Using action research to develop a real-time measure of job satisfaction in the operating room setting

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Abstract This paper outlines how action research was used to develop a real-time job satisfaction measurement tool for the operating room (OR) setting. It offers insight into how collaborative action research can be used in a complex interprofessional setting to create a practical, valid and relevant tool. The study was conducted within one New Zealand hospital OR department during the period of March 2018 – June 2019. Using action research cycles, researchers and hospital personnel collaboratively created an innovative one-minute daily job satisfaction measure called the Morale-o-Meter. Complexities relating to its development and acceptability are explored and reflected upon, in order to draw insight for other researchers who are looking to use this methodology in a similar setting.

Keywords: Action research; instrument development; job satisfaction; operating theatre; collaborative research

Usando la investigación-acción para desarrollar una medida en tiempo real de la satisfacción laboral en el ambiente de la sala de operaciones

Resumen Este artículo describe cómo se utilizó la investigación-acción para desarrollar una herramienta de medición de la satisfacción laboral en tiempo real para el ambiente de la sala de operaciones. Ofrece información sobre cómo se puede utilizar la investigación-acción colaborativa en un ambiente interprofesional complejo para crear una herramienta práctica, válida y relevante. El estudio se realizó en el departamento de la sala de operaciones de un hospital de Nueva Zelanda durante el período de marzo de 2018 a junio de 2019. Utilizando ciclos de investigación-acción, los investigadores y el personal del hospital crearon en colaboración una medida innovadora de satisfacción en el día a día laboral, llamada Medidor de Moral. Las complejidades relacionadas con su desarrollo y aceptabilidad son exploradas y reflejadas con el fin de obtener información para otros investigadores que buscan utilizar esta metodología en un ambiente similar.

Palabras clave: Investigación-acción; desarrollo de instrumentos; satisfacción laboral; quirófano; investigación colaborativa

Introduction

The hospital setting is a complex organisational system, influenced by multiple stakeholders, numerous job roles and the large populations that it serves (Braithwaite, Clay-Williams,

Nugus, 2013; Montgomery, Doulougeri, & Panagopoulou, 2015). The operating room (OR) team is commonly made up of a combination of surgeons, anaesthetists, nurses and technicians (Gillespie, Chaboyer, Longbottom, & Wallis, 2010). Team members work closely, in intense conditions, often for long periods of time. Under tight schedules, each role is heavily dependent on the other roles, to achieve the overall outcome (Gillespie et al., 2010). The foundations of the organisational system are embedded within strong hierarchical structures, robust policies and strict procedural guidelines designed to reduce the risk for errors and meet performance targets (Arakelian, Gunningberg, & Larsson, 2008; Tsai, Sanford, Black, Boggs, & Urman, 2017). While the organisational structure of the OR may appear linear on paper, closer analyses reveal that the actual environment is somewhat non-linear and often unpredictable; its multiple stakeholders, complex communication pathways, and dynamic team and social relationships are key contributors to this unpredictability (Braithwaite, Clay-Williams, & Nugus, 2013; Tsai et al., 2017). Consequently, any research methodology underpinning an intervention in the OR needs to be clearly assessed for its utility in this complex system.

The flexible and participatory nature of action research provides a sound platform for the complexity of the hospital setting, as it allows researchers to work with and become a part of the dynamic system (Montgomery et al., 2015; Phelps & Hase, 2002). Action research is an increasingly popular alternative to traditional research inquiry methods across the healthcare sector (Costello, 2003; Kjellström & Mitchell, 2019). Specifically, action research can be defined as "an orientation to knowledge creation that arises in a context of practice and requires researchers to work *with* practitioners" (Huang, 2010, p. 93). Consequently, it embraces a pragmatic and collaborative approach to problem solving, aiming to increase understanding and generate and evaluate change in a 'real world' setting (Costello, 2003; Williamson, Bellman, & Webster, 2012). The core principles of action research are centred around a respect for diversity, drawing on the strengths of communities, and reflecting on cultural identities, with a focus on power-sharing and co-learning (Minkler, 2000). Promoting these values, however, is not always easy, and can be particularly challenging in institutions (such as the OR department in a hospital) that are highly complex and heavily hierarchical (Brydon-Miller, Greenwood, & Maguire, 2003).

