

The Impact of Interdisciplinary Collaboration on Patient Care in Pharmacy, Administration, Psychology, Radiology, and Nursing

Fahd Ali Muhammad Al Abdullah^{1*}, Abdulhadi Ahmed Ali Alzaqli², Nasser Rashed Ali Al Alzaqli³, Musaad Omran Musaad Al Dossray⁴, Khmais Omran Khamis AlSaad⁵, Rahmah Mubarak Mabrook Alghobari⁶, Ahmad Hussin Al Masham⁷, Ali Mohammed Mohammed Al Htealh⁸, Ahmed mane Ali Al Ageel⁹, Sherif Rashid Saleh Al Saeeda¹⁰

¹Nurse Technician, Administration of Sharia Health Bodies in the Najran Region, Saudi Arabia

²Assistant Specialist of Psychology, General Najran Hospital, Najran, Saudi Arabia

³Assistant Pharmacist, Medical Supply Management, Najran, Saudi Arabia

⁴Radiological Technology, Wadi Aldwaser Hospital, Wadi Aldwaser, Saudi Arabia

⁵Sociology Specialist, Maternity and Children Hospital, Najran, Saudi Arabia

⁶Nurse Technician, Maternity and Children Hospital, Najran, Saudi Arabia

⁷Physical Therapy Technician, Medical Rehabilitation Administration, Najran, Saudi Arabia

⁸Health Administration Specialist, Medical Authority, Najran, Saudi Arabia

⁹Clinical Nutritionist, Najran General Hospital, Najran, Saudi Arabia

¹⁰Epidemiological Surveillance Technician, Najran General Hospital, Najran, Saudi Arabia

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*Corresponding author: Fahd Ali Muhammad Al Abdullah

Nurse Technician, Administration of Sharia Health Bodies in the Najran Region, Saudi Arabia

Abstract

The impact of interdisciplinary collaboration on patient care in various fields such as pharmacy, administration, psychology, radiology, and nursing cannot be overstated. The integration of knowledge and expertise from these diverse disciplines has significantly improved the quality of care provided to patients, leading to better health outcomes and overall patient satisfaction. One of the key benefits of interdisciplinary collaboration is the ability to bring together different perspectives and approaches to problem-solving. In a healthcare setting, this can be particularly valuable as it allows for a more comprehensive understanding of a patient's needs and challenges. The value of interdisciplinary collaboration lies in its ability to leverage the unique expertise and perspectives of professionals from different fields, thereby fostering a more holistic and comprehensive approach to problem-solving. Interdisciplinary collaboration has the potential to generate fresh perspectives and comprehension across boundaries between disciplines. Multidisciplinary study that is new can cross borders of disciplines to address complex and referred to as vicious issues facing culture.

Keywords: Interdisciplinary, Collaboration, Pharmacy, Radiology, Nursing, Psychology, patient care, Patient health.

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INTRODUCTION

Patients, relatives, and highly professional medical specialists are all involved in the provision of healthcare. Every member of the team must work together and collaborate to provide great care [1]. Nurses, physicians, pharmacists, and patients are the major collaborators in the administration of drugs in healthcare facilities. These personnel have critical roles in pharmaceutical prescription, dispensing, administration, drug intake, drug tracking, assessment, and patient consulting [2]. When opposed to traditional functional teams, interdisciplinary teams can be more productive, beneficial, creative, and risk-averse. This is accomplished by allowing a wide range of ideas,

concerns, and concessions to be sorted out as early as feasible in order to minimize expenses mistakes, reworking, and misunderstanding [1]. According to WHO (2010), the globe is suffering a lack of health professionals, and governments are seeking for novel strategies to help them establish policies and programs, interdisciplinary team collaboration in the medical field is critical for the growth of a health profession that values teamwork [3]. Interprofessional treatment refers to the practices that help to provide the finest medical services that benefit patients while also achieving the best expected results and patients satisfaction [4]. When examining cooperation approaches in medical care, an interdisciplinary approach is required. Interdisciplinary methods, as opposed to multidisciplinary methods, have

