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EDITORIAL

COVER: The use of a word cloud is used to highlight the complex range of contexts raised in the artices contained in this issue.

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Responding to the Call for Innovation: how do we develop health professionals' skills and operationalise innovation?

In a recent online open forum of the Association of University Programs in Health Administration (AUPHA) two of our American colleagues were discussing the need for a greater focus in health management curricula on 'transformation'. [1] They indicated that some time ago the American College of Healthcare Executives identified key skill areas for healthcare leaders as 'operational, people, and transformation', suggesting that good progress and focus on the first two had been achieved while more focus on the third was required. The discussion suggested that 'the area of transformation' needed to 'specifically include skills in intrapreneurship and also innovation'. [1] Intrapreneurship is a term used to distinguish activity within an organisation as opposed to wider concepts of entrepreneurship. Generally across health systems there is said to be 'a drive to roll out innovative models of care that will deliver better value for money and improve the quality of care'. [2, p.1] Innovation in health is in part being driven by legislation in the United Kingdom and the United States. There is of course, a similar emphasis in Australia. Adopting innovation in healthcare, is occurring 'at a scale…[that] is increasingly viewed as crucial to the long-term sustainability of health systems'. [2, p.1]

Innovation is not a new concept. An article by Pierce and Delbecq [3] published in 1977, reviews research from as far back as the 1950s. These authors explore a range of definitions of innovations and opt to support that of Thompson [4] defining innovation as 'the generation, acceptance and implementation of new processes, products, or services for the first time within an organisation setting'. [3, p.28] They go on to focus on 'initiation, adoption and implementation' as the phases of innovation. [3, p.29] In terms of predictive variables supportive of innovation they suggest that 'differentiation, professionalism, decentralisation, environmental uncertainty, large organisation size and inter-organisational interdependence will be positively related with organisational innovation'. [3, p.30-32] 'Formalisation, stratification and age' are described as negatively related. [3, p.30-32] In terms of individual attitudes and values 'job satisfaction, involvement, performance dissatisfaction, intrinsic motivation and values of decision-makers' are positively related. [3, p.33] They suggest that organisations which are more organic in structure are more disposed to be innovative in the generation and acceptance phases but may well falter when it comes to the adoption phases, where they are not as successful, while mechanistic organisations are predisposed to resist change. [3]

Much has been researched and written about innovation including the view that 'innovation is often (mistakenly) regarded as uniformly positive' [5, p.i47] and that innovation is often adopted without adequate evaluation and proven benefits. [2] The paradoxes inherent in innovation are described as the 'uptake of the dubious, rejection of the good'; 'the wisdom and failings of democracy'; and 'health systems are never able to keep up'. [5, p.i47-i49] Innovation in healthcare needs to 'recognise the risk and costs of innovation, have effective systems for controlling its diffusion, study and collect data as it occurs, use adoption and implementation studies, clarify lines of authority, use 'phase one' studies to identify potentially unwanted, unhelpful effects and improve the training of health professionals to deal with the challenges'. [5, p.i50]

Plesk [6] in taking a complex adaptive approach to innovation and organisations in healthcare makes five recommendations for the adoption of innovation. These recommendations are summarised and abridged as: eschew mechanistic and coercive approaches; establish research and development (R&D) functions within the organisation to focus on innovation; devote considerably more attention and effort to social networking in healthcare as being essential to the goal of spreading innovation; seek to establish a habit for change in healthcare organisations; develop better language and tools to support the creation of more receptive contexts for change. [6] Fitzgerald and colleagues also suggest from an organisational perspective that innovation is context specific. Primary health care (PHC), for example, is an abstract concept that doesn't fit easily with a notion of innovation in an organisational context as it 'has little history of collective, inter-practice collaboration' and that 'partnerships have to operate through consensus and persuasion rather than through hierarchy and power'. PHC operates in the context of networks rather than hierarchies. [7, p.226] There is also extensive evidence that adoption of innovation is difficult and that 'scientific research evidence needs translating to suit local contexts'. [7, p.226] These authors suggests that management requires a 'facilitative, negotiative approach, that builds collaborative relationships and that opinion leaders are required to lead targeted improvements' with some focus on the values of those involved. [7, p.226]

Following a systematic review of the diffusion of innovations, Greenhalgh and colleagues [8] provide a definition of innovation in service delivery in organisation as:

> A novel set of behaviours, routines, and ways of working that are directed at improving health outcomes, administrative efficiency, cost effectiveness, or users' experience and that are implemented by planned and coordinated actions. [8, p.582]

These same authors in their comprehensive review of innovation research pose some interesting questions yet to be adequately answered, such as:

> How are 'good ideas' in local healthcare systems reinvented across systems and networks?
>
> How can we identify bad ideas and prevent them and what is the nature of interpersonal influence and opinion leadership in the range of different professional and managerial groups?
>
> What is the nature and extent of the social networks of different players in the health service (both clinical and nonclinical)?
>
> Who are the individuals who act as champions for organizational innovations in health services?
>
> Who are the individuals who act as boundary spanners among health service organizations? [8, p.618]

The above quotation demonstrates the complexity for individuals and organisations to become proficient in the innovation context because they raise questions for us all of:

> To what extent do 'restructuring' initiatives (popular in health service organizations) improve their ability to adopt, implement, and sustain innovations?
>
> How can we improve the absorptive capacity of service organizations for new knowledge?
>
> How can leaders of service organizations set about achieving a receptive context for change?
>
> What is the process leading to long-term routinization … of innovations? [8, pp 618-619]

A further meta-analysis of team level predictors of innovation at work by Hulsheger, Anderson and Salgado [9] suggests that 'team process variables display substantial and generalizable relationships with innovation.' [9, p.1137] The analysis suggests that there needs to be a focus on 'providing groups with high norms for innovation' in an 'open to change and error friendly' climate. Teams should have 'clearly stated, shared and visionary goals' and be interdependent in reaching them and their own personal goals. Communication and networking both also need to be enhanced. [9, p.1140]

