



Explaining the practicum experiences of diagnostic radiography undergraduates in Australia and Ethiopia using the theory of human relatedness



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ARTICLE INFO

Article history:

Received 14 September 2023

Received in revised form

19 December 2023

Accepted 9 January 2024

Keywords:

Clinical placement

Practicum

Self-efficacy

Skills assessment

Student retention

Theory of human relatedness

ABSTRACT

Introduction: Practice learning is critical to the development of clinical skills; hence placements are a major component of all pre-registration radiography programmes. Nonetheless, dissatisfaction with practicum experiences is a common reason why students consider leaving such programmes. Providing effective placements which promote retention may not only require better appreciation of students' clinical reflections, but also a more fundamental understanding of the implicit criteria they use to appraise a practicum. This study applied the theory of human relatedness (THR) to the placement experiences of radiography undergraduates to identify the evaluative mechanisms which may underpin these experiences.

Methods: A critical realist investigative approach was employed to reanalyse data regarding the practicum experiences of stakeholders involved in undergraduate diagnostic radiography programmes at two universities in Australia and Ethiopia against the eight core THR concepts, namely connectedness, disconnectedness, parallelism, enmeshment, belonging, reciprocity, mutuality, and synchrony.

Results: The findings identified all states of relatedness and processes/social competencies of the THR within the placement experiences of these stakeholders. The degree of positive relatedness a radiography student experiences within a practicum, irrespective of the setting, may affect their clinical performance. **Conclusion:** The findings support the argument that the THR may reflect an implicit set of criteria stakeholders use to evaluate clinical encounters. Additionally, these results are congruent with earlier investigations regarding the practicum reflections of other undergraduate healthcare students.

Implications for practice: To enhance student placement experiences, it is necessary to recognise the effect a student's sense of relatedness may have on their self-efficacy and proficiency, modifying pre-practicum preparation and assessment arrangements to inhibit disconnectedness and enmeshment, avoid the need for parallelism, and better cultivate connectedness, belonging, reciprocity, mutuality, and synchrony.

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Introduction

Growing demand for clinical radiography services and increasing staff vacancies are now matters of international concern.^{1,2,3} Whilst recruiting more pre-registration programme entrants to reduce staff shortages appears logical, suitable

environments in which students can acquire clinical experience and the availability of radiographers to teach and supervise them are inevitably limited.⁴ In recent years attention has therefore focused upon identifying those factors contributing to attrition on such programmes, as well as implementing new strategies to promote retention.^{5,6}

Practice placements are a critical component of most healthcare courses,^{7,8,9} commonly accounting for up to half of curriculum learning hours.^{10,11,12} Within radiography, workplace learning enables students to develop real-world proficiency, put theory into practice, improve clinical knowledge, refine problem-solving skills,

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and experience multidisciplinary teamworking.^{13,14,15} Nevertheless, students who consider leaving radiography programmes often identify negative practicum experiences contributing to such thoughts.^{4,16,17}

Arguably, providing effective placements not only requires appreciation of students' clinical encounters, but also a more fundamental understanding of the criteria they use when evaluating a practicum. Whilst various studies capture the placement perceptions of radiography undergraduates,^{9,10,15,17,18} little work considers the possible mechanisms by which students appraise practice learning. This study applies a theoretical framework to diagnostic radiography placement reflections in order to identify the evaluative mechanisms which may underpin these descriptions. Clearly, acquiring an understanding of the criteria stakeholders, including students, use to evaluate radiography placements may strengthen the knowledge base which can be employed to improve clinical learning experiences and thereby promote student retention.