the benefit of bringing together a collaborative effort from several disciplines which share the same purpose to treat an individual's medical care condition. This collaboration of specialists is what allows for long-term successful integrative treatments. Furthermore, enhanced interdisciplinary collaboration and communication have been shown to be essential aspects that medical field professionals regard as critical in enhancing clinical efficiency and job fulfillment [5]. In a study published in 2018 to assess the impact of interdisciplinary collaboration on errors occurring in medical field since communication difficulties are frequently responsible for medication mishaps; it found that five key fields of interdisciplinary collaboration have been determined. These categories were: contact through tools such as instructions, rules, and interaction logs; pharmacy participation in interdisciplinary teams; collaborative review of medications on admitting and release; cooperative courses and seminars; and as well as the complexities of job variation and environment. Despite optimistic findings in previous study, medical mistakes appeared to happen. A greater emphasis is required on generating specialized, personalized approaches. Greater awareness of the shifting positions of various disciplines is also required [6]. Brem, Puente-Diaz, and Agogué (2016) provide an assessment of the modern facilities for creative in managing innovation and advocate for an increased interdisciplinary perspective [7]. As the multifaceted nature of medical services necessitates a combination of expertise and procedures from several various fields, cooperation and interdisciplinary collaboration have been identified as an approach for successful healthcare delivery organization. This combination has a descriptive character that can be discovered through health workers' perspectives and the significance they place on collaboration. Systemic review was performed to include the best current research on healthcare personnel' expertise with cooperation & interdisciplinary collaboration in the field of primary care resulting in increasing teaming and interdisciplinary collaboration in primary care center, medical professionals encounter huge ideological, corporate, fundamental, and social barriers [8]. To assess the effects of implementing an interdisciplinary measuring form that formalized nurses' involvement in rounds on the efficacy of interprofessional collaboration, particularly between healthcare professionals like nurses and doctors; also to assess the potential effect of implementing these rounds on identifiable patient care impacts, Interdisciplinary round offer an appealing approach for enhancing interprofessional collaboration in emergency rooms. Outcomes add to the increasing amount of proof that interdisciplinary rounds promote teamwork and have a beneficial influence on patient care quality during delivery [9].

The Impact in Pharmacy:

Interprofessional teamwork is regarded as necessary for providing safe, successful, and productive

healthcare. This collaboration is in reaction to drug mistakes that have major side effects and may pose a deadly risk of disease [10]. A pharmacist is an essential part of the medical professionals who administer preventive and curative pharmaceutical care and act as an asset to patients and medical professionals. A pharmacist works with other experts and the patient to develop, execute, and evaluate a treatment strategy to help avoid delay, and treat complications and symptoms. Many research studies show that pharmacists have a favorable impact on patient care. A recent Cochrane Review found that pharmacist treatments enhanced clinical results despite being highly educated and with doctorates becoming a mandatory competence for action; pharmacists continue to be an underused source. In context with the medical professional lack, pharmacists have enormous opportunity for closing the "medical care entry" gap. They frequently represent the only medical professionals open to suburban and underprivileged communities, are distinctively obtainable without the effort of arranging a visit, and are frequently considered as one of the most reliable specialists [11]. Chronic diseases necessitate regular drug evaluations as well as medical examinations, putting general practitioners' (GPs) resources as well as time under strain. Many actions related to chronic disease care could be performed within the community by additional medical professionals, such as community pharmacists (CPs). CPs' roles have changed from assisting physicians by monitoring and dispensing medicines to a deeper role in which CPs are becoming increasingly self-sufficient [12]. Close engagement with GPs is required in order to keep track of the drugs taken by patients and general medical results. Despite the growing need for cooperation, there is a shortage of the elements that lead to successful collaboration between CPs and GPs, factors such as a lack of connection and cooperation between both professions could be significant hurdles to collaboration. So in a systemic review focusing on non-co-located cooperation among GPs and CPs was primarily beneficially affected by circumstances with enough assets and close separation between careers, straightforward and frequent contact, a history of collaboration, as well as comprehending each other's strengths and duties when providing care to patients. The presumed inequality in position and authority between professions, as well as a lack of awareness of each other individual's skills and expertise, were factors that created a challenge to efficient interprofessional collaboration. The findings of this review can help researchers and managers improve and execute methods to improve cooperation among GPs and CPs [13]. To synthesize, summarize, and assess the efficacy of qualitative and quantitative research on pharmacy undergraduates', pharmacy faculties, and practicing pharmacists' opinions on interdisciplinary and collaborative practice. Their points of view comprised their thoughts, incidents, and mindsets, with a particular emphasis on the believed advantages and obstacles of interdisciplinary and collaborative practice. The results

will allow politicians and other interested parties to plan and conduct significant, broad, and innovative IPE activities. To enhance and foster an interdisciplinary culture at both the personal and organizational levels, ongoing efforts are needed not only in undergraduate curricula but also in medical facilities [14]. Pharmacists in interdisciplinary collaboration have a favourable impact on patients' medical results during the hospital & home care [15].

