

Awareness and Utilisation of Radiography Services in Companion Animal Care: A Survey of Veterinarians and Animal Caregivers in Osogbo, Osun State, Nigeria

Original Article

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ABSTRACT

Introduction: Radiography plays a critical role in enhancing diagnostic accuracy and therapeutic decision-making in companion animal care. However, its effective utilization depends largely on the awareness and accessibility of such services among veterinary professionals and animal caregivers.

Aim: This study assessed the level of awareness and utilization of radiography services in companion animal care in Osogbo, Osun State, Nigeria.

Methodology: A mixed-methods cross-sectional study was conducted among veterinarians, veterinary technicians, and animal caregivers involved in companion animal care in Osogbo, Osun State, Nigeria. Quantitative data were collected using a structured questionnaire assessing demographic characteristics, awareness, utilization patterns, and barriers to radiography services, while qualitative data were obtained through semi-structured interviews with a subset of participants. Descriptive statistical analysis and thematic analysis were employed for quantitative and qualitative data, respectively.

Results: Animal caregivers constituted the largest proportion of respondents (46.8%). Approximately 35.5% of participants had less than five years of professional experience, while 40% had more than ten years of experience. Although general awareness of radiography services was observed, significant gaps in knowledge and utilization were identified. Key barriers included limited understanding of the clinical benefits of radiography, high cost, and restricted access to diagnostic equipment.

Conclusion: The study reveals suboptimal awareness and utilization of radiography services in companion animal practice in Osogbo, with notable disparities across professional groups and experience levels. These findings highlight the need for targeted educational interventions and improved access to radiographic facilities.

Keywords: Radiography services, companion animal care, veterinarians, animal caregivers, Osogbo.

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Introduction

Radiography is a fundamental diagnostic modality in veterinary medicine, playing a critical role in improving diagnostic accuracy, guiding therapeutic decisions, and enhancing clinical outcomes in companion animal care. As a non-invasive imaging technique, radiography enables detailed evaluation of anatomical structures and facilitates the diagnosis of a wide range of conditions, including skeletal injuries, neoplastic processes, infectious diseases, and congenital abnormalities [1]. Its integration into routine veterinary practice has significantly advanced animal health management and reduced their morbidity and mortality globally [2].

Despite its well-documented clinical value, the awareness and utilization of radiography services remain suboptimal in many developing regions, including Nigeria. Studies have consistently shown that limited knowledge, inadequate access to diagnostic equipment, insufficient professional training, high operational costs, and misconceptions regarding radiation safety contribute to the underutilization of radiographic services in veterinary practice. Consequently, many veterinary clinics continue to rely predominantly on clinical examination alone, increasing the risk of diagnostic errors and delayed interventions [3, 4].

In low-resource settings such as Nigeria, challenges of gaps in education and training hinder the adoption of advanced diagnostic technologies in medical imaging [5]. In Osogbo, Osun State of Nigeria, socio-economic constraints and infrastructural limitations further restrict access to radiography services. Both veterinarians and animal caregivers may lack adequate understanding of the diagnostic and therapeutic benefits of radiographic examinations, which can adversely influence clinical decision-making and patient outcomes [6].

Notably, there is a paucity of empirical data assessing the level of awareness and utilization of radiography services among veterinary professionals and animal caregivers in Osogbo. This information gap limits evidence-based planning, policy formulation, and targeted capacity-building initiatives aimed at strengthening veterinary diagnostic services in the region. Therefore, this study seeks to generate evidence that will inform targeted educational programmes, policy

interventions, and resource allocation strategies, ultimately improving the quality of companion animal healthcare and veterinary practice in the region.

Methodology

This study employed a mixed-methods cross-sectional design to assess the level of awareness and utilisation of radiography services in companion animal care in Osogbo, Osun State, Nigeria. The study population comprised veterinarians, veterinary technicians, and animal caregivers actively involved in companion animal care. Participants were recruited using a purposive sampling technique to ensure inclusion of individuals with relevant professional experience. Quantitative data were collected using a structured, self-administered questionnaire designed to capture demographic characteristics, awareness levels, utilisation patterns, and perceived barriers to radiography services, while qualitative data were obtained through semi-structured, in-depth interviews conducted with a subset of respondents to explore experiences and challenges in greater detail. Questionnaires were administered in person, and interviews were conducted face-to-face following informed consent. Quantitative data were analyzed using descriptive statistics, including frequencies and percentages, whereas qualitative data were analyzed thematically to identify recurring patterns and key themes. Ethical approval was obtained from the Research Ethics Committee of UNIOSUN, and participant confidentiality was strictly maintained throughout the study.