Literature review

According to *critical realism*, whilst an objective world exists, personal interpretation of this world is shaped by social, cultural, and historical experiences.¹⁹ Within the social sciences, it is therefore deemed impossible to eliminate researcher influence from any investigative process, so all studies must be examined critically.^{20,21} A fundamental goal of critical realist research is to understand causal mechanisms leading to observed phenomena. Such mechanisms, however, cannot always be directly measured,²² hence investigators often seek to establish the most comprehensive explanation of their empirical findings; a technique known as *retroduction*.²³

The *theory of human relatedness* (THR) was developed within mental health nursing and first applied to patients experiencing affective disorders. It argues people seek to establish a sense of relatedness within their social and environmental interactions. Self-concept, and the psychological comfort or discomfort such encounters evoke, affect an individual's self-efficacy and evaluation of their interactions.²⁴ Whilst positive relatedness experiences enhance physical, psychological, social, and spiritual wellbeing, negative ones may have an adverse effect; sometimes of sufficient magnitude to cause ill-health.²⁵

The THR identifies four states of relatedness. *Connectedness* describes interactions reducing anxiety, generating a sense of comfort, and promoting wellbeing; whilst *disconnectedness* is experienced when participation is denied, causing anxiety and distress. *Parallelism* refers to situations in which non-involvement enhances wellbeing and *enmeshment* occurs when participation triggers apprehension and discomfort.²⁴ The THR also describes four processes/social competencies, which strengthen positive relatedness. *Belonging* refers to conditions leading someone to feel valued and needed by others and *reciprocity* occurs when social interactions generate feelings of complementarity. *Mutuality* is experienced when a person believes they share core values and characteristics with others and *synchrony* describes conditions in which an individual's internal psychological, social, spiritual and/or physiological rhythms align with their interactions in the external world.²⁶

Since being proposed, the THR has been applied to research topics extending well beyond its disciplinary origins.^{27,28,29,30} Two recent critical realist studies examined this theory as a potential underlying causative mechanism associated with the practicum experiences of undergraduate nursing students in the United Kingdom³¹ and Hong Kong.³² These investigations claimed the THR may reflect those criteria learners implicitly use to evaluate their encounters and that adapting placements to optimise positive relatedness might improve clinical learning and reduce student attrition. The researchers recommended future analysis of

placement reflections in other healthcare disciplines, including radiography, to identify whether the THR is applicable to the experiences of a wider student population.

Methods

This study employed a critical realist investigative approach and utilised interview and focus group data originally acquired via two earlier studies undertaken in Australia and Ethiopia. It addressed the research question:

'Can the core concepts of the THR explain the clinical practicum experiences of diagnostic radiography students?'

Both of the earlier studies, from which secondary data were obtained for the purpose of this subsequent investigation, explored the placement reflections of stakeholders involved in pre-registration diagnostic radiography programmes at two universities located in Australia and Ethiopia. In this current study, the transcriptions from these original investigations were then re-examined against the eight core THR concepts.

The Australian study from which secondary data were drawn had originally been designed to explore the clinical stressors experienced by radiography undergraduates in their final year of a programme lasting four years via use of three online focus groups involving a purposive sample of 13 participants. Within this earlier investigation, undergraduates reflected on their clinical placement experiences. A member of the research team facilitated these focus groups with support from a second research team member who was not involved in the programme.³³

Secondary data acquired from the original Ethiopian study explored the clinical placement challenges associated with radiography education in a low-resource setting using two focus groups comprised of 14 third/fourth year radiography students and interviews with 7 academic staff and 8 clinical practice educators. The investigators asked participants to reflect on their experiences of radiography placement provision. All participants were acquired via purposive sampling. Focus group discussions and interviews were conducted in Amharic (the official Ethiopian language). Transcriptions and their English translations were undertaken by the principal investigator and reviewed for accuracy by a senior independent researcher fluent in both languages. Discussions continued between both parties until a consensus was achieved.³⁴

In both of these earlier studies, ethical approval was originally sought and obtained from the relevant university committees and informed consent secured from participants. All stakeholder contributions (i.e., from the diagnostic radiography undergraduates at the Australian university and students, academic staff, and clinical practice educators at the Ethiopian university) within the two initial investigations were anonymised from the point of data transcription. Approval to extend the original investigative activities, for the purpose of this subsequent study, was secured later. Within this current secondary data analysis, all transcriptions of the placement experiences of radiography stakeholders from the earlier studies were therefore anonymous from the start of this process.