The Impact in Psychology:

Identified IPE as a technique to enhance job happiness, promote understanding for medical organizations, while offering a more comprehensive approach to patient management. The Institute for Healthcare Improvement has recently recommended educational medical schools to put in IPE training to educate medical practitioner trainees to collaborate successfully. IPE is a revolutionary educational strategy that generates a sequence of instruction in which students from various health professions learn about, from, and with one another with the purpose of developing cooperation skills [16]. Psychology arrived later than other professions to the IPE movement, joining an expanded Interprofessional Education Collaborative (IPEC) in 2016 [17]. According to Zorek and Raehl (2013), 18 of 21 accreditation criteria papers spanning multiple medical fields included IPE-related comments holding schools responsible for fulfilling an IPEC competence result [18]. The most "accountable" assertions have been included in nursing and pharmacy instructive accreditation criteria; no obvious IPEC competence claims were included in psychology accreditation criteria under the pre-IPEC American Psychological Association's (APA, 1996) Guidelines and Principles of Accreditation [18]. Only 1.4% of the 2348 articles identified through December 2018 ($n = 37$) included psychological research either among students or trainers, displaying the comparatively little research on psychology and IPE as well as the allegedly little effect of psychology instruction on IPE to date. Only a couple of these papers have appeared in journals primarily dedicated to psychology. Various searches for "interprofessional teaching" in conjunction with every field that took part in IPEC [17], yielded a range of papers. The two parts that follow condense the research on IPE and psychology into two basic categories: IPE assessment studies and publications presenting IPE with psychology learners or instructors. Psychology has fallen behind other fields in integrating and advocating the IPE concept and incorporating it into upcoming psychologist education. Psychology practitioners were fewer engaged in IPE than trainees from other fields of health care. The positive aspect is that chances for psychologists to participate in IPE are expanding. We hope that psychologists will enthusiastically respond to this calling to take action for psychology students, instructors, and trainee to get more deeply involved with IPE. They will be more equipped to identify and capitalize on chances to become more fully incorporated into developing

interdisciplinary collaboration [16]. Confusion regarding the medical care system's development and the changing responsibilities of varied behavioral doctors make it impossible to foresee the specific functions that psychologists will eventually play in joint and coordinated care settings. There are obstacles to interaction that must be identified and maintained. Psychologists are advised to improve interactions with other actions and non-behavioral health workers and to vigorously promote the development of cooperative environments and the organizational facilities that promote these circumstances be prepared for shifting and possibly unexpected roles and strategies. The acknowledgment of cooperation's significance and a desire to acknowledge cooperation as a vital element of their careers and clinical work may have a significant impact on psychology's progress as an occupational health field [19]. Whenever practitioners join psychology schools with the intention of becoming psychologists, they often fail to recognize the importance of developing larger professional constructs as medical professionals and interprofessional coworkers. Occupational growth as a psychologist can start with conceptions of oneself as a solo practitioner in a solitary practice. A person's identity must grow gradually in order to accept the position a medical professional offering therapy in an interprofessional framework. The transition from psychologist to medical expert might be surprising and confounding. Interwoven IPE encounters can be transforming for participants, consolidating their particular to a discipline character while forming their identities as healthcare practitioners and interprofessional team members [20].

The Impact in Hospital Administration:

It is important to have suitable administrative setups, such as defined standard procedures and appropriate data frameworks, along with space, time, and funds that allow workers to become familiar with one another while addressing difficulties that emerge. Furthermore, several authors advocate the value of an inclusive and responsive work culture, as well as a readiness to collaborate and communicate openly. Such models are positioned as an obstacle for healthcare professionals to encourage and make possible the required circumstances [21]. The topic of healthcare administration is clearly missing from the conversation. This position represents the hierarchical structure of medical care corporations as specialized government agencies, with clinical experts exercising substantial discretion and administrators considered as nearly- or semi-professionals. This is not just a squandered chance for administrators, but it also severely limits the possibility for change and progress that interprofessional practice promises. An opportunity exists for healthcare administrators to more forcefully contribute to and accelerate the interprofessional care movement. The pressures for cost control and value creation in healthcare delivery, for maximizing productivity, and for improving quality through integration and coordination

are strong and increasing. The interprofessional care movement is in part a response to these forces [22].