Action research is primarily focused on generating knowledge and empowering stakeholders (Huang, 2010). This involves researchers working together with healthcare practitioners as partners in the design and/or application of the research (Huang, 2010; Williamson et al., 2012). This act alone can begin a process of transformation within the workplace environment (Huang, 2010). The practical focus of action research, and the need to design studies that are effective in a particular environment, often calls for a "what works" approach (Ivankova & Wingo, 2018). This involves utilising action research cycles most commonly consisting of one or many repetitions of *problem identification, planning, implementing* and *reflecting* to reach the desired outcomes (Montgomery et al., 2015).

Employers of staff working in OR are becoming increasingly aware of the associations of job satisfaction with burnout, organisational commitment, staff turnover, absenteeism, and intention to leave (Coomber & Louise Barriball, 2007; Lee, MacPhee, & Dahinten, 2020; Lu, While, & Louise Barriball, 2005; Meyer, Stanley, Herscovitch, & Topolnytsky, 2002; Rama-Maceiras, Parente, & Kranke, 2012; Shanafelt et al., 2009; Tsigilis, Koustelios, & Togia, 2004; Yin & Yang, 2002). Innovative research that aims to enhance the way that job satisfaction is measured and managed in the OR setting is therefore of high importance.

Job satisfaction is one of the most well researched concepts in organisational psychology (Judge, Weiss, Kammeyer-Mueller, & Hulin, 2017). While there are many definitions, it is most commonly defined as the extent to which an employee likes or dislikes their job (Spector, 1997). It is widely accepted that job satisfaction is influenced by both intrinsic (internal) and extrinsic (external) factors and includes both cognitive (someone's thoughts or beliefs about aspects of their job) and affective (how they feel about their job) components (Dalal & Credé, 2013; Judge et al., 2017; Kaplan, Warren, Barsky, & Thoresen, 2009). In this study, researchers collaborated with senior managers working within ORs to create a relevant, valid, and practical real-time tool for measuring job satisfaction in the OR setting. This paper describes and reflects on how action research was used to develop a daily job satisfaction tool within a New Zealand OR setting to meet a specific need identified by the hospital.

1. Method

A mixed method action research design was adopted, guided by traditional tool development theory (Kyriazos & Stalikas, 2018). The study was conducted over a 15-month period from March 2018 to June 2019 within the operating department of one New Zealand hospital. It comprised four overarching action research cycles, each embedded with numerous sub-cycles. These included: 1) Problem identification (defining the construct); 2) Planning (choosing and creating the measure); 3) Implementation (field testing – pre-test and trial); and 4) Reflection / evaluation (validation / improvements). The study included over 35 meetings between researchers and hospital personnel. An outline of the stages and methods utilised can be seen in Table 1. Data collection was via meeting minutes, journal entries, trialling the Morale-o-Meter tool, and a feedback and validation survey. Qualitative and quantitative data were combined to draw the overall conclusions (Ivankova & Wingo, 2018). Data analyses were done through thematic analysis, descriptive statistics and pairwise correlations utilising SPSS and R statistical software, while multi-level modelling was conducted with M*plus* 7.0 (Muthén & Muthén, 2015).

Table 1. Summary of methods for action research and tool development stages with rationale

Stage	**Action research** (Montgomery et al., 2015)	**Tool development** (Kyriazos & Stalikas, 2018)	**Methods**	**Rationale** (Kyriazos & Stalikas, 2018; Montgomery et al., 2015)
1	Problem identification	• Define purpose • Define construct • Set theoretical foundations	• Consult the literature • Consult experts • Meetings with key stakeholders • Utilise continuous action research cycles until an agree-	Collaborating to define and clarify the purpose of the tool and the construct to be measured is a crucial first step in the tool development process. It provides a