Dopson, Fitzgerald and Ferlie [10] place the emphasis on context as an active component in the process of change and innovation. They suggest that for context to be receptive there needs to be the 'availability and engagement of local, credible and skilled opinion leaders; the presence of sound inter-professional relationships; an understanding of the structural characteristics and configurations of the various organisational characteristics, the support of senior management, albeit at a distance and; project and change management skills availability'. [10, p.228] They emphasise that leadership is more likely to be effective where: it is distributed; issues of professional power are understood; complex social relationships are acknowledged and discussed; talent from all corners is harnessed; and the contribution of different perspectives is valued. [10, p.229]

Innovation is currently proposed as a response to perceived crises of an ageing population, a growing chronic disease burden and ever increasing healthcare costs. However, Braithwaite and colleagues suggest that this quest for innovation is a direct consequence of the current healthcare model having reached the end of its innovation life cycle. That model is seen as 'predicated on industrial thinking and disease management' when what is required is a 'shift to a wellness-orientated system focused on performance and outcomes' and that this will need to be based on 'a new values based system' if we are to reinvent healthcare to be focussed on 'wellness and performance'. [11, p.259]

Innovation in healthcare is important in responding to more recent market and public sector performance regimes; because of the growth in health and biotechnologies; and to better enable diffusion of information. [12, p.78] Innovation is difficult in healthcare where professional autonomy and discretion exist; where systems are designed to co-ordinate problems and not easily allow innovation to occur; and where strong professional and political ties exist outside the organisation that have a propensity to influence internally. [12] Intrapreneurship is used by some to describe what occurs within the organisation as opposed to entrepreneurship that has the wider contexts of operating across organisations and the myriad of networks and collaborations that exist in healthcare. Some regard intrapreneurship as 'orientated towards organisational mission and goals' and 'to innovation in clinical processes...'. [12, p.80]

Healthcare organisations that are serious about innovation need to do so from a governance perspective and view all health professionals, managers and leaders as innovators. They need to map and manage knowledge and operationalise innovation. The practice of innovation involves social engagement and learning. This requires the development of communities of practice and networks of practice both within the organisation and across organisational boundaries that can involve some distance between participants as distributed networks of practice (DNOP) that require proper support by organisations but also be given space and discretion to achieve their purpose. [12,13]

Innovation is not a simple concept easily adopted and managed and the curricula to be developed for health professionals and managers, cross paradigms and disciplines. Responding to the issues, challenges and questions posed by the literature and described herein, requires contributions from researchers and from those charged with operationalising innovation. This suggests that the learning might best be situated in cross discipline, participatory and collaborative, action-based research activities, involving health professionals and researchers working together in real life contexts. So like our colleagues mentioned at the start of this Editorial, how would you go about developing an adequate curriculum in your program or operationalising innovation in your organisation?

DS Briggs
Editor

References

1. AUPHA 2016. Association of University Programs in Health Administration – Open Forum on transformational leadership between B. Archer Concordia University and D. Berman, Walden University. Jan 11, 2016. Available from: https://mail.google.com/mail/u/0/#search/aupha+open/152345ce5e8f0324
2. Wilson PM, Boaden R, Harvey G. Plans to accelerate innovation in health systems are less than IDEAL. BMJ Quality & Safety Online First. 2015. Available from: http://qualitysafety.bmj.com/content/early/2015/12/23/bmjqs-2015-004605.full.pdf+html
3. Pierce JL, Delbecq AL, Organisation structure, individual attitudes and innovation. The Academy of Management Review. 1977; Jan. Available from: https://www.researchgate.net/publication/271688857
4. Thompson VA. Bureaucracy and Innovation. Administrative Science Quarterly. 1965;10:1-20.
5. Dixon-Woods M, Amalberti R, Goodman S, Bergman B, Glasziou P. Problems and promises of innovation: why healthcare needs to rethink its love/hate relationship with the new. BMJ Qual Saf. 2011; 20(Suppl 1):i47-i51. doi:10.1136/bmjqs.2010.046227.
6. Plesk P. Complexity and the adoption of Innovation in healthcare. Accelerating Quality Improvement in healthcare strategies to speed the diffusion of Evidence Based- innovations Conference Washington, D.C. January 2003. National Institute for Health Care Management Foundation National committee for Quality Health Care. Available from: http://www.nihcm-old.com/pdf/Plsek.pdf.
7. Fitzgerald l, Ferlie E, Hawkins C. Innovation in healthcare: how does credible evidence influence professionals? Health Soc Care Community. 2003;11(3):219-228.
8. Greenhalgh T, Glenn R, MacFarlane F, Bate P, Kyriakidou O. Diffusion of Innovations in Service Organisations: systematic review and recommendations. Milbank Q. 2004; 82(4):581-629).
9. Hulsheger UR, Anderson N, Salgado JF. Team-level predictors of Innovation at work: A comprehensive Meta- Analysis spanning three decades of research. Journal of Applied Psychology. 2009; 94(5):1128-1145.
10. Dopson S, Fitzgerald l, Ferlie E, Understanding change and innovation in healthcare settings: reconceptualising the active role of context. Journal of Change Management. 2008; 8(3-4): 213-231. Available from: http://www.tandfonline.com/doi/abs/10.1080/14697010802133577
11. Braithwaite J, Skinner CA, Döéry ML. A values based health system. Med J Aust. 2011; 194(5):259-262.
12. Lega F. Strategic, organisational and managerial issues related to innovation, entrepreneurship and intrapreneurship in the hospital context: Remarks from the Italian experience. Journal of Management and Marketing in Healthcare. 2009;2(1):77-93.
13. Briggs DS. Networks, democracy, innovation, pumpkins and pimples. A Pac J Health Manag. 2012;7(1):4-5.