Combined data from the two original investigations were selected for analysis because, whilst both captured experience of, and reflections upon, diagnostic radiography placements, the locations in which the work was undertaken display markedly different social, cultural, economic, and linguistic characteristics. It therefore appeared that if all the THR core concepts could be identified within the placement experiences of stakeholders within such contrasting locations, then this theory may offer a more robust explanatory framework for such experiences.

Data analysis

Within the current study, the THR states of relatedness and processes/social competencies, were applied to evidence from the two earlier investigations. Qualitative content analysis of both datasets was conducted in accordance with the three-stage model described by Elo and Kyngas.³⁵ Briefly, the first stage, termed *open coding*, involved repeated reading and annotation of all transcripts to describe and summarise their content and used reviewing and highlighting tools within word-processing software for this purpose. The second stage, known as *category creation*, clustered similar or contrasting content and related annotations into higher order categories; a process in which cut and paste functions and the creation of separate documents were used to reorganise data. Finally, categorisation aligned with the eight core THR concepts was undertaken, a process referred to as *abstraction*, and yielded some sub-categories (as reflected in the results). Initial analyses were undertaken by the lead investigator [PC] who was experienced in applying this analytical tool and then shared with two other researchers [Y] and [TA], both of whom were involved in one of the two original studies from which this secondary data were derived and who were also university academics with experience in undertaking qualitative content analysis. No changes to these initial analyses were proposed.

Reflecting good practice,³⁶ the researchers, all of whom had participated in previous qualitative investigations, sought to be reflexive in their analysis by questioning taken for granted assumptions, considering both what respondents had said and not said and by examining the impact such influences may have upon the results. The principal investigator maintained a diary to capture his own views and preconceptions associated with the field of study in order to facilitate this process. He also engaged in discussion related to the work with disinterested academic colleagues to help surface any personal preconceptions.

Secondary data analysis within this investigation was undertaken by academics in three different northern and southern hemisphere universities, one of whom was not a radiographer; conditions which it was anticipated would facilitate bracketing. Although bracketing, or “an investigator’s identification of vested interests, personal experience, cultural factors, assumptions, and hunches that could influence how he or she views the study’s data”,³⁷ originates from phenomenology, researchers carrying out investigations underpinned by other philosophical perspectives now commonly employ this approach,³⁸ including those undertaking investigations from a critical realist perspective.

A detailed literature search may not only promote bracketing³⁹ but is an expected feature of a critical realist study; leading the reader through arguments based on the supporting evidence and thereby assisting evaluation of any assertions, conclusions, and recommendations made.^{40,41} As other critical realist investigators argue,^{42,43} adopting an approach which both rejects any notion of neutrality and strives for enhanced reflexivity may ultimately help demonstrate greater transparency and objectivity. A more extensive literature review therefore underpinned this study than wordage allows to be evidenced within this paper, although some of this material is identified in the results section.

Trustworthiness

As well as reflexivity and bracketing, use of appropriate data collection methods to address a research question, triangulation via scrutiny of multiple data sources, and the involvement of more than one investigator are important ways to promote the trustworthiness of a qualitative study.⁴⁴ Similarly, analysis of verbatim transcripts,⁴⁵ consideration of responses from different

stakeholder groups, termed fair dealing,⁴⁶ multiple coding, and reference to discrepant data within the results⁴⁷ help to promote validity and reliability within such investigations. This study applied all these approaches to ensure appropriate methodological application, credibility of the results, and integrity of the conclusions.