Stage	Action research (Montgomery et al., 2015)	Tool development (Kyriazos & Stalikas, 2018)	Methods	Rationale (Kyriazos & Stalikas, 2018; Montgomery et al., 2015)
			ment has been reached.	sound theoretical foundation and builds trust.
2	Planning	• Choose measurement • Choose wording, format, and platform • Plan what testing and feedback are required • Plan management of results	• Collaboratively identify priorities • Gain input from a range of relevant workplace personnel, e.g., managers, cultural advisors, experts in the field. • Utilise continuous action research cycles until agreement is reached between researcher and practitioners	Combining the views and priorities from a range of workplace and academic sources will ensure the tool is both appropriate for the context and valid in relation to the construct that is being measured. This stage is highly important for the sustainability of any intervention.
3	Implementation	• Pre-test • Field test	• Run a pre-test within two operating theatres • Utilise action research cycles until a final version is agreed upon • Conduct a three-week trial with a larger cohort of staff	Field testing is an essential component of tool development in order to test the comprehensibility, relevance, acceptability, and feasibility of implementation with a sample of the population that the tool is designed for
4	Reflection	• Analyse validity • Evaluate usability • Identify improvements needed	• Gain feedback from staff via survey following the trial • Analyse validity from validity survey following the trial • Gain feedback from managers • Discuss and reflect on outcomes to further improve the tool.	Reflection and evaluation ensure the appropriate time and consideration are given to improvements and modifications that are necessary prior to the start of the next iterative cycle

2. The results of the action research stages

2.1 Problem identification / defining the construct

Defining and clarifying the construct to be measured is a crucial first step in the tool development process, and involves first identifying the problem and clarifying the purpose of a measurement tool. It ultimately connects ideas to theory (Kyriazos & Stalikas, 2018). A series of initial meetings between the senior management who work within the OR department and researchers identified that the department did not have a formal mechanism for frequent monitoring of staff 'morale' in real-time. The managers reported that staff had 'survey fatigue' and were resistant to filling in long surveys. They were aware that evaluating the success of any interventions seeking to improve staff wellbeing would be impossible without an ability to establish a baseline and monitor for improvement or decline in close to real-time. Ideally, they wanted to be able to report to their managers about staff 'morale' along with other key performance indicators.

From an academic perspective, researchers needed to clearly conceptualise the meaning of 'morale' in theoretical terms in order to consider the validity of its measurement. For example, was improving 'morale' for them actually about enhancing staff engagement or increasing organisational commitment? The term 'morale' is generally not a well-defined or precisely measured concept in healthcare (Sabitova, Hickling, & Priebe, 2020). In this setting, the concept of 'morale' was a common layman's term used informally to discuss how 'employees' were feeling about their jobs. After in-depth discussions about the purpose of the tool, exploration of the relevant literature and consultation with an organisational psychologist (of 10 years' experience), it was agreed that 'job satisfaction' was in fact the appropriate theoretical and operational construct to be measured. Managers wanted to know how staff were feeling about their job from a range of perspectives, such as experience of work conditions, the impact of communication between staff or their fulfilment from the clinical work itself. A global measure of job satisfaction (i. e. one that asks employees how they are feeling about their jobs in general) was deemed appropriate to capture this broad perspective of job satisfaction. Global measures allow employees to compare and contrast qualities from their present and past cognitive and affective experiences in their jobs, as opposed to facet-based measures which may not capture the affective variability and mood elements as effectively as a global question might (Highhouse & Becker, 1993; Judge et al., 2017). Job satisfaction's strong relationship with many other job attitudes and outcomes makes it a valuable construct. For example, job satisfaction is a known antecedent for work engagement and closely related to intention to leave one's job, particularly for nurses (Abraham, 2012; Coomber & Louise Barriball, 2007; Yin & Yang, 2002).

In order to provide a sound foundation for the steps to follow, a clear and concise definition and model of the construct was then chosen (Kyriazos & Stalikas, 2018).