IN THIS ISSUE

Our cover utilises a word cloud design to reflect the range and complexity of issues raised by our authors in their articles. In our first article, Day and South provide an analysis of management practice that questions health systems improvement as a means of achieving real gains and also asks if it is unnecessary work. They question if these approaches can be effective in avoiding major systems failures while supporting the relevance of timely, effective performance measures at the organisational level rather than comprehensive data analysis that does effect improvement.

Radford and her colleagues present a research article that reports the development of a framework utilising participatory action research for the translation and implementation of new practices called PARTI and describe the context as balancing the Yin and Yang. This article will be of interest to those amongst our readers who are interested in change management and knowledge translation.

Messum, Wilkes and Jackson also provide a research article that examines employability skills in health service management from the perceptions of recent graduates. This is part of a wider study and it suggests that generic skills were more important than job specific skills for the participants and the conclusion encourages closer engagement of universities and employers particularly through placements.

Rogers and colleagues provide a research article that examines the importance of the physical environment for child and adolescent mental health services. The environment is examined from the subjective perspective of clients and from the work satisfaction of the clinicians. While clinicians were less positive in their appraisal of the physical environment compared to clients there was a strong association between the clinician's appraisal of the physical environment and overall work satisfaction.

The development of a consumer engagement framework is the subject of a research note by Kennedy, Lizarondo and Kay and canvasses what might need to be done to plan for engaging baby boomers. The authors have developed a planning process framework and they plan to undertake a validation of the model. Pilbeam, Ridoutt and Baldrick present a research article that examines best practice pathology collection in Australia. Through the use of case studies, best practice and the relationship through training are assessed. Minimum qualifications are proposed as is the need for strong policy around collection, storage and transport of specimens.

Dwyer provides a research article about the use of clinical registries to provide clinically credible monitoring and benchmarking of clinical practice. A mixed methods approach was utilised to document the level of medical staff involvement in clinical registries in one Australian teaching hospital. The article identifies that there is a lack of systematic reporting of registries data into quality committees beyond unit level and there is a need for greater cross sharing of data across specialities. Roder and colleagues provide a further perspective on the use of linked data from the NSW Cancer Registry and hospital lung cancer data to raise discussion points on how to improve outcomes. They conclude that linked cancer registry and hospital data can increase the system wide understanding of local health service delivery and prompt discussion points on how to improve outcomes.

Our final article in this issue reports research on factors affecting hospital choice decisions through an exploratory study of healthcare consumers in northern India. This research by Kamra provides interesting insights into the context and approach to healthcare delivery in one country that should interest the wider readership in considering how choice is exercised in different contexts as we continue down a path were market influences appear to becoming more influential in healthcare. Our Librarian, David Burt also continues a tradition of proving a contemporary library bulletin for the use of health professionals interested in the management of health systems.

Improving the Health System with Performance Reporting – Real Gains or Unnecessary Work?

G E Day and L South

Abstract

Aim: This paper will discuss current approaches to performance reporting and whether there are real benefits to healthcare organisations or whether it is a time consuming activity that adds little to improving quality healthcare and organisational performance. Most importantly, this paper will argue that performance reporting will not prevent another major healthcare scandal, such as that seen at Bundaberg Hospital or NHS Mid Staffordshire Trust. The paper will also outline learnings for Australia from other health systems where performance reporting is part of management practice.

Approach: While performance reporting is largely designed to increase the efficiency and effectiveness of healthcare organisations, this paper will explore the approach from a practical managerial perspective.

Context: This paper explores performance reporting across a range of Australian healthcare organisational settings to highlight differing approaches to improving performance.

Main findings: Performance reporting can be an effective tool to improve organisational performance. For performance reporting to be successful, managers and clinicians need to work collaboratively to identify areas for performance improvement and useful measures to address these. Additionally, organisations must choose a meaningful suite of measurements that can help drive performance improvement. Real time performance reporting, such as through performance dashboards, provides managers with the opportunity to make timely, incremental improvements. Finally, performance reporting must be done in a way that does not detract from providing safe, quality patient care.

Conclusions: Performance reporting can be a useful management tool for healthcare organisations, however organisations must consider timeliness of performance reporting and select a number of measurements that have impact for their given facilities and avoid the wholesale analysis of data that has little opportunity to improve practice or performance.

Abbreviations: LHN – Local Health Network;
NEAT – National Emergency Access Targets;
NHPA – National Health Performance Authority.

Key words: performance reporting; efficiency; safety; quality.

Gary E Day
School of Medicine
Griffith University
Gold Coast, Queensland, Australia.

Linda South
Essential Services Commission of South Australia
Adelaide, South Australia, Australia.

Correspondence:
g.day@griffith.edu.au

Introduction

There has been much recent interest in the collection, analysis and dissemination of data to demonstrate improved health system performance. [1-4] Healthcare organisations have taken a range of approaches, from basic spreadsheets and graphs to sophisticated data analysis and systems, to drive organisational performance. Despite these various approaches, and costs associated with performance reporting, the question remains as to whether performance reporting fundamentally improves health systems or burdens them with unnecessary and unproductive work. This paper will explore key challenges in performance reporting, analyse the relative benefits of this approach and outline what we might learn from other health systems that are focussed on systems improvement through performance reporting.

