

ARTICLE

An Investigation into Radiography Students' Confidence and Perceived Competence in Caring for Neurodivergent Patients During Clinical Placement: A Pilot Cross-Sectional Study at a UK University

Syeda Tayyibah Ali ¹, Victor Chigbundu Nwaiwu ^{2,*}

¹ *Department of Radiography, Health Sciences University, United Kingdom*

² *School of Health and Rehabilitation Sciences, Department of Radiography, Health Sciences University, United Kingdom*

*Corresponding author. Email: Victor.ChigbunduNwaiwu@hsu.ac.uk, ORCID: 0009-0008-9981-6881

Received: 19 May 2026, Revised: 8 June 2026, Accepted: 12 June 2026, Published: 18 June 2026

Abstract

Neurodivergent patients may encounter heightened difficulties in radiography settings due to the necessity for swift communication, adaptability to unfamiliar apparatus, sensory processing requirements, and the capacity to maintain stillness during time-sensitive assessments. With person-centred care a professional expectation in radiography, limited evidence examines how prepared pre-registration radiography students feel when caring for neurodivergent patients during clinical placement. This cross-sectional mixed-methods study investigated radiography students' confidence and perceived competence in caring for neurodivergent patients during clinical placement, and compared student self-perceptions with radiographers' evaluations of student competence. Anonymous validated online questionnaires were completed by 20 radiography students and 11 radiographers. Quantitative data analysed descriptively using frequencies and percentages, while open-text responses were analysed thematically.

Students generally reported moderate confidence, particularly in understanding neurodiversity, using communication strategies, working with carers or family members, and seeking support from colleagues. However, 70% reported no formal teaching on neurodivergent patient care, and 60% disagreed or strongly disagreed that their education had provided sufficient knowledge in this area. Qualitative findings highlighted uncertainty around communication, distress management, sensory challenges, procedural adaptation, and limited formal preparation. Radiographers rated student competence more cautiously, with 72.7% rating overall student competence as only slightly competent. Cronbach's alpha values of 0.788 (students) and 0.801 (radiographers) was an indication of acceptable levels of reliability and internal consistency.

The findings suggest a gap between students' confidence and perceived practical readiness. More structured teaching, simulation, lived-experience input, communication training, sensory adaptation strategies, and supervised placement support are recommended to strengthen inclusive radiography education and improve preparedness for neurodivergent patient care.

Keywords: Neurodivergent patients; Student's confidence; Perceived competence; Clinical placement; Radiography education

1. INTRODUCTION

1.1. Context of the Research

Neurodivergence is increasingly recognised as an important consideration in healthcare because patients may differ in communication, sensory processing, attention, behaviour, emotional

regulation and responses to unfamiliar environments. The term is commonly used to describe naturally occurring differences in neurological development and functioning, including autism, attention-deficit/hyperactivity disorder, dyslexia, and dyspraxia [1-3].

These barriers are particularly relevant in radiography. Diagnostic imaging and radiotherapy departments can be unfamiliar, fast-paced, and sensory-intensive. Patients may need to understand instructions quickly, tolerate close physical positioning, remain still, cope with noise/ bright lighting, and engage with staff during brief but clinically important interactions [4,5]. For some neurodivergent patients, these demands may increase anxiety, distress, sensory overload or difficulty completing procedures, particularly when communication is unclear or reasonable adjustments are not made [6,7].

Inclusive radiographic practice, therefore, requires more than technical image acquisition or treatment delivery. It also requires flexible communication, awareness of sensory needs, appropriate involvement of carers or family members, and the ability to adapt procedures while maintaining safety, dignity and diagnostic or therapeutic quality [8,9]. This aligns with professional standards requiring radiographers to deliver safe, effective, person-centred and inclusive care, including consideration of service users' emotional, behavioural and psychological needs [10,11]. However, although inclusive practice is expected at the professional level, it cannot be assumed that pre-registration radiography students feel prepared to apply it confidently during clinical placement.

1.2. Relevance to Radiography Students and Clinical Placement

Clinical placement is central to radiography education because it allows students apply theoretical knowledge in real patient-facing environments. During placement, students develop technical skills, communication approaches, professional identity and confidence in clinical decision-making [12,13]. However, placement learning is also shaped by time pressure, hierarchy, unfamiliar expectations and the need to perform under supervision. This is especially relevant to neurodivergent patient care. Students may understand the general principle of person-centred care but still feel uncertain when a patient becomes distressed, overwhelmed, unable to remain still or unable to follow standard instructions. In these situations, students may need to adapt explanations, reduce sensory triggers, involve carers appropriately, slow communication, or seek support from qualified staff. Although wider healthcare literature has considered neurodivergent patients' experiences, radiography-specific evidence remains limited [14,15]. This matters because radiography has distinct sensory, procedural and time-sensitive demands. Student preparedness for neurodivergent patient care, therefore, requires specific investigation within radiography education and placement settings.

1.3. Confidence and Competence

A key issue in this study is the distinction between 'confidence' and 'competence'. Although these terms are sometimes used interchangeably, they describe different aspects of readiness. Confidence refers to an individual's belief in their ability to complete a task, whereas competence relates more directly to the quality, adequacy and effectiveness of performance in practice [16,17]. This distinction is important in healthcare education because students may feel confident in a general area of practice while still lacking the experience or applied skill needed to manage complex clinical situations safely and effectively [18,19].

For this reason, this study examines both student self-reported confidence and radiographers' perceptions of student competence. This dual perspective is important because students can provide insight into their own feelings of preparedness, while supervising radiographers can comment on how competence appears in clinical practice. Comparing these perspectives may help identify whether students' perceived confidence aligns with observed readiness, or whether there is a gap between how prepared students feel and how competent they appear to radiographers.

1.4. Research Gap and Significance of the Study

Despite increasing attention to inclusive healthcare, limited research has examined how prepared radiography students feel to care for neurodivergent patients during clinical placement [15,20]. Less attention has been given to whether students' self-reported confidence aligns with

radiographers' perceptions of student competence in practice. This gap is of importance because student self-assessment alone may not fully capture practical readiness, particularly when care requires judgement, adaptation and the management of distress.

Without clearer evidence, it is difficult to identify whether current educational preparation sufficiently supports students in caring for neurodivergent patients. It is also difficult to identify which areas students find most challenging, such as communication, sensory awareness, procedural adaptation or confidence in seeking support. This is relevant to radiography education because students are expected to develop inclusive, patient-centred practice before qualification. If students report moderate confidence but remain underprepared for complex neurodivergent patient interactions, this has implications for curriculum design, simulation, placement supervision and patient experience.

The significance of this study lies in its focus on both student and radiographer perspectives. By combining quantitative survey data with qualitative open-text responses, the study aims to identify not only the confidence levels reported by students but also the educational and clinical factors that may influence perceived preparedness. This provides a more detailed understanding of student readiness and may help inform future teaching, placement support, and inclusive practice development within radiography education.

1.5. Aim of the Study

This study aimed to investigate radiography students' confidence and perceived competence in caring for neurodivergent patients during clinical placement, and to compare students' self-perceptions with radiographers' evaluations of student competence in practice.

1.6. Objectives

The objectives of this study were to:

- (i) Explore radiography students' self-reported confidence in caring for neurodivergent patients during clinical placement;
- (ii) Identify educational, clinical and experiential factors that may influence students' confidence and perceived preparedness;
- (iii) Examine radiographers' perceptions of student competence in neurodivergent patient care;
- (iv) Compare student and radiographer perspectives to identify potential gaps between confidence and perceived competence;
- (v) Consider the implications of the findings for radiography education, clinical placement support and inclusive patient-centred care.

1.7. Research Questions

The following research questions guided this study:

- (i) How confident do radiography students feel when caring for neurodivergent patients during clinical placement?
- (ii) What factors do students perceive as influencing their confidence and preparedness in this area?
- (iii) How do radiographers perceive students' competence in caring for neurodivergent patients during clinical placement?
- (iv) To what extent do student self-perceptions align with radiographers' evaluations of student competence?

2. METHODOLOGY

2.1. Study Design

This study used a cross-sectional mixed-methods survey design to investigate radiography students' confidence and perceived competence in caring for neurodivergent patients during clinical placement. A cross-sectional approach was appropriate because the study aimed to capture participants' current views and perceived educational needs at one point in time, rather than measure change over time [21,22].