2.2 Planning / choosing and creating the measure

The planning stage began with research into existing studies and tools (Kyriazos & Stalikas, 2018). A literature review was conducted of studies relating to job satisfaction in the OR; this included a summary of existing measures used in each study as a starting point. The findings

identified 27 different pre-existing surveys and 15 study-specific surveys used in the OR setting (James-Scotter, Walker, & Jacobs, 2019). There was no tool identified through this process that was deemed appropriate for the purpose of a daily measure due to length, validity, or context. A range of further approaches to measuring job satisfaction from an academic, clinical and business sector perspective was discussed in further meetings between researchers and senior management. At each meeting, the researchers presented possible ideas or modifications to existing measures, which were then discussed further. From this process, a number of agreed priorities that were considered important, for either the clinical relevance and/or the academic rigour of the tool emerged (see Table 2).

Table 2. Priorities agreed on by researchers and practitioners

- Employees were anonymous when responding to the survey
- The tool was easy and fast to use
- The tool was easily accessible
- Matching survey responses from the same participant
- Data gathered by the tool were reliable and valid
- The tool provided information on factors influencing staff satisfaction responses
- The tool provided information on individual specialties and job roles
- The tool was appropriate and acceptable for Māori employees
- The tool was appropriate and acceptable for a diverse range of cultures and a range of literacy levels (including computer literacy).

In order to meet the identified priorities, it was agreed to develop a digital tool based on a pre-validated single item measure of global job satisfaction. This strategy is recommended by Kyriazos and Stalikas (2018) who encourage researchers to adapt existing instruments, the psychometric testing of which has been previously examined, to fit the purpose of the specific research setting. Further meetings were held, focusing on the wording, response scale, format, and platform. It was agreed to use iPads for administering the survey. In order to gain 'buy in' from staff, the traditional Likert response scale (e. g., strongly agree to strongly disagree) was adapted to include more casual language (e. g., great, I love my job today to awful, get me out of here!), whilst maintaining an anchored 1–5-point Likert scale (Kyriazos & Stalikas, 2018). To provide meaningful information for managers, it was agreed to ask employees to identify the factors influencing their job satisfaction response that day. The options for this were derived from the existing literature (James-Scotter et al., 2019). The survey asked participants to create a username which they would input before every use (they were provided with a guide to ensure anonymity and to prevent people from forgetting their usernames (Yurek, Vasey, & Sullivan Havens, 2008). The Morale-o-Meter took approximately one minute to complete. A number of action research cycles were required, in order to agree on a final product ready for wider consultation.

Once an initial concept had been agreed upon, the researchers took the idea to a range of other senior and middle managers within the wider OR team to get their feedback and input. This included at least one manager from each job role (anaesthetists, anaesthetic technicians, nurses/healthcare assistants, orderlies, and surgeons). A Māori advisor from the hospital (appropriate for the New Zealand setting) was also consulted. Feedback from this process was gathered and discussed at further meetings.

Not surprisingly, each manager had his/her own unique perspective and needs, relating to how his/her staff would/should utilise the tool. For example, orderly managers were concerned that computer literacy could be a barrier for some of their team and therefore it is important to providing them training to use the tool. They also needed access to the tool in locations other than within the theatres, such as the tea room. Anaesthetist managers felt that using the tool for 2–3 shifts per week would be more than enough. Anaesthetists needed to be able to use the tool at any time during the day to suit their workloads and a phone option was important for them as they did not use the theatre bench as frequently as other team members. Some nurse managers were concerned that charge nurses had been grouped together under 'nurses' on the tool and that their specific job role needs would go unseen. Nurse and anaesthetic technician managers felt they needed more detailed and frequent data, ideally receiving immediate alerts if there was a significant decline. Nurse managers wanted staff to be able to complete the tool multiple times a shift if needed due to the variability of a work day. Overall, there was a common concern among managers about the potential for poor tool results to impact or reflect negatively on them. They were concerned about the level of support they would receive and the transparency of the results. It became clear that transparency around the data that was gathered, and how they were going to be used were very important. The findings from this process resulted in a number of changes, such as an agreement and plan for the sharing of findings following the initial trial and the addition of a 'senior nurse' job role option to the tool. Consultation with the Māori advisor and the relevant literature also resulted in changes to the tool that would allow for the influence of 'cultural wellbeing' at work to be incorporated into the tool (Haar & Brougham, 2013) (the Morale-o-Meter tool is outlined in Figure 1)