The Impact in Nursing:

A number of obstacles to interprofessional collaboration among nurses and doctors have been found by research, including dispersion of academic pursuits and clinical experience, which adds to a deep attachment with one's own specialty with minimal dedication to teamwork [23]. The nurse work environment is an important organizational aspect that either promotes or hinders efficient advancement in nursing. Nurses are actively engaged in healthcare operations at institutions with favourable work conditions, the nursing staff and hospital facilities are agreeable, nurse supervisors give enough leadership qualities, and collaborative interactions among doctors and nurses are obvious. These organizational qualities were discovered to improve productivity, increase safety for patients, and improve general treatment quality, creating a successful healthcare system. Significant data indicates that a work climate regarded as moderate to great promotes job autonomy, inspiration, dedication, and achievement, leading to an extremely pleased nursing crew. A positive nursing workplace has also been linked to improved psychological health, wellness, and retention in the job [24]. Nurses contribute to medical field by identifying clinical shifts, communicating & discussing pharmaceutical treatment with patients, supporters, and other medical care professionals, suggesting and carrying out medication-related actions, and maintaining patient and drug treatment monitoring. A structure for the assessment of nurses' competencies in understanding, abilities, and mindsets in interprofessional medical duties is currently lacking. So, to obtain a settlement with professionals on the competencies of nurses for responsibilities in interdisciplinary pharmacological care, a dual-phase study was carried out, beginning with a scoping review and ending with five Delphi rounds. This research produced a structure of competencies for skill-based nursing schooling. Future studies should concentrate on incorporating these competencies into nursing education. A standardized instrument for assessing students' readiness to gain competency in interprofessional pharmacological care in clinical settings should be devised [25]. cross-sectional study meant to explain the connection among nurse management skills and interdisciplinary collaboration consisted of Members included 3,324 nurses with more than three years of employment in an ICU in Japan. Eventually concluded Enhancing emergency room nurses' managerial skills may have a beneficial effect on interdisciplinary collaboration. Nursing management ability has been linked to a significant amount collaboration between various medical care professionals. Nurses must boost their degree of expertise and ability to improve their capacity for management as emergency room nurses. Nevertheless, investigating and carrying out educational strategies,

such as improving collaboration skill primarily through APNs, remains a difficulty [26].

The Impact in Radiology:

Interprofessional interaction in medicine has altered considerably as a result of the rapid growth of electronic means of communication over the last few decades. This applies to many fields, but it is especially noticeable in the contact between referral doctors and radiologists. Thus, with the arrival of PACS picture and saving systems and digital referring and documentation systems, radiological reports and pictures are now accessible to clinicians at any time and from any location, i.e., not just in the radiology section or at radiology phases or conferences. Conventional and current interprofessional communication may be jeopardized as a result, for example, resulting in fewer chances for physicians and radiologists to speak in person with one another [27]. To examine the options, effectiveness, and perceptions of interprofessional communication between referral doctors and radiologists, as well as recognize challenges and opportunities in this scenario encountered by referring doctors working in a university hospital setting with electronic photographic equipment and digital referring and reporting systems. So in conclusion Broadened direct relationships between physicians and radiologists were regarded as requirements for collaboration, mutual competency, and trust; a critical aspect in interprofessional communication. Doctors and radiologists should collaborate in order to receive bidirectional feedback and a better understanding of the specific requirements of subspecialized doctors [28]. A mutually acceptable strategy with measurable outcomes can be carried out in a progressive approach. The professional positions in the radiology department should be addressed in order to create a thorough plan. Partners can cooperate more successfully toward strengthening human capacity, facilities logistical system, and various other requirements if they understand the expert competence and importance of all members [29]. The Interprofessional Education Collaborative is a nationwide organization dedicated to encouraging collaborative medical treatment and developing interprofessional educational opportunities. However, no studies have been conducted on the heads of radiologic scientific schools. Given their influence on radiologic technology services, it is vital to examine project coordinators' views and beliefs. So, a study looked at how program supervisors prioritized the four IPE core skills, how IPE is now applied in their course, and the variations between program heads who utilized IPE compared to those who had not, program directors strongly favor the implementation of IPE in radiology studies programs. The radiology program heads reported strong relationships with other medical-care-related courses, which was consistent with prior study results. Many heads of programs who had not yet incorporated IPE indicated that they were looking into methods to add an IPE exercise into the curriculum.

