





Career Readiness Among Saudi Pharmacy Students: Exploring the Need for and the Impact of Career Counseling Services

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Purpose: Employers place emphasis on graduates' work experience and interpersonal skills while academia mainly focuses on developing students' learning ability. One proposed strategy is through career guidance by universities; however, supportive evidence is lacking. This study explored the career readiness of pharmacy students for the Saudi job market. It also examined the availability of career guidance services for pharmacy students and alumni in Saudi Arabia and the impact of such services on recipients' career path choices and development of competencies.

Subjects and Methods: This cross-sectional study utilized an online-based survey. Pharmacy students in the last three years of their program and recent graduates participated in the survey. The study used descriptive statistics to describe participants' demographic data. Respondents were asked to rate aspects related to career readiness on a 5-point Likert scale, and their responses were reported as frequencies with percentages or means as appropriate. Comparisons between groups were made using *t*-test or one-way ANOVA as required.

Results: A total of 576 responses were collected. About 25% of participants acknowledged the career guidance services provided at their pharmacy college, whereas the majority indicated that they have never reached out to a career counselor at their university (89.6%). The highest level of disagreement was noticed in impact of career guidance services on participants' establishment of their CV/portfolio (50.7%). Using the work readiness scale, the lowest mean was seen in the social intelligence domain (3.64 ± 0.94).

Conclusion: Although substantial proportion of students reported the presence of career guidance services in their university or college, very few stated that they had utilized such services. This could have impacted the students' career readiness for the rapidly changing Saudi job market. Therefore, proper measures to advertise the availability of career guidance services in Saudi pharmacy schools have to be implemented.

Keywords: career readiness, pharmacy students, career guidance services, impact, Saudi Arabia

Introduction

As the numbers of pharmacy graduates in Saudi Arabia (SA) increase, the percentage of Saudi pharmacists working in the government and private health care sectors in the country also increased from 22% in 2016 to 35.2% in 2020.¹ Currently, the pharmacist density is 9 per 10000 population in SA compared with the global average of 5.09.^{1,2} Saudi Vision 2030 aims to advance health care, broaden access to medical services, and digitize health care services,³ and these developments will require more pharmacists to be employed in the future.

The job market for Saudi pharmacists is wide open. Opportunities include working in hospital pharmacies, community pharmacies, or the pharmaceutical industry. The number of Saudi pharmacists is expected to increase even more rapidly in response to the country's efforts to nationalize its private sector manpower. The Saudi Food and Drug Authority and General Organization for Social Insurance (GOSI) announced the Saudization of all promotional jobs in pharmaceutical companies, factories, and associations in November 2018. This regulation entailed that all vacancies were to be occupied by Saudi

pharmacists by the end of 2020.⁴ Similarly, GOSI, with the cooperation of the Ministry of Health, called for the Saudization of 50% of all pharmacy-related jobs by the third quarter of 2021.⁵ Due to these changes, community pharmacies, appear to be the employer in the private sector with the greatest number of job opportunities.^{6,7} According to Almaghaslah et al,⁸ 57% of Saudi pharmacists work in community pharmacies, a rate that appears to be moving toward the general pattern worldwide, where most pharmacists work in community pharmacies (75%).² Interestingly, this is considered to be the least favorable career path for Saudi pharmacy graduates.⁷ This might be attributed to graduates' lack of career readiness which is defined as the attainment of the necessary skills and competencies that ensure college graduates' preparedness to enter the workforce successfully.⁹

The National Association of Colleges and Employers (NACE) has defined eight essential competencies that are required by the labor market across all industries. These include career and self-development, communication, critical thinking, equity and inclusion, leadership, professionalism, teamwork, and technological skills.⁹ Employers across nine industries, including the pharmaceutical industry, rated their need for career readiness competencies by using the NACE criteria on a scale from 1 (not essential) to 5 (absolutely essential), critical thinking/problem-solving skills, teamwork/collaboration, and professionalism/work ethic were rated among the topmost essential competencies that employers seek in their candidates.¹⁰ Several studies have found that college graduates lack key competencies demanded by employers, such as communication skills^{11–13} and time management skills.¹³ The graduates of pharmacy programs are lacking in communication skills, the ability to apply their technical knowledge,¹¹ and professionalism.¹⁴