Figure 1. The morale-o-meter tool (final version used for the trial)

Morale-o-Meter
Username (*the day of the month of your birthday' combined with 'the first 3 letters of your mother's name (e.g. 03Jen)'*
Time of shift (*beginning, middle, end*)
Job site *(not identified to preserve the anonymity)*
Overall, how are you feeling about your job today? *(1) Great, I love my job today!', (2) 'Pretty good really', (3) 'Neutral ho hum', (4)'Not great actually'* and *(5)'Awful, get me out of here!'*
What does this mostly relate to? *1) the nature of the clinical work, 2) communication and relationships with colleagues, 3) organisational factors (e.g., staffing, workload, resources), 4) patient interactions, 5) ethnic cultural wellbeing, 6) other (with an open text option) and 7) I'd rather not say.* (Multiple choices were allowed).
Job role *(Anaesthetist, Anaesthetist registrar / fellow, Anaesthetic technician, Anaesthetic technician trainee, Healthcare assistant, Nurse, Orderly, Senior nurse, Surgeon, Surgical registrar / fellow, other, I'd rather not say)*
Speciality *(General surgery, Gynaecology, Obstetrics, ORL, Orthopaedics, Urology, Other, I'd rather not say)*

A key contribution of researchers during this stage was to provide help relating to the technical and ethical aspects of the tool development process, such as validity and anonymity. It was agreed to do a small amount of initial testing of the predictive validity of the tool relating to burnout and organisational commitment, and to test construct validity to ensure that the

adapted version of the single item measure used at a daily level was still measuring the intended construct (i.e., job satisfaction). This would involve administering a survey at the end of the trial. The survey was developed by researchers in consultation with an organisational psychologist, and was intentionally limited to ten questions, given that this cohort were resistant to surveys. The validity questions were combined with the feedback survey administered to staff after the implementation phase. In the validity and feedback survey, we measured overall job satisfaction, affective commitment, and emotional exhaustion. Specifically, *overall job satisfaction* was measured using a well-known single-item global job satisfaction question originating from Scarpello and Campbell (1983); *affective commitment* (a key component of organisational commitment) was measured using a single item selected from the subscale of the organisational commitment scale (Allen & Meyer, 1990), and *emotional exhaustion* (a key component of burnout) was measured using three items derived from the Maslach Burnout Inventory (Spurgoen, 1998). Internal consistency reliability of emotional exhaustion was 0.80 (see Figure 2 for an outline of the Feedback and Validity survey).

Figure 2. Outline of the Feedback and Validity survey

Morale-o-Meter username (the day of the month of your birthday' combined with 'the first 3 letters of your mother's name (e.g. 03Jen)'
Gender, Age, Ethnicity (drop down options provided)
Feedback questions
What do you think about having a tool like this in place permanently?
(1) Extremely good idea, (2) Good idea (3) Not sure (4) Bad idea (5) Extremely bad idea.
What device did you prefer to use during the trial?
1) iPad in theatre 2) iPad in tearoom 3) iPad in anaesthetic tearoom 4) cell phone
What were the barriers to using the tool every shift?
1)I would forget 2) I was too tired 3) iPads not accessible or working properly 4) didn't feel comfortable answering the question 5) there were no barriers for me 6) other
Feedback, comments or suggestions – open text box
Validity questions
All things considered, how satisfied are you in your job?
(1) Extremely satisfied (2) satisfied (3) Neither satisfied or dissatisfied (4) dissatisfied (5) Extremely dissatisfied
"I would be happy to spend the rest of my career with this organisation"
(1) strongly agree – (5) strongly disagree
"I feel used up at the end of the workday",
(1) strongly agree – (5) strongly disagree
"I feel emotionally drained from my work"
(1) strongly agree – (5) strongly disagree
"I feel burned out from my work."
(1) strongly agree – (5) strongly disagree