Analysing the issue or problem

Healthcare organisations have a growing data collection, analysis and distribution responsibility, not only to internal customers such as managers and clinicians, but also to an increasing number of voluntary and compulsory external agencies such as the Private Health Insurance Administrative Council; respective state health departments; the Australian Council on Healthcare Standards; the Health Roundtable; Australian Commission for Safety and Quality in Healthcare; and the National Health Performance Authority (NHPA). For example, the NHPA, initially established in 2011, [5] was established to monitor and report on the performance of local healthcare organisations including Local Hospital Networks (LHN), public and private hospitals, and primary healthcare organisations and other community related organisations that provide healthcare services. This public reporting organisation provides data on two main streams of activity, namely: aspects of Hospital Performance and Healthy Communities. Hospital Performance reports include analysis of activities such as patient times spent in Emergency Departments (National Emergency Access Targets [NEAT]); infection rates; hand hygiene and length of stay in acute hospitals, whereas Healthy Communities reviews issues such as: obesity; immunisation rates; maternal and child health; and General Practitioner care of chronic illnesses. From a health manager's perspective, the NHPA reports provide important broad and retrospective data on a range of hospital and broad health service performance measures. At best these reports can be used for benchmarking, but provide little in terms of real time data, at the disaggregated level, to correct current practice or performance at a local level.

While it would seem on face value that performance reporting is a worthwhile approach to improving quality and efficiency, [6,7] the research is divided on the topic. Public reporting of performance data no doubt has some effects, but the most convincing effects are on quality improvement activity, not on clinical outcomes. [8,9] Additionally, considering the amounts of data available, efforts to make data available across the system, have to date been partial and fragmented. [10] In addition, international evidence suggests that limited progress has been made in integrating even the existing measures into healthcare organisations. [4] More tellingly, Walley, Silverster and Mountford argue that '…measurement systems disguise failed decisions and encourage managers to take a low-risk approach of "symptomatic relief" when trying to improve performance metrics. This prevents many managers from trying higher risk, sustainable process improvement changes. The behaviour of the healthcare system is not understood by many managers and this leads to poor analysis of problem situations'. [11, p.93]

The evaluation of public reporting is complex because there is a lack of data that would truly allow the ability to isolate the effect. [12] Krumholz argues that outcomes have not changed much with public reporting, and there may be other explanations for reported improvements in health service outcomes. For example, fewer patients may be undergoing procedures, however it cannot be known if access is being restricted or more judicious decisions are being made. In the end, substantial uncertainty remains about what is being currently achieved with public reporting. [12]

Management approaches

From a theoretical perspective it can be argued that performance reporting can and should be of value in the health and hospital context. [6,7] However, it could be suggested that in practice there is a wide variety and maturity of performance reporting across healthcare organisations in Australia, even within the same jurisdiction.

An interesting comparison in the practice of performance reporting in public sector health delivery environments can be illustrated across two Australian states – a metropolitan tertiary hospital for a large LHN in South Australia, and a regional hospital/healthcare service in a geographically spread Local Health District in New South Wales.

In considering performance reporting at a LHN and individual hospital/healthcare service level, firstly the question of what is being measured is important. While the size and complexity is different, the experience in these two settings is similar with broadly four domains (quality and safety; service access/patient flow; finance and activity; and people and culture) measured and reported. These domains or areas of performance measure are in part driven at a national level with efficient price (through the Independent Hospital Pricing Authority) and measures of efficiency; [13] however they nonetheless provide a 'balanced scorecard' approach to performance measurement. Interestingly, while the level and detail of performance reporting varies between the two settings there is a consistent strong focus on the service access, and finance and activity domains with less focus on quality and safety, and in these two settings, limited focus on people and culture.

A second question is, to whom is the performance being reported? In these comparative settings, again, there is similarity with who performance is being reported to with a tiered reporting framework evident from the Board and management performance reporting to local clinical councils, departmental heads and clinical managers. Additionally, and often at an aggregated level, health service performance reporting is also reported publically through websites and public reporting documents. [14]

The question of how performance is reported is where there is significant divergence. The two settings in question, and in fact mirrored across other jurisdictions for public sector healthcare environments, including Queensland and Victorian public health systems, show stark contrast in the sophistication and maturity of performance reporting systems. The larger hospital/health services and LHNs have developed, through dedicated performance management resources, high level, matured, and often real time performance reporting. This includes sophisticated performance dashboards with drill-down capability for performance analysis, and suites of reports with flexibility in reporting of targeted performance measurement. On the other hand, the smaller regional hospital/healthcare sites had less sophisticated performance reporting with barriers experienced in timeliness and validation of performance data and limited ability to drill-down and hence explain performance variance at a local level.

Given the contrast in available tools and sophistication of performance reporting in this comparison across these settings – does performance reporting in practice drive system improvement locally and in a broader context? If we consider that 'what we measure matters', [15] then there is a distinct disadvantage in limitations of performance reporting, particularly in respect to timeliness and hence responsiveness to systems improvement. If system access performance, for example NEAT, is only reported on a quarterly basis it is challenging to engage clinical and local managers in improving such performance in a meaningful way. However, if information is available in real time or reported without significant lag time, incremental improvements are much more likely as there is meaning to the performance with local barriers and opportunities to improve strengthened. Additionally, there is a growing interest in a 'whole of health/hospital' approach where performance is measured across the patient journey that engages both management and clinicians in patient experience and systems improvement.

Incremental advancements aside, Australia's focus on understanding health system performance through data interrogation and reporting is still in the developing stage, and challenges remain in integrating data [10,16,17] and providing adequate resources to provide timely information to managers to support decision-making. [3] Despite the challenges from the Australian context, the international literature suggests that performance reporting is a useful tool for systems improvement; however there are lessons to be learned. These key lessons are now outlined.

Outcomes for management practice

Real health system improvement requires a change in approach for some healthcare organisations.

The evidence suggests that healthcare system performance may be improved with an emphasis on primary care, quality improvement and information technology. [18] While this seems obvious, it is much more difficult to achieve. For this to be achieved in Australia there is a need for different sections of the health system and state/national governments to co-jointly develop strategies and policies that drive real improvements. For those operating in secondary and tertiary health, there needs to be stronger linkages to community and primary care to expedite information and communication flow and streamline patient/client access to appropriate services in the right setting in a timely manner. [17]

There needs to be a stronger emphasis on data analysis to drive organisational wide change.