A mixed-methods approach was selected because the research questions required both measurable patterns and contextual explanation. Quantitative data identified trends in confidence, educational preparation and perceived competence, while qualitative open-text responses allowed participants to describe perceived challenges, support needs and clinical experiences in their own words [23,24]. This pragmatic design was suitable for a small-scale practice-based project because the methods were chosen according to their relevance to the research aim [25].

2.2. Participants and Sampling

Two participant groups were included. The first group consisted of undergraduate radiography students enrolled on either Diagnostic Radiography or Radiotherapy and Oncology programmes. Students were eligible to participate if they were aged 18 years or over and had completed, or were currently undertaking, a clinical placement. The second group consisted of registered radiographers, including diagnostic radiographers, therapeutic radiographers, senior radiographers and practice or clinical educators. Radiographers were eligible to participate if they were aged 18 years or over and had experience supervising, educating or working with students during clinical placement.

A non-probability voluntary sampling method was used. Participants were recruited through institutional and placement-related communication channels, including university and clinical education networks. This approach was appropriate for a small-scale undergraduate study requiring access to a specific participant group [26]. However, voluntary sampling may introduce self-selection bias, as individuals with stronger views, prior experience or interest in neurodivergent patient care may have been more likely to participate [27]. Therefore, the findings should be interpreted as exploratory rather than statistically generalisable. The final sample comprised 20 student responses and 11 radiographer responses. Although small, this was appropriate for an exploratory pilot-based study and allowed preliminary patterns to be identified across both groups.

2.3. Data Collection Instruments and Validation

Data were collected using two anonymous online questionnaires hosted on Jisc Online Surveys: one for students and one for radiographers. Online questionnaires were appropriate because they enabled anonymous participation, efficient data collection, and access to participants across university/ placement settings [28].

The student questionnaire collected demographic and background information, including year of study, course, placement experience, previous exposure to neurodivergent individuals, formal teaching, and frequency of interaction with neurodivergent patients. Likert-scale items explored knowledge of neurodiversity, communication confidence, procedural adaptation, sensory awareness, distress management, involvement of carers/ family members, and confidence in seeking support. Negatively worded items were included to reduce response pattern bias [29], and a scenario-based item improved clinical relevance by asking students to consider supporting an autistic patient distressed by noise and activity.

The radiographer questionnaire collected professional background information, including role, clinical experience, student supervision experience and previous training. Likert-scale items explored radiographers' perceptions of student competence across similar domains, including communication, rapport-building, sensory awareness, procedural explanation, environmental adaptation and seeking guidance. Using related domains across both questionnaires allowed student self-perceptions to be compared with radiographers' observations of practice [30].

A post-hoc Cronbach's alpha (α) test was conducted for both sets of questionnaires to establish validity and reliability. Questionnaires included open-ended questions, allowing participants to identify perceived challenges, additional training needs and reflections on neurodivergent patient care in radiography settings.

2.4. Procedure

Following ethical approval, recruitment materials containing the survey links were distributed through the university and placement-related communication channels. Participants accessed the survey electronically, after being presented with participant information sheet and consent information. They were informed of the study purpose, what participation involved, how data would be used, and their right to withdraw before submission.

Consent was obtained before participants could continue to the questionnaire. Participation was voluntary, and no incentives were offered. The estimated completion time was approximately 10-20 minutes. After completing the questionnaire, participants were presented with a debrief statement containing relevant contact information.

No personal information was collected, so responses were anonymous at the point of submission. Because responses could not be linked to individual participants, withdrawal was not possible after submission. This was explained before participation.

2.5. Data Analysis

Quantitative data were analysed descriptively using Jamovi. Frequencies and percentages were used to summarise categorical responses, including demographic characteristics, formal teaching, confidence ratings and radiographer competence ratings. Descriptive statistics (and not Inferential statistical testing) was undertaken because the sample was small to support reliable subgroup comparison or statistical generalisation.

Qualitative open-text responses were analysed thematically. Responses were read repeatedly to support familiarisation, before initial codes were generated from recurring ideas, concerns and examples. Codes were then grouped into broader themes and reviewed against the original responses to ensure they remained grounded in the data and relevant to the research questions. For the student responses, themes included communication and behavioural uncertainty, sensory and environmental challenges, practical and procedural difficulties, limited formal preparation, and patient-centred adaptation. For the radiographer responses, themes included student inexperience, lack of confidence, limited clinical exposure, time pressure, reliance on supervision and the need for structured training, and supervised practice. Thematic analysis was appropriate because the brief open-ended responses provided contextual detail and strengthened interpretation of the quantitative findings by identifying recurring explanations and practical concerns [31-33].

2.6. Ethical Considerations

The study was designed as a low-risk, anonymous educational survey. Ethical approval was obtained from Health Sciences University (HSU) Research Ethics Panel before recruitment and data collection. Participants received information about the study before consenting, including the voluntary nature of participation, the type of questions asked, data storage arrangements, and their right to withdraw before submission.

Anonymity was maintained by avoiding the collection of names, student numbers, staff identifiers, placement sites or patient-identifiable information. Data were stored securely on password-protected university OneDrive or SharePoint storage and were accessible only to the researchers. Because responses were anonymous at submission, participants were informed that withdrawal would not be possible after submission. Any qualitative quotations used in the dissertation were selected carefully to avoid identifiable information.

3. RESULTS

3.1. Overview of Analysis

A total of 31 study respondents (See Table 1 and Figure 1 for details) were included in the analysis. Quantitative findings are presented descriptively using frequencies and percentages, followed by qualitative themes from open-text responses.

Table 1. Study participants

Study Respondents	Number
Students	20
Radiographers	11
Total	31

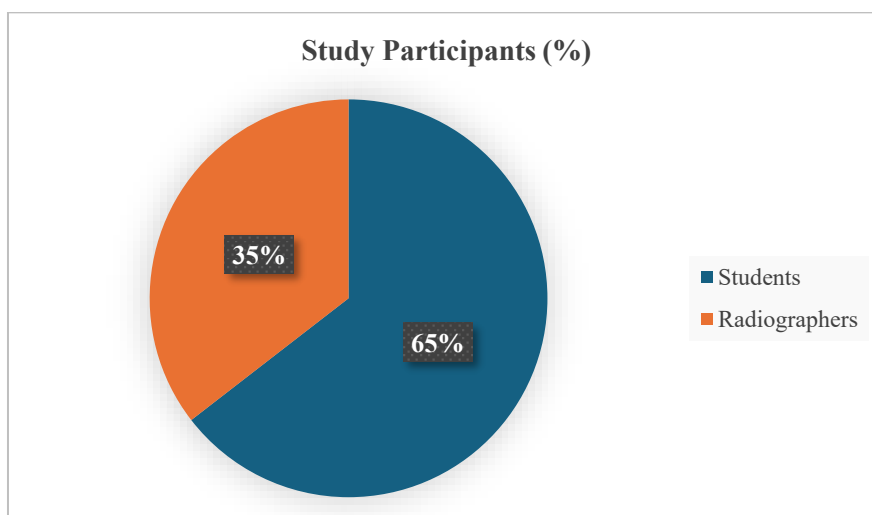


Figure 1. Study respondents expressed in percentage

3.2. Student Participant Characteristics

Twenty student responses were included. The sample was predominantly female and mainly consisted of Year 3 students. Both Diagnostic Radiography and Therapeutic Radiography and Oncology students were represented. Most students had completed 21-40 weeks of clinical placement. Formal teaching and clinical exposure were limited, with most students reporting no formal teaching and only limited interaction with neurodivergent patients during placement.

3.3. Student Confidence and Perceived Preparedness

Students reported confidence in several areas of neurodivergent patient care. Most agreed or strongly agreed that they understood the concept of neurodiversity (n = 16, 80%). Confidence was highest in relation to understanding how neurodivergence may influence patient behaviour during imaging or treatment procedures, with nineteen students agreeing or strongly agreeing (95%).