Results

Table 1 presents the socio-demographic and professional characteristics of the respondents with animal caregivers constituting the largest proportion of participants (46.8%). Respondents were mainly affiliated with small animal clinics (41.9%), and had dogs as the most commonly owned pets (40.3%). Table 2 summarizes respondents' awareness and knowledge of radiography in companion animal care. Only a small proportion of respondents reported having received formal training in radiography (9.7%). Table 3 presents respondents' patterns of utilization and application of radiography in companion animal care, including frequency of use, common clinical indications, approval practices,

and limitations affecting utilization. Table 4 highlights the challenges encountered by respondents in the utilization of radiography services in companion animal care, with difficulty in image interpretation being the most frequently reported challenge (35.5%). Table 5 presents the thematic analysis of open-ended responses to the question, “What do you think are the limitations of radiography examination in companion animal care?” The responses revealed multiple perceived limitations affecting the effective use of radiography. The most frequently identified theme was accessibility and availability barriers, reported by 24.1% of respondents, highlighting challenges related to limited access to radiographic facilities and

services. Table 6 presents the results of the inferential analysis examining factors associated with awareness and utilization of radiography services among respondents. The analysis revealed no statistically significant association between professional role and knowledge and awareness of radiography services ($p = 0.055$). Table 7 presents respondents’ suggested strategies for improving awareness and utilization of radiography services in companion animal care. Education and outreach emerged as the most frequently cited strategy ($n = 21$), underscoring the perceived importance of structured educational programmes and professional engagement in promoting radiographic services.

Table 1: Socio-demographic and professional characteristics of the respondents

Variable	Category	Frequency	Percentage (%)
Professional role	Animal Caregiver	29	46.8
	Veterinarian	19	30.6
	Veterinary Technician	14	22.6
Years of experience	Less than 5 years	22	35.5
	5-10 years	15	24.2
	10-20 years	13	21.0
	More than 20 years	12	19.4
Type of facility	Animal shelter	22	35.5
	Research institution	14	22.6
	Small animal clinic	26	41.9
Pets owned	Cat	22	35.5
	Dog	25	40.3
	None	15	24.2
Animal caseload	Dogs	28	45.2
	Cats	25	40.3
	Other small animals (e.g., birds, rabbits)	22	35.5
	Large animals	14	22.6
	Domestic animals	1	1.6
Veterinary visits	Regularly (every 3-6 months)	16	25.8
	Occasionally (every 1-2 years)	14	22.6
	Only when my pet is sick	11	17.7
	Never	21	33.9

Table 2: Awareness and knowledge of Radiography in companion animal care

Variable	Category	Frequency	Percentage (%)
Self-rated knowledge of Radiography	Excellent	12	19.4
	Good	22	35.5
	Fair	16	25.8
	Poor	12	19.4
Received formal training in Radiography	Yes	6	9.7
	No	56	90.3
Familiarity with Radiography	Very familiar	25	40.3
	Somewhat familiar	20	32.3
	Not familiar at all	17	27.4
Sources of awareness	Formal training/school	24	38.7
	Friends or family	8	12.9
	Online research	13	21.0
	Companion animal owners	6	9.7
	Social media	11	17.7
Common indications for Radiography	Trauma	16	26.2
	Gastrointestinal diseases	19	31.1
	Respiratory diseases	26	42.6
	Broken bones	1	1.6
	Lameness	10	16.4
	I'm not sure	1	1.6
	I don't know	5	8.2

Table 3: The utilization and application of radiography in companion animal care, including frequencies, indications, and limitations

Variable	Category	Frequency	Percentage (%)
Utilisation frequency of Radiography	Weekly	7	11.3
	Monthly	15	24.2
	Yearly	8	12.9
	Rarely	32	51.6
Common conditions for the use of Radiography	Dental problems	3	4.8
	Foreign body detection	10	16.1
	Fractures	16	25.8
	Gastrointestinal disorders	10	16.1
	No idea	10	16.1
Approved Radiography for a case	No	47	75.8
	Yes	15	24.2
Reasons for non-approval	Cost concerns	11	17.7
	Lack of understanding of its benefits	11	17.7
	Nowhere to do it	8	12.9
	Recommendation not necessary	12	19.4
	Trust in other diagnostic methods	4	6.5
Equipment use	Digital radiography	23	37.1
	Film-based radiography	15	24.2
	No idea	24	38.7

Table 4: Challenges Encountered in the Utilisation of Radiography

Variable	Category	Frequency	Percentage (%)
Challenges Reported	Equipment limitations	14	22.6
	Image interpretation	22	35.5
	Patient positioning/size	15	24.2
	No idea	11	17.7

Table 5: The Analysis of Open-Ended Response to the Question: “What do you think are the limitations of radiography examination in companion animal care?”