The collection and interrogation of population data or 'big' data is becoming more important in understanding patterns of disease and health outcomes. The pursuit of greater efficiency, through data mining and analysis needs system wide support and partnerships.

What is evident in both the United States and United Kingdom is the close relationship between governmental bodies, non-governmental organisations and the world of academia in public data reporting. Although the same can be said to some extent for the first two components in New Zealand, the involvement of academia has been comparatively limited in Australia. The United States and United Kingdom have measurement systems where academic organisations take large roles. The example of the COMPASS project is clear proof of scope for this in New Zealand. [19]

What is reported needs to be meaningful and useful to the consumer as well as the manager.

While performance reporting is designed in part to demonstrate transparency and public accountability, studies show that the public '…do not search out performance reports, often do not understand them if they do, and make little use of them in their decisions as to where to seek healthcare. When there is a choice of hospital or doctor, the evidence suggests that the advice of friends and family, the long-term relationship with a doctor and the proximity of a hospital are more important than report cards of performance.' [20, p.5] Hospital managers and clinicians need to work collectively to improve patient care [3] through the development of agreed areas for service improvement and the information that needs to be analysed and reported both internally for staff, but also externally for patents and consumers.

System-wide improvement requires system-wide approaches

Don Berwick has been a strong advocate of the 'Triple Bottom Line' approach to systems improvement. [21] Improving the United States healthcare system requires simultaneous pursuit of three aims: improving the experience of care; improving the health of populations; and reducing per capita costs of healthcare. The role of healthcare organisations in this 'Triple Bottom Line' approach includes at least five components: partnership with individuals and families, redesign of primary care, population health management, financial management, and macro system integration. [21] What makes this approach somewhat different is the inclusion of improving the patient experience. This often gets forgotten in the pursuit of systems improvement. What is important to consider is while organisations report on local or internal performance, how does the performance of the organisation impact more broadly on the community it serves?

In recent years the literature has advanced the triple aim approach to include a fourth element, a focus on the workforce. [22-25] Without a committed, educated, efficient and multi-disciplinary workforce it is very difficult to achieve the triple aim, let alone implementing system wide improvements. Staff burnout and poor morale have been associated with lower patient satisfaction, reduced health outcomes, and may increase costs. [22,25] To be successful, organisations need to consider the well being of their workforce at the same time as focussing on patient outcomes. [24]

Make the patient the centre of care and of decisions regarding systems improvement

There is no point in improving the 'system' and reporting on improvements if they are detrimental to the patient or client. Berwick points to this when he talks to 'improving the patient' experience; however it goes further than that. Making the patient the centre of the decision-making process is fundamental to real systems improvement and reporting that makes sense to consumers.

It is relatively easy to be distracted by the process and this can lead to a lack of focus on patient care. As has been clearly demonstrated, part of the issue identified in the Davies Inquiry into the Bundaberg Hospital, [26] and later in the Francis Inquiry into the NHS Mid Staffordshire Trust, [27] was the organisation's focus on chasing 'numbers' and arbitrary targets set by external agencies, often associated with funding, which largely forgot about the patient or client. Additionally, in reviewing the organisations as part of the respective Inquiries, both organisations had cultures that were not patient focussed. 'Performance targets and enforcement, although needed, is not the route to improvement. What is required is a change in culture to drive a system of care that is open to learning, capable of identifying and admitting its problems and acting to correct them, and where the patient's voice is always heard'. [28, p.106] The challenge for healthcare organisations is to create cultures that are patient and performance focussed. The critical success factor is having staff truly see the patient at the centre of care and ensure any performance improvement is aimed towards patient safety, quality and access.

Be judicious in what you measure and report

It could be argued that the current approach and promise of performance reporting does not live up to its potential. A United States analysis of '48 state and regional measure sets found that they included more than 500 different measures, only 20% of which were used by more than one program'. [4, p.2145] Similarly, a study of 29 private health plans identified approximately 550 distinct measures, which overlapped little with the measures used by public programs. [29] Some argue that organisations are in danger of '…measurement fatigue without commensurate results'. [4, p.2145]

Healthcare organisations are devoting substantial resources to reporting their performance to regulators and payers; with one United States health system, for instance, estimating that one per cent of its net patient-service revenue was used for reporting purposes. In addition to the problem of too many measures, there is concern that programs are not using the right ones. Some metrics capture health outcomes or processes that have major effects on overall health, but others focus on activities. [4] What must be understood is that there is no single measure that will improve service delivery and patient outcomes, ensure financial sustainability and increase accountability and transparency in a health system. [30] Australia should be judicious in learning from the United States experience. Chasing systems improvement can be a costly exercise for only minimal gain. 'For every instance in which performance initiatives improve care, there are cases in which our good intentions for measurement simply enrage colleagues or incurred expenditures that produced no care improvements.' [4, p.2147] The guiding principle should be based on '…the understanding that performance improvement requires that clinicians and patients be enabled to make better healthcare decisions by giving them the best available information when and where they need it and making it easy to do the right thing'. [31, p.1953]

Conclusion

In conclusion, there are lessons to be learned, and avoided, in the international experience in the value and application of performance reporting. In Australia, we have seen that there is significant variance in approach and levels of maturity of performance reporting systems across public sector health delivery environments. However, encouragingly the strategies for engagement on improving performance hold a common theme. The 'whole of hospital/health' approaches with the provision of common performance data and reporting across the four broad domains, that engages both management and clinicians, and seeks genuine engagement on patient experience and systems improvement, is an achievable standard. This coupled with continuous improvement over time will no doubt improve transparency and help contribute to real health system performance improvement.

Competing interests

The authors declare that they have no competing interests.