2.3 Implementation / field tests

Field testing is an essential component of tool development. It can be repeated as many times as required to test the comprehensibility, relevance, acceptability, and feasibility of im-

plementation with a sample of the population that the tool is designed for (Kyriazos & Stalikas, 2018). Following the planning stage, the Morale-o-Meter underwent a pre-test phase conducted within two theatres over one day. Participants were invited to test the tool. The first author was present to observe their entries and gather written or verbal feedback relating to their experience using the tool. Sixteen entries were received. The results were then shared at meetings for discussion and reflection. This led to further modifications (see Box 1 for the final version of the Morale-o-Meter following this phase). A three-week trial of the Morale-o-Meter tool was then conducted from the 27th of May 2019 to the 14th of June 2019 with the whole OR department.

For the three-week trial, 17 iPads were placed in desk stands across 14 operating theatres, two tearooms and an anaesthetic technician room. A cell phone option was also available. Each iPad stand displayed instructions asking staff to use the tool once each shift. Recruitment was done via a bulk email invitation to all staff and through posters; the first author also presented at a range of staff meetings to provide more details about the project and to answer any questions. All employees working in the OR were invited to participate. Senior personnel from different job roles were asked to encourage staff to use the tool.

A total of 269 staff members utilised the tool at least once over the trial period (78% response rate) and 569 submissions were received. Participants consisted of 123 nurses (20 senior nurses) (45.7%), 41 anaesthetic technicians (15.2%), 31 anaesthetists (incl. registrars/fellows (11.6%), 36 surgeons (incl. registrars/fellows) (26%), seven orderlies (2.6%), four healthcare assistants (1.5%), two anaesthetic technician trainees (0.7%), seven respondents who identified as 'other' (2.6%), and 18 respondents who chose the option that 'I'd rather not say.' Daily utilisation was estimated at 21% response rate (exact figures of total number of staff within the department on any given day is almost impossible to ascertain). Individual tool utilisation per participant ranged from one to 14 entries (1= 62%, 2–3 = 23%, 4+ = 15%). The first author went to the hospital each day of the trial to ensure that the iPads were working and answer any questions staff may have had. This allowed for further relationship building and discussion with staff.

The daily job satisfaction response scale was converted to a numerical 5-point scale for analysis (i.e., 1 = "great, I love my job today" to 5 = "awful, get me out of here".) On average 71% (ranging from 52% – 79%) of participants reported a 1 or 2 each day. No significant differences in job satisfaction were found among staff with different job roles or department specialties when comparing job-satisfaction mean scores. However, participants who chose 'I'd rather not say' for job role and speciality were more likely to have a lower mean score than other participants. On analysis of factors that influenced job satisfaction responses, positive responses (i.e., 1 or 2) were most commonly influenced by 'relationships and communication with colleagues' (34% and 39%, respectively) and 'the nature of the clinical work' (29% and 28%, respectively). Negative responses (i.e., 4 or 5) were most frequently influenced by 'organisational factors (e.g., workload, staffing, equipment)' (33% and 33%, respectively) and also 'relationships and communication with colleagues' (29% and 33%, respectively).

2.4 Reflection / evaluation (validation / improvements)

The feedback and validation survey was administered one week following the completion of the trail. It resulted in 38 responses (a 14% response rate). Sixty-one percent of respondents

reported that they thought it was either a 'good' or 'extremely good idea' to implement a tool such as this permanently. The most commonly reported barriers to using the tool were 'forgetting to use the tool' (36%) and 'being too busy' (31%). Four themes were identified from the qualitative comments on the survey: 1) feeling positive about the tool. For example, respondents indicated that *"It was good. very easy and quick to fill in",* "*The morale-o-meter got the conversation started within the theatre"*, *"Doing this every day, made me appreciate my job more";* 2) questioning its accuracy. For example, participants stated that *"I saw people fill it in when they were cheesed off about something but not when they were happy" "I'm not sure how accurate people were answering the survey, which would be interested to find out in the result";* 3) concern about how it will lead to change. For example, some employees stated that *"Not sure if it's actually going to improve morale. or make anything happen. but if it gives it a chance to improve, I will do it" "Providing the solution is the battle;* 4) would prefer the tool for short periods. For example, staff indicated that *"I'd be more inclined to make an effort for a short period of time," "It would be forgotten about and usage would die off if it was a permanent thing."* These themes were consistent with the researchers' journal notes regarding the conversations with staff during the trial period.