Communication-related confidence was also generally positive. Seventeen students (85%) agreed or strongly agreed that they felt confident using simplified or alternative communication strategies when required. Eighteen students (90%) agreed or strongly agreed that they felt confident working with carers or family members, and the same number agreed or strongly agreed that they felt confident seeking support from colleagues when needed.

However, findings relating to formal educational preparation were weaker. Twelve students (60%) disagreed or strongly disagreed that their education had provided sufficient knowledge about neurodivergent patient care. A further five students (25%) selected neutral, while only three students (15%) agreed. No students strongly agreed with this statement (See Figure 2).

Negatively phrased items also highlighted areas of uncertainty. Eleven students (55%) selected neutral or agree responses when asked whether they felt unsure communicating with neurodivergent patients. Twelve students (60%) selected neutral, agree or strongly agree responses in relation to feeling anxious when caring for neurodivergent patients. The same proportion reported neutral, agree or strongly agree responses in relation to feeling unprepared to adapt procedures.

Overall, students reported the strongest confidence in general awareness, communication, working with carers and seeking support, while confidence was weaker in distress management, procedural adaptation and independent judgement (See Table 2)

Table 2. Student strongest and weakest confidence findings

Area	Main result
Understanding neurodiversity	Agree/strongly agree n = 16, 80%
Understanding behaviour	Agree/strongly agree n = 19, 95%

Alternative communication strategies	Agree/strongly agree n = 17, 85%
Working with carers/family	Agree/strongly agree n = 18, 90%
Seeking support from colleagues	Agree/strongly agree n = 18, 90%
Education provided sufficient knowledge	Disagree/strongly disagree n = 12, 60%; neutral n = 5, 25%
Unsure communicating	Neutral/agree n = 11, 55%
Anxious when caring	Neutral/agree/strongly agree n = 12, 60%
Unprepared to adapt procedures	Neutral/agree/strongly agree n = 12, 60%

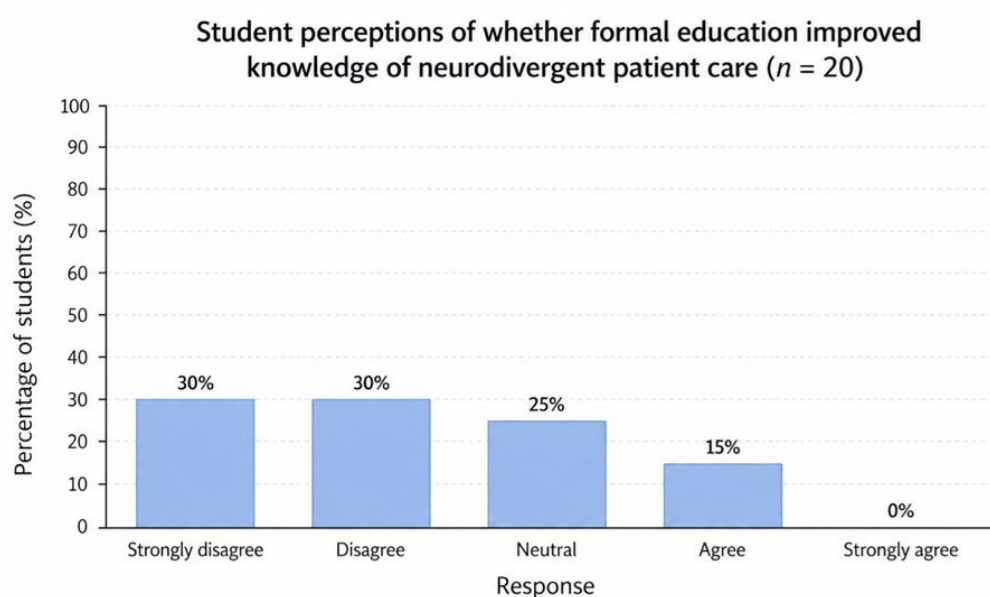


Figure 2. Student perceptions of whether formal education improved knowledge of neurodivergent patient care (n = 20)

3.4. Scenario-based and Overall Student Confidence

The scenario-based question asked students how confident they would feel supporting an autistic patient who became anxious due to noise and movement in the clinical environment. Nineteen students responded. Eight students reported feeling confident (42.1%), five reported feeling moderately confident (26.3%), and six reported feeling slightly confident (31.6%) (Table 3). For overall confidence in caring for neurodivergent patients during clinical practice, eleven students reported feeling confident (55%), six selected neutral (30%), and three reported feeling slightly unconfident (15%). No students selected not confident at all or very confident (Figure 3).

Table 4. Scenario-based and overall student confidence

Item	Result
Scenario confidence	Confident n = 8, 42.1%; moderately confident n = 5, 26.3%; slightly confident n = 6, 31.6%
Overall confidence	Confident n = 11, 55%; neutral n = 6, 30%; slightly unconfident n = 3, 15%

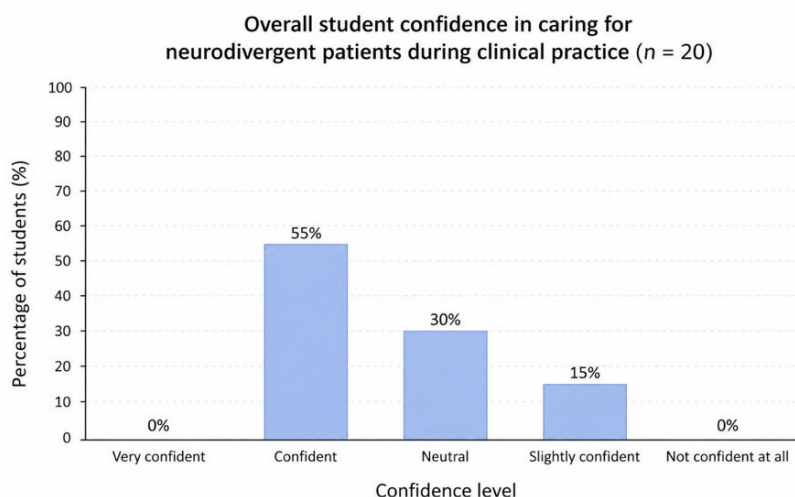


Figure 3. Overall student confidence in caring for neurodivergent patients during clinical practice (n = 20)

3.5. Student Qualitative Findings

Five themes were identified from the students’ open-text responses (Please refer Table 4 below).

The first theme, communication and behavioural uncertainty, reflected students’ concerns about supporting neurodivergent patients who were anxious, distressed, restless or unable to tolerate procedures. Students referred to patients who “can’t stay still or get upset” and described the difficulty of “helping to keep the patient still enough to receive treatment when they’re anxious”. Some responses showed empathy, with one participant describing “understandable uncooperativeness”, suggesting awareness that behaviour may reflect distress rather than deliberate refusal.

The second theme is related to sensory and environmental challenges. Students identified noise, unfamiliar surroundings, multiple staff members and busy clinical spaces as potential sources of overstimulation. One participant described a patient becoming “very overstimulated by a new environment”. Responses suggested that students recognised the importance of reducing sensory demands, although they did not always feel fully prepared to do this in practice.

The third theme was practical and procedural difficulty. Students described challenges with positioning, maintaining stillness, explaining procedures clearly and completing examinations or treatment within time-pressured environments. This theme showed that neurodivergent patient care was not viewed only as a communication issue, but also as something that could affect the practical delivery of radiography or radiotherapy procedures.

The fourth theme was limited formal preparation. Students repeatedly requested more teaching on neurodivergence, sensory needs, communication strategies and practical adjustments. One participant stated that students needed “more than just one lecture on this topic”, while another commented that “we just kind of have to learn as we go”.

The final theme was patient-centred adaptation. Students recognised that neurodivergent patients should not be treated as a single uniform group. One participant described neurodivergent care as “not a one size fits all situation, while another stated that “neurodiversity is a spectrum”.

