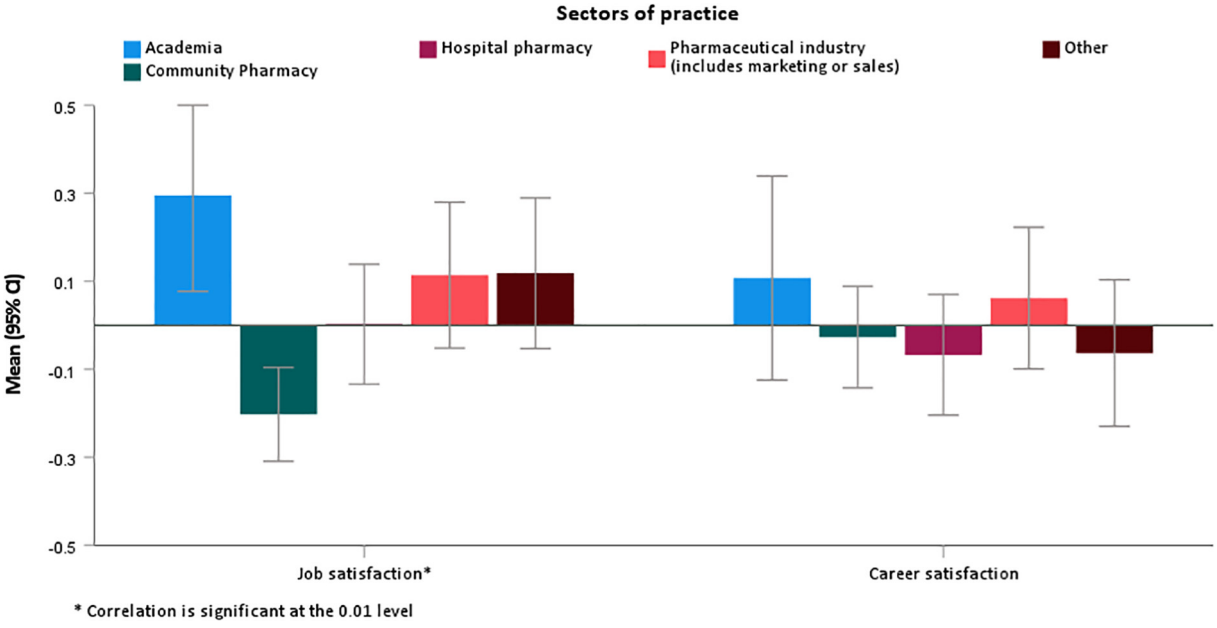

Fig. 2. Comparison of both job and career satisfaction components across the principal employment categories of practice.

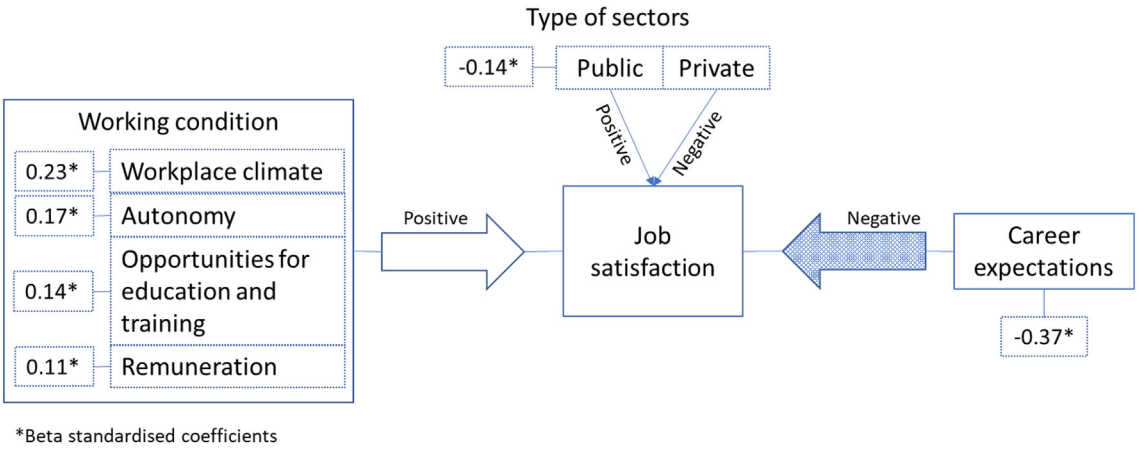

Fig. 3. Model of factors influencing job satisfaction.