Results

To facilitate comprehension, supplementary material derived from earlier investigations is provided against each THR core concept. Illustrative responses are presented in quotation marks, significant aspects of speech dysfluency removed, and clarifying terms provided in brackets. Every respondent from the Australian study is identified by the prefix ‘A’ followed by a unique number (e.g., ‘A4’). Those in the Ethiopian study are distinguished by the letter ‘E’, followed by their abbreviated role, namely, ‘S’ (student), ‘A’ (academic staff), ‘C’ (clinical practice educator) and a unique number (e.g., ‘ES3’).

State of relatedness: Connectedness

Earlier investigations highlight active student participation as fundamental to positive practice learning,^{9,17} congruent with the concept of connectedness. Several respondents in this study recognised radiographers who facilitated involvement as contributing to their sense of connectedness:

A6: “I found my [placement] experiences to be very educational. I thoroughly enjoyed them ... I was also doing other duties like helping staff clean the rooms, pat slides, and whatnot.”

A8: “the radiographer there was quite nice. He kept like pushing. He said, just do this, this, and then I’ll come and check if you want me to expose. So that was ... a pretty good supportive environment.”

Other staff also promoted student connectedness:

A2: “Some of them [nurses] have been really lovely ... Helping you ... transfer the patient or ... you know, like cannulating.”

A11: “radiologists play a big part too because some like them to show you their pictures before you send them through. Some are very, you know, approachable.”

Moreover, peer group connectedness reduced anxiety and feelings of isolation:

A13: “it’s cool when you have like another student at some placement with you. So, you guys can share your experiences and to know that you’re not the only one.”

A2: “I was paired up with a fourth-year girl, and I was in third year, and I thought that was really good to just have someone who’s in a higher” [programme year].

State of relatedness: Disconnectedness

In previous research, descriptions of placement disconnectedness include students being socially isolated,¹⁷ ignored,⁴⁸ or excluded from service activity.⁴⁹ Respondents in this study provided similar examples:

A2 “I had a lot of trouble bonding with my supervisors in the beginning, and that made it really difficult to just like perform my

best as well because every time I would be like, 'oh like do you hate me?' Like 'why do you keep ignoring me?' Like 'why do you keep leaving me out?'"

EA3: "The technologists [radiographers] working in hospitals to whom we are sending our students are not that much willing to teach students because of lack of any incentives be monetary wise or issuance of letter of appreciations."

In some instances, however, Ethiopian respondents attributed student disconnectedness to work pressures and inadequate equipment levels:

EC3: "it is difficult to serve all patients while..[at] the same time training students because we are in [a] hurry to serve patients in order to avoid complaints."

EC2: "One machine is out of order ... Therefore, it is difficult to teach students as well as give services to patient[s]."

State of relatedness: Parallelism

Earlier research identifies radiography students employing avoidance as a stress-reduction strategy,^{50,51} thereby reflecting parallelism. Similar responses were evident in this study:

A3: "I was like, I'm not doing that. I'm just going to sit and watch."

A5: "They [supervisor] weren't good at teaching as well. So... I would just try to work with other people ... who can give me advice rather than tell me it's wrong and then not tell me how to improve it."

State of relatedness: Enmeshment

Radiography students feeling intimidated, belittled, and undermined are factors noted as impairing placement experiences^{1,16,52} and reflect enmeshment. Respondents in this investigation reported comparable negative interactions:

A13: "I've worked with some [radiographers] where they ... it seems like they're trying to intimidate you."

A4: "I feel like as fourth-year students we're kind of treated more as slaves."

Additionally, enmeshment was associated with students feeling inadequately prepared for placements:

A3: "I felt like so incompetent, and it was just so hard."

ES11: "both the subject matter and the practice are carried out during 4th year that means we go for practice before we finish the class. Because of that, we face difficulty to practice as we still did not finish its theoretical part."

Often, student anxiety and discomfort related to working with specific service user groups, such as babies, bariatric patients, individuals reporting severe pain, or within specific clinical environments, most notably theatres.