Table 4. Summary of student qualitative themes

Theme	Example codes	Example quote
-------	---------------	---------------

Communication and behavioural uncertainty	Anxiety, distress, calming patients, uncertainty	"not knowing how best to calm them down"
Sensory and environmental challenges	Noise, activity, overstimulation, multiple staff	"very overstimulated by a new environment"
Practical and procedural difficulties	Positioning, staying still, time pressure	"difficulty staying still during imaging"
Limited formal preparation	Lack of teaching, learning as they go, need for simulation	"we just kind of have to learn as we go"
Patient-centred adaptation	Individualised care, flexibility, carers, compassion	"not a one size fits all situation"

3.6. Radiographer Participant Characteristics

Eleven radiographer responses were included. The sample included four Diagnostic Radiographers (36.4%), three Senior Radiographers (27.3%), three Practice or Clinical Educators (27.3%), and one Therapeutic Radiographer (9.1%).

Most radiographers had 0-5 years of clinical experience ($n = 8$, 72.7%). The sample also included one participant with 16-20 years of experience (9.1%) and two with more than 20 years of experience (18.2%). Most respondents supervised students for more than 12 weeks per year ($n = 9$, 81.8%).

Formal training in neurodivergent patient care was mixed. Five radiographers reported receiving formal training (45.5%), five reported no formal training (45.5%), and one was unsure (9.1%). Please see Table 5 for details.

Table 5. Radiographer participant characteristics

Variable	Main finding
Sample size	$n = 11$
Role	Diagnostic $n = 4$, 36.4%; Senior $n = 3$, 27.3%; Practice/Clinical Educator $n = 3$, 27.3%; Therapeutic $n = 1$, 9.1%
Clinical experience	0-5 years $n = 8$, 72.7%; 16-20 years $n = 1$, 9.1%; 20+ years $n = 2$, 18.2%
Supervision experience	1-3 years $n = 4$, 36.4%; more than 10 years $n = 3$, 27.3%
Weeks supervising per year	More than 12 weeks $n = 9$, 81.8%
Formal training	Yes $n = 5$, 45.5%; No $n = 5$, 45.5%; Not sure $n = 1$, 9.1%

3.7. Radiographer Perceptions of Student Competence

Radiographers generally perceived students as having some awareness of neurodiversity. Seven radiographers agreed that students demonstrated an understanding of neurodiversity (63.6%). The same number agreed that students could recognise when a patient may be neurodivergent (63.6%) and understood how neurodivergence may influence behaviour during imaging or treatment procedures (63.6%). However, ratings were more cautious in relation to communication and practical adaptation. Six radiographers disagreed that students appeared confident communicating with neurodivergent patients (54.5%), four selected neutral (36.4%), and only one

agreed (9.1%). For adapting communication style, seven radiographers selected neutral (63.6%) and four disagreed (36.4%). No radiographers agreed with this item.

Responses were also mixed for explaining procedures and building rapport. For both items, five radiographers disagreed (45.5%), three selected neutral (27.3%), and three agreed (27.3%). Students were rated more positively for seeking guidance, with all radiographers agreeing or strongly agreeing that students sought support from supervising radiographers when difficulties arose. Competence ratings by year group showed a clear pattern. Year 1 students were rated as not competent at all (n = 6, 54.5%) or slightly competent (n = 5, 45.5%). Year 2 students were mostly rated as slightly competent (n = 8, 72.7%), with two rated as moderately competent (18.2%) and one rated as not competent (9.1%). Year 3 students were more commonly rated as moderately competent (n = 6, 54.5%) or competent (n = 3, 27.3%), with two rated as slightly competent (18.2%). No students were rated as very competent.

Overall competence ratings were also cautious. Eight radiographers rated students as slightly competent overall (72.7%), two rated them as moderately competent (18.2%), and one rated them as competent (9.1%) (See Table 6 and Figure 4 below).

Table 6. Radiographer perceptions of student competence

Item	Main result
Students understand neurodiversity	Agree n = 7, 63.6%
Students appear confident communicating	Disagree n = 6, 54.5%; neutral n = 4, 36.4%; agree n = 1, 9.1%
Students adapt communication	Neutral n = 7, 63.6%; disagree n = 4, 36.4%
Students explain procedures	Disagree n = 5, 45.5%; neutral n = 3, 27.3%; agree n = 3, 27.3%
Students build rapport	Disagree n = 5, 45.5%; neutral n = 3, 27.3%; agree n = 3, 27.3%
Students seek guidance	Strongly agree n = 8, 72.7%; agree n = 3, 27.3%
Year 1 competence	Not competent n = 6, 54.5%; slightly competent n = 5, 45.5%
Year 2 competence	Slightly competent n = 8, 72.7%; moderately competent n = 2, 18.2%
Year 3 competence	Moderately competent n = 6, 54.5%; competent n = 3, 27.3%
Scenario competence	Slightly competent n = 8, 72.7%; moderately competent n = 2, 18.2%; competent n = 1, 9.1%
Overall competence	Slightly competent n = 8, 72.7%; moderately competent n = 2, 18.2%; competent n = 1, 9.1%

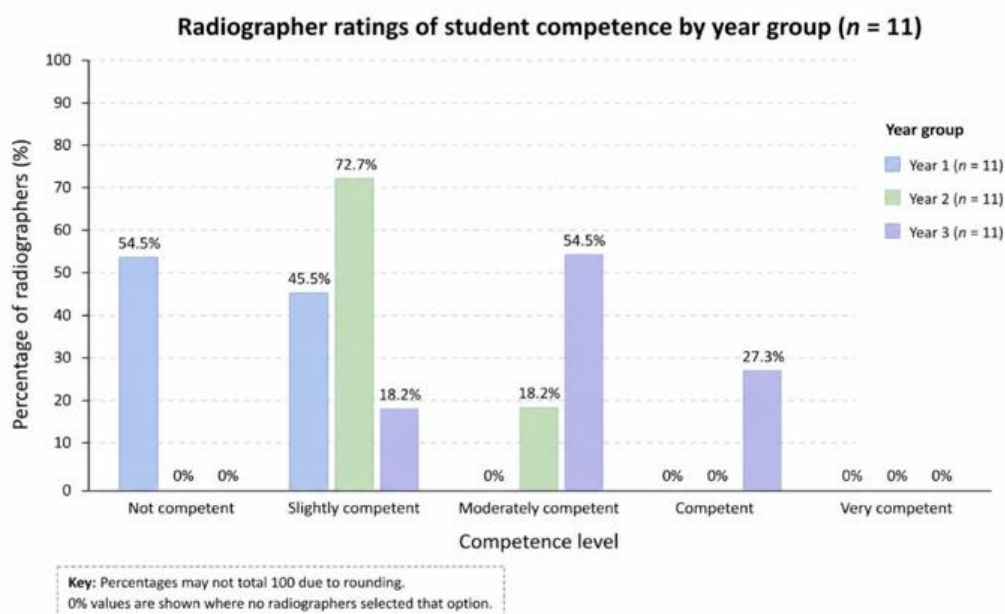


Figure 4. Radiographer ratings of student competence by year group (n = 11)

3.8. Radiographer Qualitative Findings

Six themes were identified from the radiographer open-text responses: student inexperience, lack of confidence, limited clinical exposure, time pressure, reliance on supervision, and the need for structured training and supervised practice (Table 7).

Radiographers frequently linked student competence to clinical experience. Earlier-year students were viewed as less prepared, particularly when managing unfamiliar or complex patient interactions. Radiographers also identified confidence as an issue, suggesting that students may understand neurodiversity in principle but appear less assured when communicating with or supporting neurodivergent patients in practice.

Limited exposure was another recurring theme. Radiographers suggested that students may not encounter enough neurodivergent patients during placement to develop consistent confidence or competence. Time pressure was also identified as a barrier, as busy clinical environments may reduce opportunities for students to practise adaptive communication, build rapport, or observe experienced radiographers making patient-centred adjustments.

Radiographers generally viewed students as willing to seek guidance, but responses also suggested that students often remained reliant on supervision when managing distress, sensory overload, or procedural difficulties. Radiographers recommended more structured teaching and supervised practice, including communication strategies, simulation, scenario-based learning, sensory awareness and environmental adaptation.

Table 7. Summary of radiographer qualitative themes

Theme	Example codes
Student inexperience	Limited exposure, early-stage learners, uncertainty
Lack of confidence	Nervousness, hesitation, awkward communication
Time pressure	Fast-paced departments, limited time for rapport
Reliance on supervision	Students looking to radiographers for support

Need for training	Simulation, adaptive techniques, communication strategies
Supervised practice	Debriefing, role modelling, reflective learning

3.9. Comparison between Student and Radiographer Findings

The comparison between student and radiographer findings showed both overlap and difference (Table 8). Students generally reported moderate confidence, particularly in communication strategies, working with carers or family members and seeking support. However, radiographers rated student competence more cautiously, especially in communication, procedural explanation, rapport building and sensory awareness.