However, obstacles to IPE deployment have been found [30]. Radiologists and the physicians that they serve speak the same medical vocabulary. In addition, there is an accepted technique for communicating in the radiological report. But what should be done when the data has to be transmitted to a person who is not familiar with professional diagnosis examination! The radiologists have to learn how to express technical terms and ideas to people with no medical knowledge, Interdisciplinary cooperation among radiologist and data researchers is required for an effective strategy towards machine training in diagnosis picture analysis. The involvement of many topic experts is not only crucial to achieving the final objective, but also enables us to be highly innovative and create more extraordinary results. Although there may be some unexpected challenges, we are able to conquer them through confidence, ability to listen, and an eagerness to learn from each other. Our personal expertise is limited. Our shared imagination is infinite when we cooperate together [31].

CONCLUSION

Shared interdisciplinary professional experiences can help potential partnerships build enhanced methods to collaborate together. Interdisciplinary collaboration presents several problems that should not be disregarded when creating and budgeting projects. Because of these obstacles, proper management and planning of projects are more important from the start. When creating and conducting interdisciplinary projects, using the fundamentals criteria may help prevent a few of the possible problems of interdisciplinary collaboration.

REFERENCES

- Morley, L., & Cashel, A. (2017). Collaboration in health care. *Journal of medical imaging and radiation sciences*, 48(2), 207-216.
- Liu, W., Gerdtz, M., & Manias, E. (2016). Creating opportunities for interdisciplinary collaboration and patient-centered care: how nurses, doctors, pharmacists, and patients use communication strategies when managing medications in an Acute Hospital Setting. *Journal of Clinical Nursing*, 25(19-20), 2943-2957.
- Kaini, B. K. (2017). Interprofessional team collaboration in health care. *Global Journal of Medical Research*, 17(2).
- Care, I. (2010). Implementing Interprofessional Care in Ontario.
- Busari, J. O., Moll, F. M., & Duits, A. J. (2017). Understanding the impact of interprofessional collaboration on the quality of care: a case report from a small-scale resource limited health care environment. *Journal of multidisciplinary healthcare*, 227-234.
- Manias, E. (2018). Effects of interdisciplinary collaboration in hospitals on medication errors: an integrative review. *Expert Opinion on Drug Safety*, 17(3), 259-275.
- Brem, A., Puente-Diaz, R., & Agogué, M. (2016). Creativity and innovation: State of the art and future perspectives for research. *International Journal of Innovation Management*, 20(04), 1602001.
- Sangaleti, C., Schweitzer, M. C., Peduzzi, M., Zoboli, E. L. C. P., & Soares, C. B. (2017). Experiences and shared meaning of teamwork and interprofessional collaboration among health care professionals in primary health care settings: a systematic review. *JBIC Evidence Synthesis*, 15(11), 2723-2788.
- Urisman, T., Garcia, A., & Harris, H. W. (2018). Impact of surgical intensive care unit interdisciplinary rounds on interprofessional collaboration and quality of care: Mixed qualitative–quantitative study. *Intensive and Critical Care Nursing*, 44, 18-23.
- Wikanendra, G. B. (2020). Effects of interprofessional collaboration program in community on the perception of pharmacy and medical students. *Jurnal Farmasi Sains dan Komunitas*, 17(2), 112-119.
- Kaur, L., & Tadros, E. (2018). The benefits of interprofessional collaboration for a pharmacist and family therapist. *The American Journal of Family Therapy*, 46(5), 470-485.
- Bryant, L., Maney, J., & Martini, N. (2017). Changing perspectives of the role of community pharmacists: 1998 - 2012. *Journal of primary health care*, 9(1), 34–46. <https://doi.org/10.1071/HC16032>
- Bollen, A., Harrison, R., Aslani, P., & van Haastregt, J. C. (2019). Factors influencing interprofessional collaboration between community pharmacists and general practitioners—a systematic review. *Health & social care in the community*, 27(4), e189-e212. Bollen, A., Harrison, R., Aslani, P., & van Haastregt, J. C. (2019). Factors influencing interprofessional collaboration between community pharmacists and general practitioners—a systematic review. *Health & social care in the community*, 27(4), e189-e212.
- El-Awaisi, A., Joseph, S., El Hajj, M. S., & Diack, L. (2018). A comprehensive systematic review of pharmacy perspectives on interprofessional education and collaborative practice. *Research in Social and Administrative Pharmacy*, 14(10), 863-882.
- Montross, M., Douthit, S., Learn, L., Dombrowski, S. K., Hanna, C., & Gruver, B. (2023). Impact of interdisciplinary case management and pharmacist transitions of care interventions on 30-day readmissions. *Research in social & administrative pharmacy: RSAP*, 19(8), 1214–1217. <https://doi.org/10.1016/j.sapharm.2023.05.004>
- Lamparyk, K., Williams, A. M., Robiner, W. N., Bruschein, H. M., & Ward, W. L. (2022). Interprofessional education: Current state in psychology training. *Journal of clinical psychology in medical settings*, 1-11.