Frequently, enmeshment was also the product of tensions between clinical efficiency, procedural compliance, and operational safety:

A4: "your supervisors are like; can you speed this up a little bit? I'm like, 'I'm trying my best'. So ... it's one of those situations. It's just frustrating and tiring."

ES6: "in one of the hospital[s] special procedures like CUG [cystourethrogram] is done by radiologists and they order us to give contrast injection while procedure is still going on and this will expose us to radiation."

Nonetheless, some Australian university students positively reframed earlier enmeshment experiences:

A6: "it's an immensely character-building experience to be thrown into the deep end, see your reaction, and then you're allowed to grow."

A11: "I think that challenging experiences like grow me as a person. I find that I improve after facing challenges."

Process/social competency: Belonging

Previous investigations emphasise the importance of students being welcomed, included, and valued as team members,^{17,49} thereby facilitating belonging. Respondents in this study expressed comparable views:

A6: "As much as we are there to assist them and to be part of the team, ultimately, we are there to learn, and they are meant to be our teachers, our guides pretty much to these raging waters. As a result, there is a sort of unspoken expectation that staff will stand up for the students."

A8: "They're [radiologists] like, 'oh I've heard from other radiographers that you're doing a good job, and I've seen your pictures. Keep it up'. And like that's quite supportive."

Some learners, however, described practicum experiences which impaired belonging:

A2: "there's going to be people who you get along with and people who you don't ... and yeah basically, you just have to find your own way."

A3: [Placement staff have] "just got to treat students as if they're a part of the team and not as students."

Process/social competency: Reciprocity

Research involving newly qualified radiographers identifies the importance of being supported and taught by experienced clinicians⁵³; responses which illustrate reciprocity. Numerous examples of similar interactions were described by these respondents:

A10: "when you have like patient staff and staff that want to teach you, it makes it less emotionally stressful"

EC4: "I am very happy that I am engaged in training students because I myself learn from them."

Students described adverse consequences in situations where reciprocity was absent:

A4: "as a student you can't really express your ... how you feel or what you want to say because you are a student."

A2: “with the supervisors, like when you don't get along ... I don't know, you ... I just felt really down, and I just went home every day [during placement] just like going [thinking], ‘oh, is this really what I want to do with my life?’”

Process/social competency: Mutuality

Arguably, mutuality is best demonstrated in working relationships where a practitioner is perceived as a role model whom a learner wishes to emulate.³² Research identifies some radiographers as influential role models who affect student career intentions.⁵⁴ Similar mutuality was occasionally described by these respondents:

A5: ‘Mentoring with someone close to your age or someone that cares provides me with a personal connection ... They will probably try to answer you because they're trying their best as well as a student or as a mentor. You feel that personal connection.’

More commonly, however, comments suggested a lack of mutuality:

A7: “a lot of patients that come in with like history of mental illness and stuff, I feel a bit stressed ... like how my supervisors and stuff will react to it because I know that a lot of them think badly and talk badly about it.”

A6: “there was no teamwork between the different modalities for respectively [they were] arguing against one another. There was racism. There was discrimination. They broke a lot of best practice rules.”

Process/social competency: Synchrony

The THR concept of synchrony is underpinned by Social Zeitgeber Theory (SZT).²⁴ According to SZT, consistent work, domestic, and leisure routines stabilise an individual's social rhythms. It is argued that social rhythms reinforce circadian rhythms and events which disrupt them can adversely affect health and wellbeing.^{55,56} Radiography students may experience significant changes to environmental and social routines during their programme; potentially triggering social dysrhythmia and impairing synchrony. Earlier investigations highlight the problems learners encounter accommodating practicum requirements, including work rotas, additional travel, and financial pressures.^{6,9,57} Respondents in this study also mentioned the social, psychological, and physical effects of their placements causing asynchrony:

A8: “You can talk to your friends, but like they've also got placement as well, so they sometimes don't have time.”