References

1. Hanson R. Good health information – an asset not a burden! Aust Health Rev. 2015;39(1):9-13.
2. Nadathur SG. Maximising the value of hospital administrative datasets. Aust Health Rev. 2010;34(2):216-233.
3. Garling P. Final Report of the Special Commission of Inquiry into Acute Care Services in NSW Hospitals. Sydney: NSW Department of Attorney General and Justice; 2008.
4. Cassel CK, et al. Getting more performance from performance measurement. N Engl J Med. 2014;371(23):2145-7.
5. NHPA. National Health Performance Authority. 2011 [cited 2015 Aug 15]; Available from: http://www.nhpa.gov.au/internet/nhpa/publishing.nsf/Content/home-1.
6. Hafner JM, et al. The perceived impact of public reporting hospital performance data: interviews with hospital staff. Int J Qual Health Care. 2011;23(6):697-704.
7. Veillard J, Tipper B, Allin S. Health system performance reporting in Canada: bridging theory and practice at pan-Canadian level. Canadian Public Administration. 2015;58(1):15-38.
8. Saitz R. Does public reporting of performance data improve quality of care? NEJM Journal Watch. General Medicine. 2008.
9. Pearse JMD. The impact of the public release of health performance data on effectiveness and efficiency. Sydney: The Sax Institute; 2010.
10. Productivity Commission. Efficiency in Health. Canberra: Productivity Commission; 2015.
11. Walley P, Silvester K, Mountford S. Health-care process improvement decisions: a systems perspective. Int J Health Care Qual Assur. 2006;19(1):93-104.
12. Krumholz HM. Does public reporting of PCI outcomes improve patient care? Journal Watch. Cardiology. 2012.
13. Independent Hospital Pricing Authority. Pricing Framework. 2016 [cited 2016 Jan 2]. Available from: https://www.ihpa.gov.au/what-we-do/pricing-framework.
14. SA Health. Our Hospital Dashboard. 2015 [cited 2016 Jan 2] Available from: http://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/about+us/our+performance/our+hospital+dashboards/our+hospitals+dashboards
15. Hendra P. What matters gets measured, and what we measure is what ends up mattering, in Remarks by UN Women Deputy Executive Director Policy and Programme John Hendra, at the CSW58 side event on 'Indicators for monitoring gender equality: lessons learned from the MDGs'. 2014 March 12, UN Women.
16. Connor M, Day GE, Meston D. Successful linking of patient records between hospital services and general practice to facilitate integrated care in a hospital and health service in south-east Queensland. Aust Health Rev. 2015. - DOI: 10.1071/AH15048.
17. Nicholson C, Jackson CL, Marley JE. Best-practice integrated healthcare governance - applying evidence to Australia's health reform agenda. Med J Aust. 2014;201(3 Suppl):S64-6.
18. Gauld R, et al. Healthcare system performance improvement: a comparison of key policies in seven high-income countries. J Health Organ Manag. 2014;28(1):2-20.
19. Chaudhry M, Gauld R, Horsburgh S. Hospital quality-of-care performance measurement and reporting: what New Zealand can learn from the United States and United Kingdom. N Z Med J (Online). 2012;125(1366):51-63.
20. Seddon ME. Reporting hospital performance - a balancing act between accountability and quality improvement. N Z Med J (Online). 2012;125(1366):5-8.
21. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. Health Aff (Millwood). 2008;27(3):759-69.

22. Bodenheimer T, Sinsky C. From triple to quadruple aim: care of the patient requires care of the provider. Ann Fam Med. 2014; 12(6):573-576.
23. Earnest M, Brandt B. Aligning practice redesign and interprofessional education to advance triple aim outcomes. J Interprof Care. 2014;28(6):497-500.
24. Spinelli WM. The phantom limb of the triple aim. Mayo Clinic Proceedings. 2013;88(12):1356.
25. Day G, Minichiello V, Madison J. Nursing morale: predictive variables among a sample of Registered Nurses in Australia. J Nurs Manag. 2007;15:274-284.
26. Davies G. Queensland Public Hospitals Commission of Inquiry Report. Brisbane; Government of Queensland; 2005.
27. Francis R. Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry Volume 1: Analysis of evidence and lessons learned (part 1), in Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry. London: The Mid Staffordshire NHS Foundation Trust; 2013. p. 689.
28. Russell L, Dawda P. Lessons for the Australian healthcare system from the Berwick report. Aust Health Rev. 2014;38(1):106-8.
29. Higgins AVG, McKown L. Provider performance measures in private and public programs:achieving meaningful alignment with flexibility to innovate. Health Aff. 2013;32:1453-1461.
30. Partel K. Can we improve the health system with performance reporting? Canberra: Deeble Institute; 2014. p. 20.
31. Blumenthal D. Performance improvement in healthcare-seizing the moment. N Engl J Med. 2012;366(21):1953-5.

Balancing Yin and Yang: the development of a framework using Participatory Action Research for the Translation and Implementation (Part 1) of new practices

A Fitzgerald, R Ogrin, K Hayes, J Curry, K Eljis and K Radford

Abstract

Context: Despite the demonstrable benefits of many healthcare innovations, embedding research findings into practice has been slow and sporadic. [1,2] Many implementation frameworks exist, however most have been criticised for not having a strong theoretical underpinning. This study addresses this gap by reviewing the current models to propose a new, theoretically driven framework for change management and translation.

Methods: This study is reported in two parts. In part 1, a systematically-based literature review was undertaken. Following this, part 2 included conducting focus groups with academics to verify the model and provide feedback on the new framework.