One of the clearest differences was between students' overall confidence and radiographers' overall competence ratings. Just over half of students reported feeling confident overall when caring for neurodivergent patients during clinical practice ($n = 11$, 55%). In contrast, most radiographers rated students' overall competence as only slightly competent ($n = 8$, 72.7%).

A similar contrast was seen in relation to communication. Students reported confidence in using simplified or alternative communication strategies, while 54.5% of radiographers disagreed that students appeared confident communicating with neurodivergent patients. This indicates a possible difference between students' self-reported confidence and radiographers' perceptions of competence in practice. Despite this difference, both groups identified similar areas for development. Students and radiographers highlighted the need for more formal teaching, communication training, sensory awareness, scenario-based learning, practical adaptation strategies and supervised placement support.

Table 8. Comparison of student and radiographer findings

Area	Student finding	Radiographer finding
Overall confidence/competence	55% of students reported feeling confident overall	72.7% of radiographers rated students slightly competent overall
Communication	Students generally reported confidence in communication-related areas	54.5% of radiographers disagreed that students appeared confident communicating
Seeking support	90% of students agreed/strongly agreed they seek support	100% of radiographers agreed/strongly agreed students seek guidance
Training needs	Students requested lectures, simulation, workshops, and lived experience input	Radiographers requested structured teaching, adaptive techniques, supervision, and debriefing
Clinical exposure	Students reported limited encounters with neurodivergent patients	Radiographers identified limited exposure as a barrier to competence

Table 9. Post-hoc reliability analysis values for the pilot test (students)

Dimensions	Items	Cronbach's Alpha
Duration of clinical placement	1	0.737
Previous interaction and formal training	4	0.661
Frequency levels of interaction with neurodivergent patients	2	0.796

Knowledge on neurodiversity and neurodivergent	2	0.715
Behavioural influence of neurodivergent on patients	1	0.680
Overall confidence (positioning, examining, communication, support, decision making, and managing anxiety)	19	0.844
Uneasy feelings (unsure, anxious, unprepared)	4	0.871
Challenges experienced	1	0.888
Support /training needed, and others	2	0.903
Total	36	0.788

Table 9. Post-hoc reliability analysis values for the pilot test (radiographers)

Dimensions	Items	Cronbach's Alpha
Frequency levels of interaction with neurodivergent patients	1	0.738
Formal training to care for neurodivergent patients	2	0.645
Students' awareness/ understanding of neurodiversity	3	0.663
Students' competence (communication, positioning, adjusting, engagement, support, and decision making)	16	0.922
Students' challenges	1	0.937
Additional training / support needs of students	2	0.899
Total	25	0.801

A Cronbach's alpha of 0.788 and 0.801 for students and radiographers respectively (Table 8 and 9) generally indicates a highly satisfactory and acceptable internal consistency. This implies that the scale items in the questionnaires correlate well together and reliably measure the same underlying construct, strong enough to draw reliable conclusion.

4. DISCUSSION

4.1. Overview of Key Findings

This study explored radiography students' confidence and perceived competence in caring for neurodivergent patients during clinical placement, alongside radiographers' perceptions of student competence in practice. Overall, the findings suggest that students had developing awareness and moderate confidence in neurodivergent patient care, but this confidence was not consistently matched by perceived preparedness for more complex clinical situations.

Students reported confidence in understanding neurodiversity, recognising that neurodivergence may influence patient behaviour, using simplified communication strategies, working with carers or family members, and seeking support from colleagues. However, the findings also showed clear gaps in formal educational preparation. Most students reported receiving no formal teaching on neurodivergent patient care, and most disagreed or strongly disagreed that their education had provided sufficient knowledge in this area.

Radiographer findings gave a more cautious picture of student competence. Although radiographers generally recognised that students had some awareness of neurodiversity, they rated students less positively in relation to communication confidence, procedural explanation, rapport

building and sensory awareness. This contrast supports the central argument of the study: confidence and competence are related, but they are not the same.

4.2. Student Confidence: Developing Awareness but Uneven Preparedness

The student findings suggest that confidence was strongest in broad awareness and general communication skills. Most students reported understanding neurodiversity and felt confident using simplified or alternative communication strategies. This may indicate that students had developed some foundational knowledge through personal experience, general communication teaching, placement exposure or informal observation of qualified staff.

However, confidence became less secure when questions moved from general awareness to practical adaptation. Students reported uncertainty around communicating with distressed patients, managing anxiety, adapting procedures and responding to sensory overload. This distinction is important because neurodivergent patient care in radiography is not only about knowing what neurodiversity means. It also requires students to make practical decisions in real time, often in busy departments where image quality, patient safety, time pressure and emotional support must be balanced.

This finding links to wider literature on inclusive healthcare, which suggests that neurodivergent patients may experience barriers when services are not adapted to their communication, sensory and behavioural needs [34]. In radiography, this may be particularly significant because imaging and treatment environments can be noisy, unfamiliar and procedure-driven [35]. Students may therefore feel confident with the principle of inclusive care while still feeling unsure about how to apply it in practice.

The qualitative findings support this interpretation. Students described difficulties when patients became anxious, upset, overstimulated or unable to remain still. These responses suggest that students were aware of patient distress but did not always feel equipped to respond confidently. This indicates that the issue was not simply a lack of empathy. Rather, the gap appeared to be between awareness and practical preparedness.

4.3. Limited Formal Teaching and Reliance on Placement Learning

One of the clearest findings was the limited formal teaching reported by students. Seventy percent of students stated that they had not received formal teaching on neurodivergent patient care, while only one student reported that they had. This is important because professional standards expect radiographers to provide inclusive, person-centred and responsive care [10,11]. If students are expected to meet these standards by the point of qualification, neurodivergent patient care should not depend mainly on chance exposure during placement.

The qualitative data strengthened this point. Students described having to “learn as we go” and requested “more than just one lecture on this topic”. These comments suggest that current preparation may be inconsistent and may depend heavily on individual placement experiences, supervisors and patient encounters. This is problematic because students also reported limited exposure to neurodivergent patients, with most having encountered only 1-5 neurodivergent patients during placement. If exposure is limited and teaching is limited, students may have few opportunities to build confidence through repeated supervised practice.

A stronger educational approach would combine formal teaching with practical learning. This could include simulation, scenario-based learning, role-play, lived-experience teaching, and supervised reflection after clinical encounters. These approaches may help students move from theoretical awareness to applied confidence and competence.

4.4. Confidence is Not the Same as Competence

The strongest contribution of this study is the comparison between students’ self-reported confidence and radiographers’ perceptions of student competence. Students generally presented themselves as moderately confident, with 55% reporting overall confidence in caring for neurodivergent patients. However, radiographers rated student competence more cautiously, with 72.7% rating students as only slightly competent overall. This does not mean that students were overconfident or unsafe. A more balanced interpretation is that students may feel willing and reasonably confident to attempt neurodivergent patient care, while still requiring support to perform

competently in complex situations. This distinction matters because confidence refers to self-belief, whereas competence relates more closely to the quality and effectiveness of performance in practice [16,17].

The communication findings demonstrate this gap clearly. Students reported confidence in using simplified or alternative communication strategies, yet 54.5% of radiographers disagreed that students appeared confident communicating with neurodivergent patients. This difference may reflect the limitations of self-assessment. Students may judge confidence based on their intentions, knowledge or willingness to communicate, while radiographers may judge competence based on observable behaviour, adaptability and effectiveness during clinical encounters.

If educators only ask students whether they feel confident, they may miss areas where students need practical support. Similarly, if placement supervisors focus only on technical performance, they may overlook communication and sensory adaptation skills that are essential for inclusive care. The findings therefore support a more nuanced understanding of readiness, where confidence, competence and supervised practice are considered together.