ES6: “There is also [a] transportation service problem. We do not have our own services; therefore, we cannot reach to the practice place on time.”

AS4: “the biggest struggle for me, was having to work on the weekends as well just to make money to get petrol to go back and forth to placement.”

A5: “if you're an international student [on a rural placement], you're paying two accommodation prices.”

Discussion

Findings from this investigation provide further evidence to support the results of previous similar critical realist studies

involving other healthcare students, which have argued that the eight core THR concepts may reflect the implicit criteria learners employ to evaluate placements.^{31,32} Moreover, it appears the relatedness students feel within a practicum can ultimately affect their clinical performance.

Critical realist researchers are expected to recommend beneficial changes based upon their findings,⁴³ hence this expectation is now honoured. Broadly speaking, enhancing practicum experiences may necessitate creating conditions which inhibit disconnectedness and enmeshment, avoid the need for parallelism, and better cultivate connectedness, belonging, reciprocity, mutuality, and synchrony. More comprehensive pre-placement preparation for radiography students and placement staff, akin to those interventions recommended in earlier studies,^{12,16,19} as well as more accessible pastoral and peer support,⁴⁶ may help to achieve these goals. Modifying practicum audit tools to also assess relatedness appears similarly desirable,³² as do initiatives, such as more parent/carer-friendly placement schedules or the option of part-time programme attendance, to promote student synchrony.

Simulation-based learning, which can be comparable to real workplace experience in achieving some learning outcomes for radiography students,⁸ might advantage learners during subsequent clinical placements, enhancing their initial self-efficacy and mitigating negative relatedness. Additionally, the student's sense of connectedness, belonging, reciprocity and mutuality within this learning environment should arguably be appraised before their clinical proficiency is formally assessed. Furthermore, evaluation of the learner's emotional state prior to their engagement in new tasks or other duties in which they display less confidence, perhaps involving pre-activity briefings and post-activity debriefings, may strengthen self-efficacy and positive relatedness.

Limitations of the study

The analysed data were originally obtained to explore clinical stressors for final-year undergraduates on an Australian diagnostic radiography degree programme and the placement challenges identified by stakeholders involved in similar learning provision in Ethiopia, not to examine placement reflections through a THR lens. In this investigation, primary research to elicit evidence of this theory from practicum experiences might have generated more comprehensive and demonstrably impartial evidence. Nevertheless, secondary data analysis eliminated the possibility of bias regarding formulation of questions evoking the interview and focus group responses subsequently used to ascertain the presence or absence of the THR core concepts within this, originally unanticipated, study. Furthermore, the results of this latest research are comparable with those of two earlier investigations,^{31,32} thereby supporting the argument that the THR may reflect an implicit mechanism used to evaluate practice learning.

Conclusion

The THR maintains that relatedness within a social environment affects an individual's behaviour and wellbeing. Examining clinical practicum experiences of students and other stakeholders involved in diagnostic radiography programmes against the eight core THR concepts may identify those criteria individuals implicitly use to evaluate practicum experiences and, congruent with this theory, clarify actions to best develop the knowledge, skills and professional values expected of a radiographer. Given the increasing international demand for practitioners in this discipline and concern regarding vacant posts,^{1,2,3} strategies to promote positive relatedness during placements may ultimately help address staffing

problems through increased recruitment and retention (i.e., reduced attrition) to radiography programmes.

Analysis of student practicum experiences in other disciplinary fields, both within and beyond healthcare, would permit investigation of the THR as a means to explain the criteria used by a more diverse student population to evaluate their workplace learning. It may also assist in the identification of techniques to enhance such experiences. The authors hope this paper will encourage further investigation of an under-researched topic.

Ethics approval

Approval was sought and obtained from the relevant institutional committees.

Conflict of interest statement

None.

Acknowledgements

Thanks to Scott Preston at North Cumbria Integrated Care NHS Foundation Trust and The Open University for his assistance in shaping the initial study design.

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