The setting of practice has also been shown to have an influence on job satisfaction. This study supports evidence from previous studies conducted in the United States[42] and in Amman,[43] in which pharmacists working in hospital settings had greater job satisfaction than those who work in community settings. This may be because pharmacists working in community settings had greater expectations of where they could apply their professional skills.[43] Further analysis is needed to discover work-related characteristics that impact job and career satisfaction in community settings to identify ways to increase satisfaction and retention.

With career satisfaction being linked to long-term experiences across different jobs and different sectors,[5,10] it would be expected that with greater opportunities to advance in education,[44] the more educated respondents to this study would exhibit greater career satisfaction. Surprisingly, respondents with bachelor's degrees had greater career satisfaction than those with masters-level degrees. This reported finding could be the result of level of experience or perceived understanding of their career trajectory, for individuals with bachelor degrees who reported greater career satisfaction. More research is needed to further investigate the factors contributing to the greater career satisfaction of respondents with bachelor's degrees, again to secure the workforce longer term.

Another finding from this study was that pharmacists who chose to study pharmacy because of their family pharmacy business were found to have higher job satisfaction. On the contrary, pharmacists who chose to study pharmacy with an intention to migrate abroad were found to have lower job satisfaction compared to the other reasons for studying pharmacy. This study is consistent with previous studies that reported that motivation is one factor that influences job satisfaction.[38,45] Further study to explore in-depth the correlation between studying pharmacy and how it affects job and career satisfaction is encouraged.

Although gender has previously been shown to be a determinant of job satisfaction, this study did not find a significant difference between genders in the sample.[4,5,16,37,44] This may be because of an unequal sample of males and females. Typically, female pharmacy professionals demonstrate greater job and career satisfaction than their male counterparts despite reporting less remuneration and less opportunities for career advancement than their male counterparts.[5,37,44] Further investigation of gender differences in job and career satisfaction on a global scale would aid in the development of tailored policies dependent on outcomes for each gender, and which would ensure equity in the job and career experiences across genders.

This study revealed that improvement in education and training, remuneration, and workforce climate is linked to job and career satisfaction. This study is consistent with previous studies that reported that working environment and income influence job satisfaction.[38,45] Career satisfaction was also found to correlate with perceived autonomy, in which greater autonomy will increase career satisfaction. There is evidence of a strong association between greater autonomy and job satisfaction,[46] because when employees have greater autonomy, they will be more satisfied with their job and career. Specific for the early-career group, the autonomy needs to be linked with regulation, in which regulation tends to be restrictive, but balances with patient safety are paramount in early-career experiences. This study also found that career satisfaction has a negative correlation with career expectations. The bigger the expectation of early-career pharmacists and pharmaceutical scientists, the less satisfied they are in their careers. Considering this study was conducted cross-sectionally, it may be interesting to conduct a longitudinal study to explore the relationship between career expectations and career satisfaction and how career expectations and satisfaction change over their careers.