Findings: The gaps in current implementation frameworks identified include deficiencies in the areas of individual and social behaviour, participatory action, operationalisation and evaluation of the frameworks. The Quality Implementation Framework (QIF) [3] was used to provide the basis to develop a robust extended model, which addressed those areas that were identified as deficient in the current frameworks. By combining the best parts of extant models with a translation and implementation foci, we developed the PARTI model that is underpinned by commitment to change (Ying) and change fidelity (Yang) at each of its four stages, which included a behavioural questionnaire and implementation checklist. PARTI stands for Participatory Action Research, Translation and Implementation.

Conclusions: The implementation of change in healthcare delivery is difficult and demanding, and healthcare managers look to change frameworks for guidance. The PARTI model has been developed to provide a systematic approach to implementing changed practices that is repeatable, reliable and scalable.

Abbreviations: ISF – Interactive Systems Framework;
PAR – Participatory Action Research; PARTI – Participatory Action Research for Translation and Implementation;
QIF – Quality Implementation Framework;
TDF – Theoretical Domains Framework.

Key words: knowledge translation; evidence-based practice; organisation innovation; implementation framework; managing change; healthcare.

Anneke Fitzgerald
IBA
Griffith University
Gold Coast Campus
Southport, Queensland, Australia.

Rajna Ogrin
Royal District Nursing Service
Melbourne, Victoria, Australia.

Kate Hayes
University of Western Sydney
Sydney, New South Wales, Australia.

Joanne Curry
University of Western Sydney
Sydney, New South Wales, Australia.

Kathy Eljis
University of Tasmania
Sydney, New South Wales, Australia

Katrina Radford
Department of International Business and Asian Studies
Griffith University
Southport, Queensland, Australia.

Correspondence:
k.radford@griffith.edu.au

Background

Despite the demonstrable benefits of many healthcare innovations, implementing clinical and operational research findings into practice has been slow and sporadic. [1,2] Improving the uptake of evidence into practice requires effective and feasible dissemination and implementation strategies, [4] underpinned by theory. [5-7] Importantly, these strategies must also be operationalised. In the context of this research, operationalisation is defined as the process of converting conceptual or abstract variables in ways that permit empirical measurement. Therefore, it is necessary to have clear descriptions of all stages and components of implementation models. This clarity ensures fidelity, that is, being as close as possible to that which was planned, and assists in adapting practice changes to each context for implementation, as well as in understanding the core components of the change. This includes understanding what is necessary to define and illustrate so they can be taught, learnt and implemented in typical health settings. This practical approach addresses the measurement of behaviours and practices that provide evidence that changes are or are not effective.

Extant implementation frameworks

A number of theoretically-based implementation frameworks have been developed to understand and improve the dissemination and uptake of evidence-based practice. [7] Other frameworks have been generated by applying theoretical constructs, observing environments in which innovations are implemented, and retrospectively identifying key aspects common to innovations that were successfully implemented. These frameworks describe implementation, using broad terms to name overriding constructs that need to be addressed for implementation to be successful: the 'what and why'. Other frameworks provide descriptions and are passive, providing very little specific and practical detail on the 'how' to put these concepts into practice, that is, their utility in causing change by operationalising strategies. [4]

Another criticism of the behavioural change and implementation frameworks to date has been the lack of theoretically driven rationales for behaviour change: instead they have been developed using practitioner or research intuition. [8-10] This intuitive approach makes it difficult to understand and analyse the processes that underlie effective interventions. [8,9] Theory driven implementation frameworks are important because the interventions are more likely to be successful in establishing direct links between the intervention and behaviour change. In addition, greater understanding of why the intervention works and how this may translate across contexts, populations and behaviours can be gained. [8] In this paper we outline the development of a new, more comprehensive implementation framework that is driven by theory to guide the change process. This paper contributes to the domain of implementation science by connecting several theoretical implementation frameworks, [3,11,12] enhancing them through the inclusion of the Participatory Action Research (PAR) model, [13] and linking them with practical tools to promote the implementation of innovations. [14-19]