There is a significant gap between the skills that the labor market requires and what college-educated youth actually acquire in the conventional education system across different majors.^{11–14} It is important to note that 72% of young Saudi citizens seek career advice from their friends and families.¹⁵ One approach recommended to address the mismatch between students' career plans and the needs of the labor market is career guidance services.¹⁶ Almaghaslah and associates proposed career guidance services at Saudi pharmacy schools as a possible strategy to improve students' awareness of employment in the private sector.⁷

The role of a career counselor, per UNESCO, comprises developing student awareness of their characteristics, including their values, interests, and abilities; guiding them toward choosing a career path that is well suited to these characteristics; and providing them with helpful resources on available career options.¹⁷ The role of a career counselor may even be extended to assisting students as they develop desirable job skills, increasing their employability, and aiding them as they navigate the job placement process.¹⁸

Our study explored the career readiness of pharmacy students in SA. Particularly, it examined the availability of career guidance services for pharmacy students and alumni in SA. Finally, it investigated the impacts of such services on recipients' choices of career paths and on building their competencies for the market.

Materials and Methods

Study Design

This cross-sectional, questionnaire-based study was conducted from September 2021 to February 2022 to investigate career readiness among pharmacy students and graduates in SA. According to the ministry of health (MOH), as of 2020, the total number of pharmacy schools in SA was 30, majority of which (n = 21, 70%) were government schools.¹ In terms of which pharmacy program is awarded, 24 universities provide PharmD programs while 11 universities provide BPharm programs.¹⁹ The number of enrolled students in Saudi pharmacy schools was 14,004 and 14,395 in 2018 and 2020, respectively.^{8,20} Moreover, we assessed the availability of career guidance to pharmacy students and recent graduates and its impact on their level of career readiness.

Study Population

Our inclusion criteria were undergraduate students in a PharmD or BPharm programs in SA. We included pharmacy students in their fourth, fifth, and internship years, as well any students who had received their degree in the preceding 12 months from graduation (ie, from May 2020 to May 2021), whether from government or from private pharmacy schools, including employed pharmacists who had graduated within the specified period.

Ethical Requirements

The Scientific Research Ethics Committee at Taif University approved this study (Approval No. 43-055). Informed consent was required before any responses were submitted. We stored responses to the questionnaire securely and limited access to the primary investigators.

Data Collection

We collected data using an online questionnaire that the researchers created using Google Forms. We distributed the link to participants using confirmed email addresses and social media platforms. We also contacted the deans of pharmacy colleges in SA via email to request that they invite attending students who met our inclusion criteria to participate in the study.

Questionnaire Development

The questionnaire comprised five sections. The first section [seven items] collected the demographic characteristics, including gender, age, university name, type of university, type of pharmacy program, GPA, and academic year. The second section regarded the participants' perceptions of their career readiness [five items], using responses to items on a five-point Likert scale that ranged from "strongly disagree" to "strongly agree" for aspects of participant awareness of all possible career choices after graduation, level of confidence in which career path to take after graduation, awareness of what it takes to succeed in their chosen career path, awareness of their career goals, and awareness of the importance of choosing a career that is in line with their values and interests. The third section was centered on the availability of career guidance [five items]; we asked participants whether they had attended career guidance sessions, webinars, or courses and whether career guidance services were available at their university or college. We also queried whether they had themselves reached out to a career counselor for advice at the university or college level. The fourth section concerned the impact that career guidance had on them [five items], using the same five-point Likert scale used above, ranging from "strongly agree" to "strongly disagree", with items on the participant's view of the careers and job opportunities available to them in pharmacy employment, their interests, values, career goals/path, awareness of the opportunities available in the market that match their interests/values/goals, establishment of the participant's portfolio/CV, and building the skills and competencies needed for the participants to succeed in their chosen career paths. The fifth section contained an adapted version of the Work Readiness Scale (WRS)^{21,22} and it measured the participants' perceived level of work readiness and measured work competence [six items], social intelligence [five items], personal characteristics [five items], and organizational acumen [four items] on a five-point Likert scale, ranging from "strongly agree" to "strongly disagree".