Matching the daily survey and the validation survey via the Morale-o-Meter username led to a final sample of 31 participants, who were included in the validity analyses. The mean number of entries per participant in the validation survey was 4.3 (median 3, range 1–14). Significant relationships of daily-level job satisfaction with overall job satisfaction (coefficient=0.78, SE =0.16, $p<0.01$), emotional exhaustion (coefficient= -0.51, SE=0.2, $p<0.01$) and affective commitment (coefficient=0.77, SE=0.11, $p<0.01$) were found, supporting the construct and predictive validity of the daily measure of job satisfaction.

The results of both the trial and feedback / validation survey were reported back to staff and managers as planned and an in-depth written report highlighting the strengths, weakness and areas for improvement for future trials was generated. The hospital then took over the tool for further trialling.

3. Discussion

This study aimed to meet a specific need within a New Zealand OR department by using a collaborative action research approach to develop a daily job satisfaction tool. The results describe the benefits, challenges and complexity of using an action research approach, and offer a unique perspective into how action research can support traditional tool development principles in the OR setting. In addition, the inter-professional aspect of our study is an important point of difference, often overlooked in action research conducted in the hospital setting (Montgomery et al., 2015).

The combination of the four overarching action research stages (problem identification, planning, intervention and reflection) provides the complete picture of the Morale-o-Meter study. The ultimate goal was to create a tool which was operationally meaningful and practical, without compromising quality or validity. As the project progressed, each stage opened the door for more consultation and collaboration as hospital personnel became increasingly involved. The *Problem Identification* stage provided sound theoretical foundations for the

study and developed the trust and respect between researchers and practitioners required for the stages to follow. The *Planning* stage was by far the most complex and challenging, often highlighting the tension between meeting the academic rigor versus the operational outcomes of the project, a common issue for action research (Huang, 2010). An additional contribution for researchers during this stage was facilitating communication between middle and senior management regarding the purpose of the tool. The *Intervention* and *Reflection* stages essentially provided the platform for consulting with the wider staff 'on the floor' as well as testing usability and validity. Providing an initial trialling period of the tool also allowed employees to become familiar with the concept of the tool, and enabled informed feedback via the survey on completion.

The outcomes of the study found that the Morale-o-Meter tool has potential to provide meaningful information for managers in real-time. It not only captures how staff are feeling about their jobs, but identifies valuable information regarding influential factors on organisational practices, thus allowing for the development of timely and targeted interventions. In addition, the validity analysis provides initial support for the construct validity of daily job satisfaction with overall satisfaction. Consistent with similar studies in other settings using ecological momentary assessment methods, the significant and positive relationship between daily job satisfaction and overall job satisfaction provides some reassurance that the tool is measuring the intended construct (Ilies & Judge, 2004). Consistent with the existing literature (Samadi Miarkolaei & Samadi Miarkolaei, 2014; Tsigilis et al., 2004), we also found significant relationships of daily satisfaction with affective commitment and emotional exhaustion, which suggest the tool could also be of use in predicting the risk of burnout and the level of organisational commitment. While we acknowledge that burnout and organisational commitment are influenced by numerous personal and professional factors, job satisfaction has been repeatedly proven to be one of the most significant influencing factors of these constructs and therefore is of significant value (Meyer et al., 2002; Tsigilis et al., 2004).