This study highlighted that more opportunities for education and training, better stewarding of career expectations (and hence practice development), better policy formation for public and private service provision, and labour force working conditions (including employment climate) are associated with job satisfaction for early-career pharmacists and pharmaceutical scientists. The identification of factors that correlate with job and career satisfaction in this study sample could support policy development to address these areas. Enabling policy development on these factors is important because if early-career professionals are dissatisfied with their jobs and careers, there is a possibility of the pharmacy profession suffering from the long-term implications and a risk of shortages due to a high attrition rate. High attrition rate due to job dissatisfaction has been reported previously in studies conducted for hospital pharmacists.[16,47,48]

4.1. Limitations

This study had some limitations. First, job satisfaction is a subjective issue, which is dependent on different interpretations by different people and may fluctuate over time, depending on the individuals' feeling and environment at the point of time. It is not possible to standardise satisfaction as a variable fully. The use of self-administered questionnaires may also not truly reflect respondents' actual feelings and thoughts. Second, the factors affecting job and career satisfaction were already pre-determined as part of the survey design; thus, there may be other factors related to satisfaction that have not been included and assessed in the survey. Third, this study had 1014 participants who may not be a representative sample of early-career pharmacists and pharmaceutical scientists worldwide, considering different countries have different perceptions of work culture and varying legislation. Also, while the target samples were pharmacists and pharmaceutical scientists, the proportion of pharmacists and pharmaceutical scientists was unknown. In addition, there may be bias towards some countries due to unequal sample respondents across countries. Lastly, the data were collected during and concurrent with the onset of the COVID-19 pandemic, therefore, there might be possibilities that the pandemic situation affected

how participants perceived their job and career satisfaction. The pandemic brought on severe mental health impacts and unprecedented job losses, as well as delays in significant career milestones for individuals globally.[49,50] Hence respondents to this study may have had altered perceptions about their job and career satisfaction which may not have been the case had the data been collected pre-pandemic. However, this study has provided thought-provoking results, which are useful for future research and aiding the implementation of policies to improve satisfaction levels for early-career pharmacists and pharmaceutical scientists.

5. Conclusion

This study examined the level of job and career satisfaction and associated factors specific to early-career pharmacists and pharmaceutical scientists. As the future generation of pharmacists and pharmaceutical scientists, it is important to understand the factors that affect their job and career satisfaction for the sustainability of pharmaceutical care services. Job and career satisfaction is positively influenced when there are more opportunities for education and training, better workplace climates, greater autonomy and remuneration. Having more opportunities for education and training in their early-career will improve job satisfaction. Based on the findings, it is also important to ensure equal opportunities are provided for education and training, considering gender and diversity balances. Conducting education and training can be achieved through collaboration with national professional organisations, universities and global organisations such as FIP through the FIP Young Pharmacists Group (FIP YPG). The FIP YPG conducts several activities to support early-career pharmacists and pharmaceutical scientists; the remote volunteering and leadership development programmes open up opportunities for education and training[51] and their recent publication, a career development toolkit[52], guides early-career practitioners to progress in their careers.

Developing and implementing a well-framed system that provides a conducive working environment, remuneration, and greater autonomy will also lead to improved job and career satisfaction for early-career pharmacists and pharmaceutical scientists. It is important to advocate for decent working conditions for early-career practitioners. This can be done through campaigns and advocacy activities with professional associations and youth organisations. Stakeholder engagement, in particular with policymakers, can be done to support the implementation of the decent work policy agenda. Considering the variety of levels of job and career satisfaction across regions, further analysis can be carried out to conduct an in-depth investigation of job and career satisfaction levels in each region. This analysis could become evidence to support policy papers advocating for the decent work policy agenda and the FIP Development Goal 2: Early career training strategy.

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CRediT authorship contribution statement

Sherly Meilianti: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Data curation, Writing – original draft, Visualization, Project administration. **Ayodeji Matuluko:** Methodology, Data curation, Writing – original draft, Project administration, Writing – review & editing. **Nazifa Ibrahim:** Formal analysis, Writing – original draft. **Nilhan Uzman:** Writing – review & editing. **Ian Bates:** Conceptualization, Methodology, Validation, Formal analysis, Visualization, Writing – review & editing, Supervision.

Declaration of Competing Interest

The authors declare that they have no competing interests.

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Appendix A. Supplementary data

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