Questionnaire Validation

The first four sections of the questionnaire were developed specifically for this study. The fifth was adapted from a previously validated questionnaire with only minor modifications.^{21,22} Given that the primary language for the study and practice of healthcare in SA is English, we administered the questionnaire in English and added an Arabic translation for optimal comprehension. A panel of five researchers at the College of Pharmacy at Taif University reviewed the questionnaire for face and content validity, consistency, clarity, phrasing, relevance, and appropriateness for the local context. The revised questionnaire had a total of 42 items. After the questionnaire was reviewed, we conducted a pilot study to confirm its suitability and relevance and that it can be administered without difficulties.

Statistical Analysis

The data were analyzed descriptively using frequencies and percentages for categorical variables. This included responses for awareness about career readiness requirements, availability of career guidance services, and the impact of career guidance services on participants' career readiness. Responses for WRS were treated as continuous variables, and the average scores were computed for the participants' responses. An overall rating score was calculated for each group of items that constituted one domain. For this study, an average score of ≥ 4 was considered excellent, 3 to < 4 was considered good, 2 to < 3 was considered acceptable (ie, average), 1 to < 2 was considered poor, and < 1 was considered

very poor. The overall average scores of WRS four domains were compared among counterparts by participants' gender, type of university (government versus private), Taif University versus other universities, and type of program (BPharm versus PharmD) using *t*-test. Comparisons by participants' age and year of study were made using One-way ANOVA. A *p* value of <0.05 was considered to be statistically significant.

Results

Participant Characteristics

Between September 2021 and February 2022, 576 pharmacy students and recent graduates from a range of universities in SA participated in this study. Slightly more than half (*n* = 321) of the participants were female, 97% (*n* = 559) had attended or graduated from public university, 88.4% (*n* = 509) were completing or had completed a PharmD degree, 24.3% (*n* = 140) were in their sixth year, and 23.8% (*n* = 137) had graduated within the past 12 months. [Table 1](#) presents the demographic characteristics of the participants.

Participants' Awareness Regarding Career Readiness Requirements

[Table 2](#) shows levels of awareness among the participants concerning the needs of the job market and their readiness. The highest level of agreement was found for the statement "I think it is important to choose a career that is in line with my values and interests" (*n* = 337, 58.8%), and the lowest was found for the statement "I am confident of which career path to take after graduation" (*n* = 55, 9.6%).

Availability of Career Guidance Services and Its Impact on Participants' Career Readiness

Approximately 64% (*n* = 368) of the participants had never attended career guidance sessions or webinars, whereas 57.6% (*n* = 332) or 52.3% (*n* = 301), respectively, confirmed that they lack knowledge of the availability of career guidance services at their university and pharmacy college. Approximately 10.4% (*n* = 60) and 14.8% (*n* = 85) reported reaching out to a career counselor service at their university and pharmacy college, respectively ([Table 3](#)). About half of the participants (*n* = 290, 50.7%) show disagreement for the impact of career guidance services on establishing their portfolio/CV ([Table 4](#)).

Adapted Work Readiness Scale

For social intelligence, the highest scores were reported in communication skills, and participants indicated that they communicated effectively with patients and colleagues (Mean \pm SD, 3.89 \pm 1.12). Participants agreed on the importance of learning about an organization before working with it. This was reported in relation to organizational acumen (Mean \pm SD, 4.35 \pm 1.04). Among personal characteristics, participants scored the lowest when they were asked whether they always feel prepared for unexpected situations (Mean \pm SD, 3.45 \pm 1.15). Regarding the work competence domain, participants scored the lowest when they were asked whether they considered themselves competent to apply their knowledge to the field (Mean \pm SD, 3.49 \pm 1.10), as shown in [Table 5](#). When the overall average scores of the four domains of WRS were compared among the counterparts by participant categories, few statistically significant differences were found. Under organizational acumen domain, participants from governmental universities scored higher than those from private ones (Mean \pm SD: 4.09 \pm 0.88 versus 3.66 \pm 0.95, *p* value = 0.049). The average scores for personal characteristics (Mean \pm SD: 3.56 \pm 0.88, 3.70 \pm 0.93, and 3.88 \pm 0.85 for the 4th, 5th, and 6th years respectively, *p* value = 0.035) and work competence (Mean \pm SD: 3.56 \pm 0.83, 3.66 \pm 0.86, and 3.89 \pm 0.86 for the 4th, 5th and 6th years respectively, *p* value = 0.007) increased as the year of study increased.