Category	Themes	Frequency	Percentage (%)
Limitations	Accessibility & availability barriers	15	24.1
	Cost and financial constraints	10	16.1
	Knowledge and awareness gaps	6	9.7
	Safety concerns and misconceptions	4	6.5
	Technical/procedural limitations	2	3.2
	Negative perceptions (waste of time)	4	6.5

Table 6: Inferential analysis of factors associated with awareness and utilisation

Association Tested	p-value	Interpretation
Professional role × Knowledge and awareness	0.055	Not statistically significant
Years of experience × Utilization	0.526	Not statistically significant
Years of experience × Knowledge and awareness	0.643	Not statistically significant

Table 7: Suggested Strategies for improving awareness and utilization of Radiography services in companion animal care

Themes	Frequency
Education & outreach	21
Mass media/digital campaigns	16
Flyers/printed materials	12
Infrastructure & accessibility	6
Partnerships with influencers	2
Awareness/publicity	6
Training & manpower	6
Cost/affordability	3
Diagnostic value & precision	8
Improved health & well-being	7
Non-invasiveness	2
Enhanced owner awareness	2

Discussion

The findings of this study provide important insights into the socio-demographic characteristics, awareness, and utilization of radiography services among veterinarians and animal caregivers in Osogbo, Osun State. Overall, the results reveal a mixed pattern of awareness and practice, characterized by positive perceptions of radiography alongside notable barriers related to training, cost, accessibility, and inadequate publicity. When contextualized within existing literature, these findings highlight systemic challenges that may limit the optimal use of radiography in companion animal care in similar low-resource settings.

The predominance of animal caregivers among respondents (46.8%) underscores their pivotal role in companion animal healthcare delivery and decision-making. As primary observers of animal health status, caregivers often influence whether veterinary consultation and diagnostic imaging are pursued. However, limited awareness of the clinical value and safety of radiography among caregivers may restrict demand for imaging services [7].

This finding emphasizes the need for targeted public education and publicity efforts aimed at animal caregivers to improve informed utilization of radiography services [3]. The wide variation in years of professional experience observed among respondents suggests differing levels of confidence and engagement with radiographic imaging. Less experienced practitioners may be hesitant to request or interpret radiographs due to limited exposure, while more experienced professionals may rely on clinical judgment rather than imaging, particularly when access is constrained [8]. Tully et al. (2019) reported that professional experience significantly influences the uptake of diagnostic imaging, with training and institutional support playing critical moderating roles. These findings suggest that utilization barriers may not solely stem from awareness gaps but also from structural and professional constraints [6]. Despite these limitations, a notable proportion of respondents reported high familiarity with radiography. This discrepancy suggests reliance on informal learning and experiential knowledge, which may foster confidence but does not guarantee technical competence [4, 5].

Cost and affordability emerged as additional barriers influencing utilization. In settings where veterinary services are largely financed through out-of-pocket payments, the perceived or actual cost of radiographic examinations can deter both practitioners and animal caregivers. Financial constraints may lead caregivers to prioritize symptomatic treatment over diagnostic confirmation, reducing demand for imaging services. Similar observations have been reported in other low- and middle-income countries, where economic considerations significantly influence veterinary healthcare-seeking behavior [9].

Accessibility and infrastructure-related challenges also contribute to underutilization, albeit to a lesser extent in this study. Limited availability of functional radiographic equipment, irregular power supply, and insufficient imaging facilities may restrict routine use, particularly in smaller or privately owned clinics. While fewer respondents identified infrastructure as a primary concern, its influence cannot be overlooked, as access limitations often intersect with training and cost barriers to shape utilization patterns [10]. Respiratory diseases were identified as the most common indication for radiographic examination, reflecting the recognised

diagnostic value of radiography in thoracic conditions. Turner et al. (2016) highlighted radiography as an essential, non-invasive, and cost-effective tool for evaluating respiratory pathology in companion animals. However, the benefits of radiography, such as improved diagnostic precision and enhanced health outcomes, may not be fully realised in practice if awareness remains low and access is constrained [11].

Overall, the findings suggest that improving awareness and utilization of radiography services in companion animal care requires a multifaceted approach. Educational interventions targeting both veterinarians and animal caregivers, improved publicity and community engagement, expanded training and manpower development, and strategies to mitigate cost and access barriers are essential. Addressing these interconnected challenges will be critical to enhancing diagnostic capacity, promoting evidence-based veterinary practice, and improving health outcomes for companion animals in Osogbo and similar settings.

The study acknowledges several limitations that may impact the interpretation and generalizability of its findings. First, the sample size and representativeness present a concern, as the selected participants may not accurately reflect the broader population of veterinarians and animal caregivers in Osogbo, potentially introducing biases. Second, the reliance on self-reported data poses risks of inaccuracies, as respondents might provide socially desirable answers influenced by their personal experiences, which could compromise the validity of the data collected. These limitations highlight the need for future research to address these constraints for more comprehensive insights.

In conclusion, this study examined awareness and utilization of radiography services in companion animal care among veterinarians and animal caregivers in Osogbo, Osun State, Nigeria. Although radiography was widely recognized as a valuable diagnostic tool, particularly for respiratory conditions, its utilization remains suboptimal. Major barriers identified included inadequate formal training, limited public awareness, financial constraints, and challenges related to access and service publicity.

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