17. Collaborative, I. E. (2016). Core competencies for interprofessional collaborative practice: 2016 update.
18. Zorek, J., & Raehl, C. (2013). Interprofessional education accreditation standards in the USA: a comparative analysis. *Journal of Interprofessional Care*, 27(2), 123-130.
19. Leventhal, G., Stamm, K. E., Washburn, J. J., Rolston, C., Yozwiak, J. A., Hamp, A., ... & Robiner, W. N. (2021). Patterns of psychologists' interprofessional collaboration across clinical practice settings. *Journal of clinical psychology in medical settings*, 28(4), 844-867.
20. Ward, W., Zagoloff, A., Rieck, C., & Robiner, W. (2018). Interprofessional education: Opportunities and challenges for psychology. *Journal of Clinical Psychology in Medical Settings*, 25, 250-266.
21. Schot, E., Tummers, L., & Noordegraaf, M. (2020). Working on working together. A systematic review on how healthcare professionals contribute to interprofessional collaboration. *Journal of interprofessional care*, 34(3), 332-342.
22. Begun, J. W., White, K. R., & Mosser, G. (2011). Interprofessional care teams: the role of the healthcare administrator. *Journal of interprofessional care*, 25(2), 119-123.
23. Vatn, L., & Dahl, B. M. (2022). Interprofessional collaboration between nurses and doctors for treating patients in surgical wards. *Journal of Interprofessional Care*, 36(2), 186-194.
24. Labrague, L. J., Al Sabei, S., Al Rawajfah, O., AbuAlRub, R., & Burney, I. (2022). Interprofessional collaboration as a mediator in the relationship between nurse work environment, patient safety outcomes and job satisfaction among nurses. *Journal of nursing management*, 30(1), 268-278.
25. Dijkstra, N. E., De Baetselier, E., Dilles, T., Van Rompaey, B., da Cunha Batalha, L. M., Filov, I., ... & Sino, C. G. (2021). Developing a competence framework for nurses in pharmaceutical care: A Delphi study. *Nurse Education Today*, 104, 104926.
26. Yamamoto, K. (2022). Association Between Interdisciplinary Collaboration and Leadership Ability in Intensive Care Unit Nurses: A Cross-Sectional Study. *Journal of Nursing Research*, 30(2), e202.
27. Tillack, A. A., & Breiman, R. S. (2012). Renegotiating expertise: an examination of PACS and the challenges to radiology using a medical anthropologic approach. *Journal of the American College of Radiology*, 9(1), 64-68.
28. Fatahi, N., Krupic, F., & Hellström, M. (2019). Difficulties and possibilities in communication between referring clinicians and radiologists: perspective of clinicians. *Journal of Multidisciplinary Healthcare*, 555-564.
29. Burns, J., Agarwal, V., Jordan, S. G., Dallaghan, G. L. B., & Byerley, J. S. (2022). Interprofessional education-a mandate for today's radiology curriculum. *Academic radiology*, 29, S89-S93.
30. Kindle, K., Johnson, E., Kohler, A., & De Leo, G. (2023). Interprofessional education in US radiologic technologist programs: Results of a national survey. *Journal of Medical Imaging and Radiation Sciences*.
31. Wilson, D. (2022). Interdisciplinary collaboration: Data scientists and radiologists. *Veterinary Radiology & Ultrasound*, 63, 916-919.