Discussion

This study investigated career readiness among pharmacy students and fresh graduates, availability of career guidance services, and perceived impact of their availability on students' chosen career paths. Further, the study revealed that

Table 1 Participant Characteristics

Characteristics	Number (%)
Gender	
Female	321 (55.7)
Male	255 (44.3)
Age	
21	54 (9.4)
22	131 (22.7)
23	163 (28.3)
24	99 (17.2)
25	64 (11.1)
26	33 (5.7)
27 or older	32 (5.6)
Name of university	
King Saud University for Health Sciences (KSAU-HS)	37 (6.4)
King Faisal University	8 (1.4)
King Saud University	66 (11.5)
King Abdulaziz University	28 (4.9)
Umm Al-Qura University	41 (7.1)
Princess Nourah University	21 (3.6)
Taif University	165 (28.6)
Taibah University	12 (2.1)
Hail University	17 (3.0)
Jazan University	17 (3.0)
Tabuk University	5 (0.9)
Jouf University	12 (2.1)
Imam Abdulrahman University	15 (2.6)
Northern Borders University	6 (1.0)
Prince Sattam Bin Abdulaziz University	24 (4.2)
Almaarefah University	3 (0.5)
Ibn Sina University	6 (1.0)
Mohammed Manea University	2 (0.3)
Albaha University	24 (4.2)
Shaqra University	6 (1.0)
Qassim University	36 (6.3)
Riyadh Elm University	6 (1.0)
Abha University	18 (3.1)
Najran University	1 (0.2)
Type of university	
Government	559 (97.0)
Private	17 (3.0)
Pharmacy program	
Bachelor of Pharmaceutical Sciences (BPharm)	67 (11.7)
Doctor of Pharmacy (PharmD)	509 (88.4)
Academic year	
4th Year	131 (22.7)
5th Year	168 (29.2)
6th Year	140 (24.3)
Graduated within the past 12 months	137 (23.8)

(Continued)

Table 1 (Continued).

Characteristics	Number (%)
GPA	
Out of 4.00	
Less than 2.00	7 (1.2)
2.00–2.49	15 (2.6)
2.50–2.99	45 (7.8)
3.00–3.49	91 (15.8)
3.50 and above	89 (15.5)
Out of 5.00	
Less than 3.00	17 (3.0)
3.00–3.49	36 (6.2)
3.50–3.99	47 (8.2)
4.00–4.49	102 (17.7)
4.50 and above	127 (22.0)

Table 2 Participants' Awareness Regarding Career Readiness Requirements

Item	Frequency (%)				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am aware of all the possible career choices for me after graduation/as a pharmacy graduate	41 (7.2)	76 (13.3)	156 (27.2)	163 (28.4)	137 (23.9)
I am confident of which career path to take after graduation	103 (18.0)	124 (21.6)	176 (30.7)	115 (20.1)	55 (9.6)
I know what it takes to succeed in my chosen career path	88 (15.4)	123 (21.5)	169 (29.5)	117 (20.4)	76 (13.3)
I know what my career goals are	74 (12.9)	93 (16.2)	153 (26.7)	144 (25.1)	109 (19.0)
I think it is important to choose a career that is in line with my values and interests	33 (5.8)	20 (3.5)	63 (11.0)	120 (20.9)	337 (58.8)

pharmacy students and graduates believed that they are aware of their career paths, and based on their scores on the career readiness scale, they demonstrated good-to-excellent career readiness. We believe that our results can be used effectively as baseline data to help identify gaps in Saudi pharmacy programs that should receive immediate attention from pharmacy educators as they seek to build the competency of their students and graduates.

Interestingly, approximately two-thirds of participants had never attended career guidance sessions or webinars. Thus, readiness among students might be related to support from their families and friends, something that is well established in Saudi culture and community, where families and relatives take responsibility for raising youth awareness to some extent. The literature shows that 72% of young Saudi citizens seek career advice from their friends and families.¹⁵

The highest disagreements were given in relation to the participants' awareness of what career path to take after graduation and whether they had the real-world skills needed to succeed on their chosen paths. The integration of career and professional development courses into pharmacy programs and facilitating student–alumni networking, which have been effective,^{23,24} are not common practices in Saudi pharmacy schools. One strategy that was implemented to build students' and graduates' competence in the market is the establishment of career guidance units. Nevertheless, despite the availability of these units at most Saudi universities, approximately two-thirds of pharmacy students and fresh graduates stated that they had never attended career guidance sessions, webinars, or courses while they were students. Moreover, approximately 57.6% and 17% of them were not aware of or confirmed the unavailability of such services, respectively. Similar results were identified with respect to the availability of career

