

Raised Anxiety Levels Among Outpatients Preparing to Undergo a Medical Imaging Procedure: Prevalence and Correlates

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Abstract

Purpose: To examine the percentage of patients with raised state anxiety levels before undergoing a medical imaging procedure; their attribution of procedural-related anxiety or worry; and sociodemographic, health, and procedural characteristics associated with raised state anxiety levels.

Materials and Methods: This prospective cross-sectional study was undertaken in the outpatient medical imaging department at a major public hospital in Australia, with institutional board approval. Adult outpatients undergoing a medical imaging procedure (CT, x-ray, MRI, ultrasound, angiography, or fluoroscopy) completed a preprocedural survey. Anxiety was measured by the short-form state scale of the six-item State-Trait Anxiety Inventory (STAI: Y-6). The number and percentage of participants who reported raised anxiety levels (defined as a STAI: Y-6 score ≥ 33.16) and their attribution of procedural-related anxiety or worry were calculated. Characteristics associated with raised anxiety were examined using multiple logistic regression analysis.

Results: Of the 548 (86%) patients who consented to participate, 488 (77%) completed all STAI: Y-6 items. Half of the participants ($n = 240$; 49%) experienced raised anxiety, and of these, 48% ($n = 114$) reported feeling most anxious or worried about the possible results. Female gender, imaging modality, medical condition, first time having the procedure, and lower patient-perceived health status were statistically significantly associated with raised anxiety levels.

Conclusion: Raised anxiety is common before medical imaging procedures and is mostly attributed to the possible results. Providing increased psychological preparation, particularly to patients with circulatory conditions or neoplasms or those that do not know their medical condition, may help reduce preprocedural anxiety among these subgroups.

Key Words: Anxiety, outpatients, MRI, tomography, x-ray computed, surveys and questionnaires

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INTRODUCTION

More than three billion medical procedures involving ionizing radiation are performed worldwide each year [1], and over 15 million medical imaging procedures are performed in Australia [2]. Patients experience imaging

procedures in diverse ways [3], and for some there is a level of burden including anxiety, fear, and claustrophobia associated with some imaging modalities [3]. Patient distress may have negative implications for the health care system via imaging appointment

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cancellations or no-shows, increased use of sedatives, longer procedural times, or the need for repeated procedures [4,5]. In one study, 72% of radiographers reported that anxiety was an issue for patients before undergoing MRI, and 19.3% reported that anxiety disrupted scanning on a regular basis [6]. Although conflicting findings have been reported, image quality may be inversely proportional to patient anxiety [7].

Some studies have examined medical imaging-related anxiety. However, most of this research has focused on MRI [1,6,8-10], PET/CT [11,12], interventional radiology [5,13], or procedures relating to breast cancer diagnosis [14-16], which limits the generalizability of findings. Some studies report estimates of anxiety using poorly defined and inconsistent State-Trait Anxiety Inventory (STAI) score cut points, making it difficult to compare and contrast findings between studies [5,7], and other studies report mean anxiety scores only [4,12,15,17]. Additionally, some studies have not accounted for participants' prior experience of the procedure [7,9] or attempted to ascertain what patients are most anxious about in relation to the procedure (eg, fear of the procedure versus the findings). Collectively, these issues limit our understanding of the prevalence of raised anxiety in medical imaging populations.

Evidence-based methods of reducing anxiety exist, including the provision of preparatory information and psychological approaches [5,11,18]. However, it is not clear which patients are at higher risk of experiencing preprocedural anxiety and should be targeted for such interventions by health care providers. Determining the extent to which raised anxiety is experienced by patients presenting for a range of imaging modalities and medical conditions and the subgroup of patients most at risk of raised anxiety could assist in the planning and delivery of health care.

To address these gaps in knowledge, we undertook this study to examine the percentage of patients with raised state anxiety levels before undergoing a medical imaging procedure (CT, x-ray, MRI, ultrasound, angiography, or fluoroscopy), their attribution of procedural-related anxiety or worry, and the sociodemographic, health, and procedural characteristics associated with raised state anxiety levels.

MATERIALS AND METHODS

Study Description

This article presents the anxiety-related findings from a larger study that assessed patients' perceived preparation

for medical interventions. A cross-sectional study was undertaken in the outpatient medical imaging department at a major public hospital in regional Australia. Patients aged ≥ 18 years and undergoing an elective medical imaging procedure, including CT, x-ray, MRI, ultrasound, angiography, or fluoroscopy, were eligible to participate. Patients unable to provide informed consent independently, with insufficient English proficiency, or considered physically or mentally incapable of participating by clinic staff were excluded. The study received institutional review board approval.

Recruitment and data collection took place from May to December 2015. Clinic staff assessed patient eligibility at appointment check-in. Eligible patients' interest in discussing the study with a researcher while they waited for their appointment was sought. The researcher provided interested patients with a written study information statement and sought their informed consent to participate. The gender of nonconsenting patients was recorded to examine consent bias. Participants were asked to complete a brief self-report questionnaire before their imaging procedure via a touch screen computer tablet or a pen-and-paper version if preferred. All participants were recruited and completed the questionnaire in a common waiting area.

Outcome Measure

Anxiety was measured by the six-item short-form of the state scale of the STAI (STAI: Y-6) [19]. This instrument provides an estimate of how an individual is currently feeling (ie, state anxiety), rather than trait anxiety (which indicates proneness to anxiety, or how one generally feels) [20]. State anxiety was deemed most relevant to this study because we were interested in patients' feelings of anxiety in relation to the potentially stressful experience of medical imaging, and previous research indicates that levels of state anxiety can be reduced by simple interventions. The instrument includes three anxiety-present items ("I am tense"; "I feel upset"; "I am worried") and three anxiety-absent items ("I feel calm"; "I am relaxed"; "I feel content"). For each item, respondents indicate how they feel "right now, at this moment" using a 4-item response scale ranging from 1 ("Not at all") to 4 ("Very much so"). In accordance with the scoring instructions [19], the anxiety-absent items were reverse scored and the responses to all items summed to produce a raw score. This score was multiplied by 3.333 (ie, 20 [number of items in the full STAI scale] divided by 6 [number of items in the STAI: Y-6]) to produce a final score ranging from 20 to 80,

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