The study also provided insight into areas of the tool development that require further attention. While the majority of those who completed the survey were positive and the overall response rate and interest in the project was high, 62 % of staff used the tool only once during the trial. Key themes from the survey suggest that many forgot or were too busy, and some staff members were sceptical about whether the tool would result in positive change. This is valuable feedback for managers suggesting that attention to building trust with staff, establishing robust response plans, and ensuring transparency, need to be a priority. In addition, it suggests that as the hospital conducts further trials, consideration is needed as to how the tool can become an embedded part of daily routines along-side other existing requirements. Frameworks such as the Consolidated Framework for Implementation Research will support such a process as strategies to support long term implementation are developed looking forward (Damschroder et al., 2009).

One of the important characteristics of action research is the collaboration between researchers and stakeholders (Costello, 2003). This was a key component of our study – working together, predominantly with managers (who also work within the OR), to achieve an outcome that benefited the wider workforce. Meeting the technical, practical, and emancipatory aims of action research in the hospital setting, however, is not straight forward, nor (being action research) should we expect it to be (Huang, 2010; Montgomery et al., 2015). Working across the different job roles and levels of seniority creates an interesting challenge for researchers, and requires effective communication strategies, which involve listening to

and sharing information respectfully and positively until agreement/compromise is found (Kjellström & Mitchell, 2019). In our study, facing conflicting feedback from employees from different job roles and at different levels of the hierarchical structure was challenging at times. Each role brought its own unique perspective, highlighting the wider political frame in which we were working. This process raised the question of who holds the power to make the decisions, regarding whether some feedback is taken into consideration but other feedback is disregarded. For example, would feedback relating to orderlies be considered with the same value as feedback relating to the surgeons? In keeping with the emancipatory aims of action research, we did our best to advocate for those with less of a voice, presenting and discussing all feedback gathered equally (Brydon-Miller et al., 2003; Huang, 2010).

The research process will also have created change within the workplace environment. Reflexivity by researchers is essential in action research and is often forgotten in the evaluation of action research studies in the hospital setting (Montgomery, 2014). It includes acknowledgement of how each interaction or discussion by the researchers will have likely influenced practitioners, changing perspectives and influencing further discussions and actions (Kjellström & Mitchell, 2019). This was captured in qualitative comments in our study such as: "*The morale-o-meter got the conversation started within the theatre"* and *"doing this every day, made me appreciate my job more"*. Further, it is likely that the process of the researchers working alongside senior management would have played both a positive and negative role in how the study was received by staff members. Ultimately, our presence would have impacted the environment long before the trial began, and these dynamics are an inevitable reality in action research.

The experience of this project from the researchers' perspective was stimulating, rewarding, and challenging; as we worked along-side hospital personnel with the common goal of creating meaningful change in a real-world setting (Byron-Miller et al., 2003). Four key central themes from the study capture the learning from a researcher's perspective: 1) the importance of building sustainable relationships with key stakeholders; 2) maintaining positive, respectful, and regular communication; 3) building trust between researchers and staff at all levels; and 4) having patience. These themes are consistent with insights commonly identified in action research (Huang, 2010; Kjellström & Mitchell, 2019; Montgomery et al., 2015).

Limitations

Due to the limitations of conducting research in this hospital setting, focus groups and interviews were not possible. While the small sample size from one single hospital limits the generalisability of this study, the outcomes provide a good starting point for longer trials across multiple hospitals. The low response rate at the daily level, as well as the feedback and validation survey, may result in a biased sample. Lastly, any study that uses self-reporting comes with the risk of common method biases (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Conclusion

This study offers insight and guidance into the practical application of action research within an interprofessional healthcare setting. While using collaborative action research in the OR setting is not without its challenges, it is essential that research and instrument development are meaningful, practical, valid and relevant to the real-world setting. This study achieved the overall aim, which was to collaborate in the initial development and trialling stage of a tool for measuring job satisfaction in the OR setting. With further trialling, the Morale-o-Meter has the potential to be a powerful and valid tool in the OR setting, allowing one to view and value job satisfaction in real-time along-side other key performance indicators. This study provides a sound starting point for the tool to continue to be developed, with potential for implementation in wider healthcare settings in the future.

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