Table 3 Availability of Career Guidance Services

Item	Frequency (%)
Have you previously attended career guidance sessions, webinars, courses?	
Yes	208 (36.1)
No	368 (63.9)
Are career guidance services available at your university?	
Yes	146 (25.3)
No	98 (17.0)
I do not know	332 (57.6)
Are career guidance services available at your college?	
Yes	144 (25.0)
No	131 (22.7)
I do not know	301 (52.3)
Have you reached out to a career counsellor at your university for advice about your pharmacy career?	
Yes	60 (10.4)
No	516 (89.6)
Have you reached out to a career counsellor at your college for advice about your pharmacy career?	
Yes	85 (14.8)
No	419 (85.2)

Table 4 Impact of Career Guidance Services on Participants' Career Readiness

Item	Frequency (%)				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Career guidance services improved my view of the available career and job opportunities in pharmacy	156 (27.2)	97 (16.9)	204 (35.6)	67 (11.7)	49 (8.6)
Career guidance services helped me identify my interests, values, career goals and career path	165 (28.8)	103 (18.0)	195 (34.0)	72 (12.6)	38 (6.6)
Career guidance made me aware of the opportunities available in the market that match my interests, values, goals and career path	173 (30.2)	93 (16.2)	188 (32.8)	75 (13.1)	44 (7.7)
Career guidance helped me establish my portfolio/ CV	190 (33.2)	100 (17.5)	173 (30.2)	64 (11.2)	46 (8.0)
Career guidance services helped me build the required skills and competencies to succeed in my chosen career path	179 (31.2)	101 (17.6)	186 (32.5)	65 (11.3)	42 (7.3)

guidance services at the college level, where 75% of participants had confirmed either the lack of knowledge of services available or the unavailability of such services. In the same context, 89.6% and 85.2% said that they had never reached out to a career counselor at the university and college level, respectively. Additionally, the highest level of disagreement was found with respect to the effects of career guidance on their knowledge of available opportunities in the job market that match their personal goals and interests (46.4%), their CV/portfolio (50.7%), and attaining the skills that would be required (48.8%). Moosa et al reported similar findings among students attending Dar Al Hekma College in SA, where 46.7% of respondents were not aware of the availability of the career guidance services at their institution. Among those who were aware, 76% indicated that they had never used the services. Lack of awareness regarding the availability of the services was ranked first among reasons for not utilizing the services, followed by lack of time.²⁵ However, two of the limitations of the study conducted by Moosa et al were its small sample size and the limited ability to compare the results

Table 5 Work Readiness Scale (WRS)

Item	Mean (SD)	Mean Domain Score (SD)
Social Intelligence		3.64 (0.94)
- Developing relationships with people is one of my strengths	3.51 (1.26)	
- I communicate effectively with different patients and colleagues	3.89 (1.12)	
- I am good at reading other people's body language	3.63 (1.13)	
- Approaching senior people at work is one of my strengths	3.58 (1.21)	
- I feel confident to address interpersonal conflicts in the workplace	3.60 (1.12)	
Organizational Acumen		4.07 (0.88)
- I look forward to the opportunity to learn and grow	4.27 (1.05)	
- I see all feedback as an opportunity for learning	4.22 (1.05)	
- I do not take others' aggressive behavior personally	3.47 (1.19)	
- It is important to learn as much as I can about the organization before working within it	4.35 (1.04)	
Personal Characteristics		3.71 (0.89)
- I remain calm under pressure	3.65 (1.10)	
- When a pressing situation that needs my attention arises, I can easily reprioritize my focus	3.77 (1.10)	
- Adapting to different social situations is one of my strengths	3.76 (1.11)	
- I am always prepared for the unexpected to occur	3.45 (1.15)	
- I am always motivated to be involved in a new project	3.94 (1.15)	
Work Competence		3.73 (0.87)
- I have a solid theoretical understanding of my field	3.54 (1.05)	
- I consider myself competent to apply my knowledge to the field	3.49 (1.10)	
- I know my strengths and weaknesses	3.74 (1.11)	
- Analyzing and solving complex problems is one of my strengths	3.59 (1.11)	
- At work, it is important to always take responsibility for my decisions and actions	4.28 (1.06)	
- I have the ability to think of new and innovative ideas and make initiatives	3.74 (1.13)	