4.5. Radiographer Perceptions: Competence Develops but Remains Limited

Radiographer ratings suggested that competence increased with year of study. Year 1 students were mostly rated as not competent or slightly competent, Year 2 students as slightly competent, and Year 3 students as moderately competent or competent. This pattern is expected, as students gain more clinical exposure and professional experience over time. However, no students were rated as very competent, and overall competence ratings remained cautious. This suggests that even later-stage students may still need further development in neurodivergent patient care. This is particularly relevant because many Year 3 students are close to qualification, and will soon be expected to practise with greater independence.

Radiographers also highlighted the role of supervision. Students were rated positively for seeking guidance, which is a strength because recognising when to ask for support is an important part of safe practice. However, reliance on supervision also suggests that students may not yet feel able to manage neurodivergent patient care independently, particularly where distress, sensory overload or procedural difficulties are present. This should not be interpreted negatively, as competence develops gradually through exposure, feedback, reflection and supported practice. However, students may need more structured opportunities to practise adaptive care before qualification.

4.6. Implications for Radiography Education and Practice

Overall, the study identifies a gap in radiography education and placement preparation. Neurodivergent patient care requires more than general communication skills. It requires applied strategies, clinical judgement, flexibility and supervised practice. Strengthening education in this area may improve student readiness and support more inclusive, person-centred care in radiography settings. This includes communication strategies, sensory awareness, distress management, reasonable adjustments, environmental adaptation and appropriate involvement of carers or family members.

The findings suggest that neurodivergent patient care should be made more visible within radiography curricula. Rather than being addressed only through broad communication or equality and diversity teaching, students need specific preparation in sensory differences, communication preferences, distress responses, reasonable adjustments and practical adaptation within imaging and radiotherapy environments.

Teaching should also be practice focused. A more practical and clinically relevant teaching such as simulation, role-play and scenario-based learning could allow students practise supporting patients who may become distressed, overstimulated, anxious, or unable to tolerate standard procedures before encountering similar situations in placement. Lived-experience input from neurodivergent individuals, carers or patient advocates may also help students understand how radiography environments are experienced from the patient perspective.

Placement support is equally important. Supervising radiographers could support learning by modelling adaptive communication, discussing relevant cases and encouraging structured

reflection after patient interactions. Study findings also suggest that qualified radiographers may benefit from further training, as staff preparation was inconsistent, which can negatively affect the support student receive.

4.7. Strengths and Limitations

A key strength of this study is its dual-perspective design. By including both students and radiographers, the study was able to compare self-reported confidence with professional perceptions of competence. This strengthened the analysis and helped highlight the gap between perceived confidence and practical readiness. Again, a reliability /validity testing of the questionnaires developed meant that findings as well as conclusions drawn are valid. Another strength is the mixed-methods approach. Quantitative data identified patterns across both participant groups, while qualitative responses provided context and helped explain why confidence or competence may be limited. The inclusion of scenario-based questions also improved clinical relevance by asking participants to consider realistic placement situations.

However, the study has limitations. The sample size was small, and all participants drawn from a single university context. Therefore, the findings cannot be statistically generalised to all radiography students or radiographers. The voluntary sampling method may also have introduced self-selection bias, as participants with stronger views or greater interest in neurodivergent patient care may have been more likely to respond. Student's confidence was self-reported, and radiographer competence ratings were based on perception rather than direct objective observation of clinical performance. The qualitative data were also limited by the short nature of open-text survey responses, meaning that some themes could not be explored in the depth that interviews might have allowed.

4.8 Discussion Summary

This study identified a gap between student confidence and radiographer-perceived competence. Students showed developing awareness, but limited formal teaching, limited exposure and uncertainty around practical adaptation affected preparedness. These findings support the need for more structured, practice-focused teaching and placement support.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

This study investigated radiography students' confidence and perceived competence in caring for neurodivergent patients during clinical placement, and compared student self-perceptions with radiographers' evaluations of student competence. The findings suggest that students had developing awareness and moderate confidence, particularly in understanding neurodiversity, using simplified communication strategies, working with carers or family members and seeking support from colleagues. However, this confidence was not consistently matched by perceived practical readiness.

Radiographers viewed student competence more cautiously. Although students were perceived to have some awareness of neurodiversity, radiographers rated them less positively in relation to communication confidence, procedural explanation, rapport-building, sensory awareness and environmental adaptation. This supports the central conclusion of the study: confidence and competence are related but distinct. Students may feel willing and moderately confident to support neurodivergent patients, while still requiring structured teaching, supervision, and practical experience to develop competence.

In all, it is important to emphasise the preliminary nature of study findings, with a call for multi-site replication with larger samples.

5.2. Recommendations

The study indicates the need to embed more structured teaching on neurodivergent patient care in Radiography programmes and strengthen clinical placement support through supervisor modelling, case discussion, and structured reflection after relevant patient encounters.

However, before broader implementation, it is highly recommended that future research should include larger samples across multiple universities and placement sites to explore whether these findings are reflected more widely across radiography education. Differences by year group, course type, placement experience or prior exposure to neurodivergent individuals could be further explored. In addition, qualitative interviews or focus groups would allow deeper exploration of student and radiographer experiences. Observational research may also be valuable, as it could assess competence in practice more directly rather than relying only on self-reported confidence or perceived competence.

Author	Contributions
Syeda	Conceptualization, Software, Formal analysis, Investigation, Data curation, Resources, Writing - original draft
Victor	Methodology, Validation, Funding acquisition, Writing - review & editing, Visualization, Supervision, Project administration

Acknowledgement: The authors would like to thank all radiography students at Health Sciences University, as well as our clinical partners and Radiographer colleagues at the various placement sites for their invaluable support and willingness to participate in our research pilot study.

Funding: The authors did not receive any financial support for this research, authorship and publication of this article.

Conflict of Interest: The authors declare that they have no competing interest.

Supplementary Materials: Appendix A and B attached provides details on the questionnaire template utilised.

Consent for Publication: The authors give consent for publication of this work.

Availability of Data: Data used for this review is available from the corresponding author on reasonable request.

REFERENCES

- [1] Dwyer, P. (2022). The neurodiversity approach(es): What are they and what do they mean for researchers? *Human Development*, 66(2), 73-92. <https://doi.org/10.1159/000523723>
- [2] Shaw, S. C. K., Carravallah, L., Johnson, M., O'Sullivan, J., Chown, N., Neilson, S., & Doherty, M. (2023). Barriers to healthcare and a "triple empathy problem" may lead to adverse outcomes for autistic adults: A qualitative study. *Autism*, 28(7). <https://doi.org/10.1177/13623613231205629>
- [3] Shelton, N., Abdinor, S., & Lodder, A. (2025). Associations between neurodivergence, learning disabilities and metabolic syndrome risk: Evidence from the Health Survey for England. *Journal of Public Health*. <https://doi.org/10.1093/pubmed/fdaf027>
- [4] Stogiannos, N., Harvey-Lloyd, J. M., Brammer, A., Cleaver, K., McNulty, J. P., dos Reis, C. S., Nugent, B., Simcock, C., O'Regan, T., Bowler, D., Parveen, S., Marais, K., Pavlopoulou, G., Papadopoulou, C., Gaigg, S. B., & Malamateniou, C. (2023). Toward autism-friendly magnetic resonance imaging: Exploring autistic individuals' experiences of magnetic resonance imaging scans in the United Kingdom, a cross-sectional survey. *Autism in Adulthood*, 5(3). <https://doi.org/10.1089/aut.2022.0051>
- [5] Makanjee, C. R., Bergh, A.-M., Xu, D., & Sarwat, D. (2021). Creating personal space for unspoken voices during diagnostic medical imaging examinations: A qualitative study. *BMC Health Services Research*, 21(1). <https://doi.org/10.1186/s12913-021-06958-4>

