

Evaluating Thyroid Shield Usage and Awareness of Radiation Risks Among Orthopaedic Surgeons and Theatre Staff

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BACKGROUND

Orthopaedic surgeons are exposed to significant occupational radiation due to frequent use of intra-operative fluoroscopy, which increases the risk of malignancy, cataracts, and thyroid disorders. Thyroid cancer incidence has been reported to be up to 1:200 in an Australian Orthopaedic surgeons cohorts compared with 1–3 per 100,000 in the general population(1). A thyroid shield properly worn can reduce the radiation exposure to the thyroid by a factor of 13 (2).

Previous reviews have shown that trainees and theatre staff often lack formal radiation safety training. This could be a contributing factor to poor compliance with the use of thyroid shield, despite the established link between ionising radiation and incidence of thyroid carcinoma (3).

This study aimed to assess local awareness of radiation-associated thyroid cancer risk, evaluate thyroid shield usage, and identify barriers to consistent use to inform safety improvement measures.

METHODS

A cross-sectional survey was conducted among orthopaedic consultants, trainees, scrub nurses, and theatre assistants. The questionnaire explored knowledge of thyroid cancer risk, ability to locate thyroid shields, frequency of use, and behaviour when shields were unavailable.

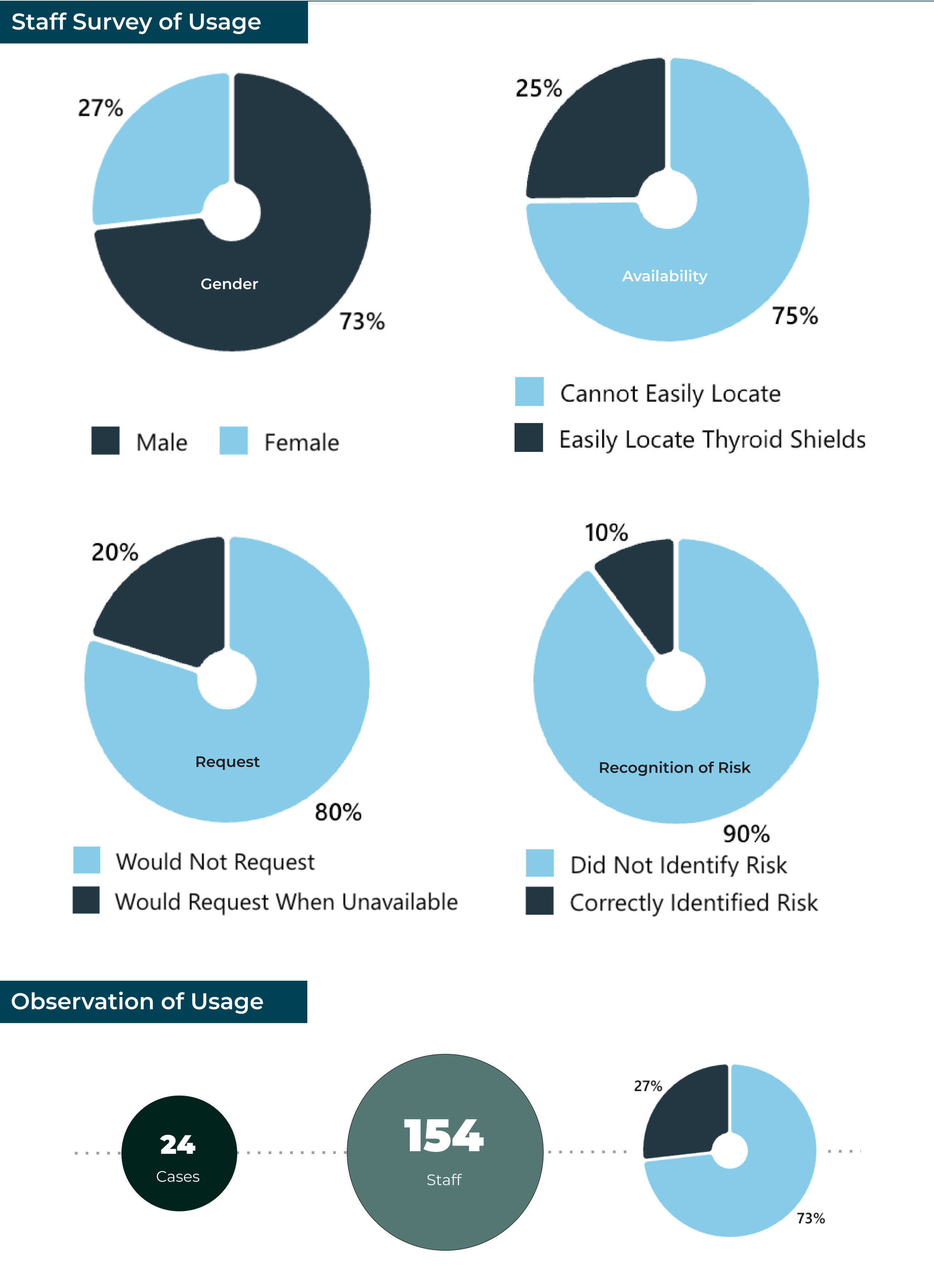
In parallel, prospective observational data were collected on shield usage during procedures involving image intensifier screening. Descriptive statistics were used to report proportions.

REFERENCES

1. Dewey P. Preliminary report on thyroid cancer survey. *Australian Orthopaedic Association Bulletin* 1997; 18-2, 38.
2. Dewey P, Incoll I. Evaluation of thyroid shields for reduction of radiation exposure to orthopaedic surgeons. *Aust N Z J Surg.* 1998;68:635-6.
3. Greenspan FS. Radiation exposure and thyroid cancer. *JAMA.* 1977;237(19):2089-91.

RESULTS

Thirty staff members participated in the survey (22 male [73%], 8 female [27%]). Only 25% (n=7) reported being able to easily locate thyroid shields, and just 20% (n=6) would request them when unavailable. Awareness of the elevated risk was low, with only 10% (n=3) correctly identifying the increased thyroid cancer risk associated with repeated exposure. Observational data of 24 cases with a total of 154 staff, confirmed that 26% of theatre staff including surgeons wore thyroid shields during cases that required fluoroscopy.



CONCLUSION

Our findings mirror published evidence that radiation protection compliance remains sub-optimal among orthopaedic personnel. Despite robust data demonstrating that thyroid shields can reduce radiation dose to the neck by a factor of 70, they are underutilised. The combination of poor awareness, equipment availability, and behavioural factors highlights the need for structured education programmes, consistent shield placement in theatres, and institutional reinforcement of radiation protection policies.