with ours, as its study different population than ours. By contrast, a study from the United States performed by Ives et al reported favorable findings among students and graduates from the University of Michigan, where 76.8% reported satisfaction with their access to career development services.²³ Our finding emphasizes the importance of developing a proper advertising strategy at the institutional level to mitigate the gap between the availability of services and true utilization by the targeted beneficiaries. One strategy proposed in the literature that might help in improving awareness about the availability of career guidance services is automating career counseling to enable students to receive access to requested career guidance with the ability to ask anonymous questions upon admission to a college. It is also important to expand services to include additional informal and attractive activities. Examples include implementing a job board, etiquette dinner, or professional skills day and introducing the concept of career and professional development into the curriculum during the early years of the pharmacy programs and providing networking opportunities with alumni. Regular feedback from students and graduates should be sought to assess the success of these measures and identify barriers to implementation.²³

We assessed work readiness with the WRS, which includes four domains, namely, social intelligence, organizational acumen, personal characteristics, and work competence. Among those, organizational acumen received the highest overall score and social intelligence received the lowest (in descending order, the groups were organizational acumen, work competence, personal characteristics, and social intelligence). However, participant performance can be considered adequate, even in the least scored domain. By contrast, in a study conducted by Abuhussain et al, the participants ranked work competence and social intelligence the highest, followed by organizational acumen and personal characteristics.²⁶ An advantage of our study was that we incorporated the WRS into our survey, together with the other items that assessed the availability of career guidance services and the perceived impact of such services on recipients' career path choices and on building their competencies for the market. Another difference was that Abuhussain et al included a higher

proportion of graduates who might already have had some work experience, whereas most participants in our study were students (ie, only 23.7% of the participants were new graduates). Hence, our study results likely reflect work readiness among pharmacy students. Moreover, we included students starting from the fourth year, which we believe provides deeper insight for investigating career awareness in pharmacy students.

Strengths and Limitations of the Present Study

The study's strengths include a significant representation of the study population because we included pharmacy students from the fourth year to the internship year, along with fresh graduates as well to achieve further insight into the participants' perception of their readiness for the job market per academic year. This will facilitate the creation of a more tailored career guidance service that accounts for its beneficiaries' academic status in determining the optimal implementation and timing, as well as the appropriate type of career awareness initiative. The study included participants from all cities of SA. Moreover, all participants completed all items of the questionnaire.

Nevertheless, this study had a few limitations. The participants may have overestimated their work readiness, which could be attributed to social desirability bias, such that there is a tendency to overreport positive behaviors relative to negative ones. We noticed a low rate of participation among students and graduates of private schools and among individuals from the southern and northern parts of SA. Additionally, the study investigated career awareness and readiness from the students' perspectives only, without considering employers' or preceptors' perspectives, which are highly important for ensuring an objective estimate of career readiness. Nevertheless, the study was able to identify a gap in pharmacy education, offering the opportunity to design a more targeted, systemic intervention to provide elements currently missing in curricula.

Conclusion

Despite the availability of career guidance units at most Saudi pharmacy schools, Saudi pharmacy students and graduates lack knowledge of the availability of such services; hence, their access to them is limited, leaving them disadvantaged because they miss opportunities to gain the complete skillsets required in the rapidly changing Saudi job market. Increased awareness of this issue will create the opportunity for leaders in pharmacy education to take proper measures to advertise the availability of these services at their institutions. Future studies should continue to investigate career readiness among pharmacy students and graduates using the NACE competencies. Work incorporating preceptors' and employers' perspectives helps identify gaps in curricula to minimize the mismatch between students' career plans and their skillsets at pharmacy schools.

Data Sharing Statement

The raw data supporting the conclusions of this article will be made available by authors, without undue reservation.

Consent for Publication

Participants were informed via the participant information sheet that they agreed to participate in the study and offered their consent to the use of their anonymized data in publications.

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Author Contributions

All authors made a significant contribution to the work reported, including conception, study design, execution, data acquisition, analysis, and interpretation; they took part in drafting, revising, or critically reviewing the article and provided their final approval of the version to be published. Further, all authors agreed on the journal to which the article has been submitted and accepted responsibility for all aspects of the work.

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