- [6] Strömberg, M., Liman, L., Bang, P., & Igelström, K. (2021). Experiences of sensory overload and communication barriers by autistic adults in health care settings. *Autism in Adulthood*, 4(1). <https://doi.org/10.1089/aut.2020.0074>
- [7] Wickramasinghe, R., & McLean, G. (2025). Improving procedure completion and engagement of neurodivergent patients in medical imaging: A systematic review. *Journal of Medical Radiation Sciences*. <https://doi.org/10.1002/jmrs.70023>
- [8] Taylor, A., Bleiker, J., & Hodgson, D. (2021). Compassionate communication: Keeping patients at the heart of practice in an advancing radiographic workforce. *Radiography*, 27(1). <https://doi.org/10.1016/j.radi.2021.07.014>
- [9] Hedlund, Å., Andersson, A., Lindberg, M., & Jordal, M. (2025). Experiences and perceptions of physical healthcare among adult autistic patients: A scoping review. *International Journal of Nursing Studies Advances*, 9(1), 100366. <https://doi.org/10.1016/j.ijnsa.2025.100366>
- [10] Health & Care Professions Council. (2023, September 1). *The standards of proficiency for radiographers*. <https://www.hcpc-uk.org/standards/standards-of-proficiency/radiographers/>
- [11] Health and Care Professions Council. (2024, September 1). *Standards of conduct, performance and ethics*. <https://www.hcpc-uk.org/standards/standards-of-conduct-performance-and-ethics/>
- [12] Bourne, E., Short, K., Kenny, B., & McAllister, L. (2021). Clinical educators can supervise students without increased stress: A study of interacting factors using insights from complexity theory. *Advances in Health Sciences Education*, 27(1), 125-145. <https://doi.org/10.1007/s10459-021-10075-6>
- [13] Carlier, S., Vorlet, P., Sá dos Reis, C., & Malamateniou, C. (2022). Strategies, challenges and enabling factors when imaging autistic individuals in Swiss medical imaging departments. *Journal of Medical Imaging and Radiation Sciences*, 54(4). <https://doi.org/10.1016/j.jmir.2022.11.002>
- [14] Marterosyan, J., & Gooch, J. (2023). Neurodivergence and radiology: How medical professionals can optimise the standard of care provided to autistic paediatric patients. *Radiography*, 29(4), 680-683. <https://doi.org/10.1016/j.radi.2023.04.017>
- [15] Hamdan, S. Z., & Bennett, A. (2024). Autism-friendly healthcare: A narrative review of the literature. *Cureus*, 16(7). <https://doi.org/10.7759/cureus.64108>
- [16] Jha, P., Sharma, B., Ponnusamy, P., Sahoo, P. C., Jha, V. K., Kathuria, N., Mehra, D., Gupta, S., Pandey, A., Chahar, R., McConville, F. E., Gandhi, M., & Bogren, M. (2024). Developing and validating a tool for assessing the confidence in the competence of midwifery tutors in India on WHO core competency domains. *PLOS Global Public Health*, 4(8), e0003626. <https://doi.org/10.1371/journal.pgph.0003626>
- [17] Hooper, G. A., Butler, A. M., Guidry, D., Kumar, N., Brown, K., Beninati, W., Brown, S. M., & Peltan, I. D. (2024). Relationship between resuscitation team members' self-efficacy and team competence during in-hospital cardiac arrest. *Critical Care Explorations*, 6(1), e1029. <https://doi.org/10.1097/cce.0000000000001029>
- [18] Scott, R., Monaghan, E., Chebsey, D., Meighan-Davies, S., & Gebbett, C. (2024). Simulation-based education at level 4: The role of multidisciplinary team input in the design and facilitation of a simulated radiographic placement. *Radiography*. <https://doi.org/10.1016/j.radi.2024.11.017>
- [19] Wilkinson, E., Gill, A., & Hardy, M. (2023). What do the revised UK standards of proficiency mean for diagnostic radiography training? A regional radiographer focus group study. *Radiography*, 30(1), 375-381. <https://doi.org/10.1016/j.radi.2023.12.007>
- [20] O'Connor, M., & McNulty, J. (2024). Radiography students' viewpoints of the clinical learning environment: A cross-sectional study. *Radiography*, 30(1), 367-374. <https://doi.org/10.1016/j.radi.2023.12.005>
- [21] Rana, K., & Chimoriya, R. (2025). A guide to a mixed-methods approach to healthcare research. *Encyclopedia*, 5(2), 51. <https://doi.org/10.3390/encyclopedia5020051>
- [22] Guerrero, E. E. P., Medina, M. R. G., Sandoval, F. M., Cruz, J. M. V., Arreola, M. P. G., Méndez, M. A. R., Velázquez, J. A. A., & Hurtado, I. A. G. (2024). Methodological and

- statistical considerations for cross-sectional, case-control, and cohort studies. *Journal of Clinical Medicine*, 13(14), 4005. <https://doi.org/10.3390/jcm13144005>
- [23] Creswell, J. W. (2024). My 35 years in mixed methods research. *Journal of Mixed Methods Research*, 18(3). <https://doi.org/10.1177/15586898241253892>
- [24] Kowalski, C. P., Finley, E. P., & Hamilton, A. B. (2025). Optimizing qualitative methods in implementation research: A resource for editors, reviewers, authors, and researchers to dispel ten common misperceptions about qualitative research methods. *Implementation Science*. <https://doi.org/10.1186/s13012-025-01474-z>
- [25] Nightingale, J., & Stewart-Lord, A. (2025). Mixed methodology: A pragmatic approach to investigating complexity in radiography research. *Radiography*, 32(1), 103257. <https://doi.org/10.1016/j.radi.2025.103257>
- [26] Hochberg, C. H., & Eakin, M. N. (2024). Keys to successful survey research in health professions education. *ATS Scholar*, 5(1), 206-217. <https://doi.org/10.34197/ats-scholar.2023-0112re>
- [27] Masters, K., Correia, R., Nemethy, K., Benjamin, J., Carver, T. E., & MacNeill, H. (2023). Online learning in health professions education. Part 2: Tools and practical application: AMEE Guide No. 163. *Medical Teacher*, 1-16. <https://doi.org/10.1080/0142159x.2023.2259069>
- [28] Mason, P., Augustyn, M., & Seakhoa-King, A. (2009). Exploratory study in tourism: Designing an initial, qualitative phase of sequenced, mixed methods research. *International Journal of Tourism Research*, 12(5). <https://doi.org/10.1002/jtr.763>
- [29] García-Fernández, J., Postigo, Á., Cuesta, M., González-Nuevo, C., Menéndez-Aller, Á., & García-Cueto, E. (2022). To be direct or not: Reversing Likert response format items. *The Spanish Journal of Psychology*, 25(1), e24. <https://doi.org/10.1017/SJP.2022.20>
- [30] Kiely, R., & Hartman, E. (2023). Qualitative research methodology and international service learning. <https://doi.org/10.4324/9781003445371-16>
- [31] Hemming, K., Kudrna, L., Watson, S., Taljaard, M., Greenfield, S., Goulao, B., & Lilford, R. (2024). Interpretation of statistical findings in randomised trials: A survey of statisticians using thematic analysis of open-ended questions. *BMC Medical Research Methodology*, 24(1). <https://doi.org/10.1186/s12874-024-02366-4>
- [32] Ahmed, S. K., Mohammed, R. A., Nashwan, A. J., Ibrahim, R. H., Abdalla, A. Q., Ameen, B. M. M., & Khidhir, R. M. (2025). Using thematic analysis in qualitative research. *Journal of Medicine, Surgery, and Public Health*, 6(6), 100198. <https://doi.org/10.1016/j.glmedi.2025.100198>
- [33] Fraser, G. (2024). Open-ended survey questions. *Cambridge University Press EBooks*, 2(1), 547-570. <https://doi.org/10.1017/9781009000796.025>
- [34] Habib, M. (2021). The neurological basis of developmental dyslexia and related disorders: A reappraisal of the temporal hypothesis, twenty years on. *Brain Sciences*, 11(6), 708. <https://doi.org/10.3390/brainsci11060708>
- [35] Li, W., Hacid, H., Almazrouei, E., & Debbah, M. (2023). A comprehensive review and a taxonomy of edge machine learning: Requirements, paradigms, and techniques. *AI*, 4(3), 639-674. <https://doi.org/10.3390/ai4030039>

APPENDIX

Appendix A: Radiography Students' Confidence in Caring for Neurodivergent Patients During Clinical Placement Student survey

Radiography Students' Confidence in Caring for Neurodivergent Patients During Clinical Placement

1. You are invited to participate in a research study exploring radiography students' confidence in caring for neurodivergent patients during clinical placements.

Participation is voluntary and all responses will remain anonymous and confidential. You may withdraw from the study at any time before submitting your responses.

By continuing with this questionnaire, you confirm that:

- You are a radiography student
- You are aged 18 years or older
- You consent to participate in this research study

* Tick if you consent to all the above

2. Please enter your current age

18-20

21-24

25-29

30-34

35+

3. Gender

Male

Female

Non-binary

Prefer not to say

4. Year of study*

Year 1

Year 2

Year 3

5. The course you study *

Diagnostic Radiography

Therapeutic Radiography and Oncology

6. How many weeks of clinical placement have you completed?

0-10 weeks

11-20 weeks

21-40 weeks

41+ weeks

7. Before starting your radiography course, had you previously interacted with or supported neurodivergent individuals (e.g., autism, ADHD, dyslexia, or other neurodivergent conditions)?

Yes - personal experience (family member or friend)

Yes - educational or work experience

Yes - both personal and educational/work experience

No

Prefer not to say

8. Have you received formal teaching about neurodivergent patient care during your course?

Yes

No

- Not sure
9. How often have you interacted with neurodivergent patients during clinical placement?
- Never
- Rarely
- Sometimes
- Often
- Very often
10. Approximately how many neurodivergent patients have you encountered during clinical placements?
- None
- 1-5 patients
- 6-10 patients
- More than 10 patients
11. Please indicate how much you agree with the following statements based on your clinical experiences.
- Response scale:
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
- I understand the concept of neurodiversity.
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
12. I understand how neurodivergence may influence patient behaviour during imaging procedures.
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
13. I feel confident recognising signs that a patient may be neurodivergent.
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
14. I feel confident identifying when a neurodivergent patient may require additional support.
- Strongly disagree

- Disagree
 - Neutral
 - Agree
 - Strongly agree
15. My education has provided me with sufficient knowledge about neurodivergent patient care.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
16. I feel confident communicating with neurodivergent patients.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
17. I feel confident explaining radiographic procedures clearly to neurodivergent patients.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
18. I feel confident adapting my communication style when interacting with neurodivergent patients.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
19. I feel confident using simplified or alternative communication strategies when required.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
20. I feel confident ensuring that neurodivergent patients understand the procedure.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree

- Strongly agree
21. I feel confident building rapport with neurodivergent patients.
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
22. I feel confident managing patient anxiety or distress during procedures.
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
23. I feel confident supporting neurodivergent patients throughout the examination.
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
24. I feel confident working with carers or family members when appropriate.
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
25. I feel confident recognising sensory sensitivities such as noise or bright lighting.
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
26. I feel confident modifying the environment to reduce sensory stress.
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree
27. I feel confident adjusting procedures to accommodate patient comfort.
- Strongly disagree

- Disagree
 - Neutral
 - Agree
 - Strongly agree
28. I feel confident positioning neurodivergent patients for procedures.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
29. I feel confident completing examinations with neurodivergent patients.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
30. I feel confident adapting radiography procedures to meet individual patient needs.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
31. I feel confident seeking support from colleagues when needed.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
32. I feel confident making patient-centred decisions when challenges arise.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
33. I feel confident advocating for adjustments that benefit neurodivergent patients.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree

Strongly agree

34. I feel unsure about how to communicate with neurodivergent patient.

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

35. I feel anxious when caring for neurodivergent patients.

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

36. I feel unprepared to adapt procedures for neurodivergent patients.

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

37. Please read the scenario below.

You are preparing to perform on a patient with autism who appears anxious due to noise and activity in the room.

How confident would you feel managing this situation?

Not confident at all

Slightly confident

Moderately confident

Confident

Very confident

38. Overall, how confident do you feel caring for neurodivergent patients during clinical practice?

Very unconfident

Slightly unconfident

Neutral

Confident

Very confident

39. What challenges have you experienced when caring for neurodivergent patients during clinical placement?

0/32,000 characters

40. What type of training or support would improve your confidence when working with neurodivergent patients?

0/32,000 characters

Appendix B: Radiographers' Perspectives on Student Preparedness for Neurodivergent Patient Care

Radiographers' Perspectives on Student Preparedness for Neurodivergent Patient Care

1. You are invited to participate in a research study exploring radiography students' confidence and competence when caring for neurodivergent patients during clinical placements. This questionnaire aims to gather the perspectives of link radiographers and clinical educators who supervise radiography students. Participation is voluntary, and all responses will remain anonymous and confidential. You may withdraw from the study at any time before submitting your responses. By continuing with this questionnaire, you confirm that:
 - You are a registered radiographer
 - You supervise radiography students during clinical placement
 - You are aged 18 years or over
 - You consent to participate in this study ** Tick if you consent to all the above
2. Your professional Role*
 - Diagnostic Radiographer
 - Therapeutic Radiographer
 - Senior Radiographer
 - Practice Educator / Clinical Educator Other
3. Years of Clinical Experience *
 - 0-5 years
 - 6-10 years
 - 11-15 years
 - 16-20 years
 - 20+ years
4. How long have you supervised radiography students? *
 - Less than 1 year
 - 1-3 years
 - 4-6 years
 - 7-10 years
 - More than 10 years

5. Approximately how many weeks per year do you supervise radiography students during clinical placement?
- 1-4 weeks
 - 5-8 weeks
 - 9-12 weeks
 - More than 12 weeks
6. How often do you encounter neurodivergent patients in your clinical practice?
- Rarely
 - Occasionally
 - Sometimes
 - Frequently
 - Very frequently
7. Have you received any formal training related to caring for neurodivergent patients?
- Yes
 - No
 - Not sure
8. Please indicate how much you agree with the following statements regarding radiography students during clinical placement.
- Response scale:
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
- Radiography students demonstrate an understanding of neurodiversity.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
9. Students appear able to recognise when a patient may be neurodivergent.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
10. Students demonstrate awareness of how neurodivergence may influence patient behaviour during imaging procedures.
- Strongly disagree
 - Disagree
 - Neutral

- Agree
 - Strongly agree
11. Students appear confident communicating with neurodivergent patients.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
12. Students adapt their communication style when interacting with neurodivergent patients.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
13. Students clearly explain procedures to neurodivergent patients.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
14. Students demonstrate the ability to build rapport with neurodivergent patients.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
15. Students support patients who become anxious or distressed during procedures.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
16. Students involve carers or family members appropriately when necessary.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
17. Students demonstrate awareness of sensory sensitivities such as noise or bright lighting.

- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
18. Students attempt to adjust the clinical environment to reduce patient discomfort where possible.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
19. Students appear competent positioning neurodivergent patients for procedures.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
20. Students adapt procedures when necessary to accommodate patient needs.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
21. Students seek guidance from supervising radiographers when challenges arise.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
22. Students demonstrate patient-centred decision making when caring for neurodivergent patients.
- Strongly disagree
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
23. Based on your experience supervising students, how competent do students typically appear when interacting with neurodivergent patients at different stages of their training?
Response scale:
- Not competent
 - Slightly competent

- Moderately competent
- Competent
- Very competent

Year 1 students

- Not competent at all
- Slightly competent
- Moderately competent
- Competent
- Very competent

24. Year 2 students

- Not competent at all
- Slightly competent
- Moderately competent
- Competent
- Very competent

25. Year 3 students

- Not competent at all
- Slightly competent
- Moderately competent
- Competent
- Very competent

26. Please read the scenario below.

A student radiographer is preparing to perform a radiographic procedure on a patient with autism who appears distressed due to noise and activity within the clinical environment.

How competent do you believe most students would be in managing this situation?

- Not competent at all
- Slightly competent
- Moderately competent
- Competent
- Very competent

27. Based on your experience supervising radiography students during clinical placement:

Overall, how competent do radiography students appear to be when caring for neurodivergent patients?

- Not competent at all
- Slightly competent
- Moderately competent
- Competent
- Very competent

28. From your experience, what challenges do radiography students face when caring for neurodivergent patients?

0/32,000 characters

29. What additional training or support would help students feel more confident and competent in this area?

0/32,000 characters

30. Do you have any additional comments regarding radiography students' preparedness to care for neurodivergent patients?

0/32,000 characters