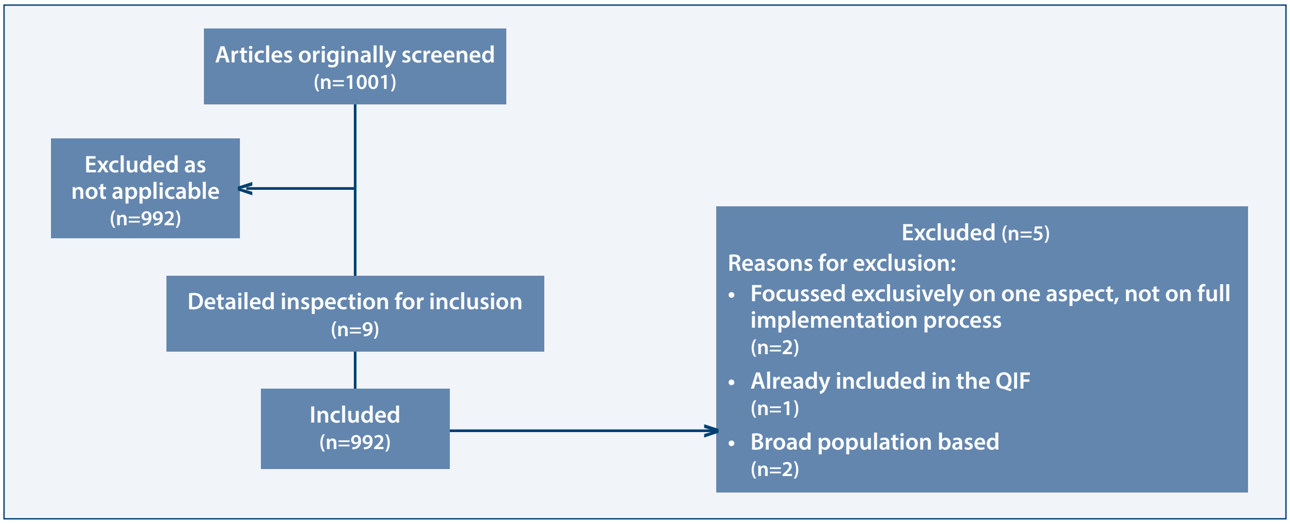
Methods

Part 1

A comprehensive literature review revealed an article by Meyers et al, (2012) [3] incorporating 25 frameworks into the development of their Quality Implementation Framework (QIF). However, the Meyers et al review described articles only up until 2011. Whilst the framework and checklist included in the QIF is comprehensive, we first updated the literature review and, second, identified missing items that help identify the behavioural tipping point(s) for accepting or not accepting new behaviours at the individual, group and organisational levels. That is, a critical point in a situation, process, or system beyond which a significant and often unstoppable effect or change takes place *(Merriam Webster Dictionary)*. Therefore, a systematically-based review of the literature was undertaken from 2011 until June 2013, led by the second author, of the social sciences, education, management and health sciences literature, using ABI Inform, Pubmed, Psych Info, Web of Science and Medline OVID databases. Search terms included the following: Implementation AND Knowledge Translation AND (Framework OR Model OR theory) AND (approach OR Strategy) AND (innovation OR evidence based). Only English language, full text and peer-reviewed articles were included. Titles and abstracts were initially reviewed to ensure a new framework was being described, rather than the application of an existing framework. However, if the article described a new combination of a number of frameworks, this article was included in the full text review as a novel framework. Figure 1 outlines our process of enquiry.

From this review, we identified that there were frameworks developed prior to 2011 that were not included in the Meyers et al review, [3] but could potentially be useful for our purposes. Snowball sampling was used to identify articles concerning previously developed implementation frameworks through existing reviews, reference lists, presentations and reports available online. We do not claim this search is exhaustive, but the approach reflects

Figure 1: Flow diagram of the sources for the new implementation frameworks, from 2011 – June 2013



our focused attempts to include models that contained additional information that could add to the Meyers et al QIF. [3]

Part 2

Following the Part 1 search strategy, in mid 2014 a focus group discussion with five academics and two consultants was undertaken to analyse the QIF, and how this framework could be used in different contexts. The group met during a writing retreat over two days and consisted of authors of this paper and academic colleagues with an interest in implementation science. The members of the focus group worked through each step of choosing and implementing a hypothetical innovation using the QIF, to determine whether this framework provided sufficient guidance for the process of ongoing implementation and to identify gaps. For example, we considered the scenario where a new guideline for best practice in wound care had to be implemented in a community setting and applied the framework to this situation. We found that the framework was incomplete, as it seeks compliance, rather than routinisation into new practices. This led to further investigation of frameworks referenced by Meyers et al. [3] Searching for other frameworks within individual and social behavioural research was productive. [8,20-23] At this point, the PAR model [13,24] was included to help individual clinicians reach the point at which not changing practice is no longer an option; called the 'tipping point'. Authors who published in these fields were identified by the academics involved in the focus group, to provide an initial sample of articles.

Snowball sampling was then undertaken to identify additional relevant articles through existing reviews, reference lists, presentations and reports available online. Various checklists, guidelines and manuals developed for the operationalisation of frameworks were included in the search. Further, some authors were personally contacted for additional information, especially when it was found that further extensions of frameworks were under development.

All of the frameworks were then evaluated by the research team, through identifying constructs that influence implementation based on the strength of conceptual or empirical support, alignment with our own findings and experiences, and potential for measurement. Constructs were deemed useful if they addressed gaps within the QIF identified by the focus group.

The emphasis of Part 2 was to complement and extend concepts already included in the QIF in order to generate a framework that was more complete, and, more importantly, that could provide an operational guide that could be faithfully adhered to in different contexts. In total, 1001 articles were identified in the review, and after reviewing titles and abstracts, nine full text reviews were undertaken. The other studies were excluded as they were not relevant to the task, which was to support merging and improving through extension the existing frameworks.

Results

An overview of 'where the literature is at'?

The original QIF framework [3] includes 14 critical steps within four phases. The majority of the critical steps are within the pre-implementation period of Phases 1 and 2, aiming to prepare both the organisation and people for the implementation of change (e.g. innovations or updates to evidence-based practice). Phase 3 describes the ongoing structural requirements once implementation begins, and Phase 4 outlines improving future applications.

Using the search strategy described above, the literature review from 2011 – 2013 resulted in nine relevant papers. After reading the full text, four studies had valuable ideas, additional to those already existing in the QIF and five were discarded because the QIF already included them, or they involved projects that did not lead to specific population intervention outcomes, rather providing information on broad, population-based innovations. The additional four frameworks generated from 2011 – 2013 added further detail in understanding the complexity of knowledge translation from research to standard practice, and emphasised:

- the need for communication,
- the importance of the role of leader champions,
- the importance of making the framework practical, and
- that the adoption of change is an individual behavioural issue.

Outlined in Table 1 are the different facets of the developed frameworks that would address some of the necessary components of implementation, however we also identified that critical aspects are missing from all the frameworks explored. In particular, both parts 1 and 2 of this study identified gaps in the areas of: individual and social behaviour, participatory action, operationalisation of the framework and evaluation of the framework. This is consistent with the current limited efficacy of implementation of change into practice. At this point, it is important to note that existing frameworks may well sufficiently promote uptake of evidence into practice, and the issues may lie more in flawed implementation of the frameworks. However, we suggest that frameworks must include sufficient information to support commitment to implementation, and that this is deficient in existing frameworks.

Table 1:

AUTHORS AND FRAMEWORK/MODEL	DESCRIPTION	KEY QUESTIONS ANSWERED
Rusly, Corner and Sun (2012) [25]	Provides an in depth theoretical explanation of the multidimensional and multilevel characteristics of readiness for change.	'Why'
Layde, Christiansen, Petersen, Guse, Maurana and Brandenburg (2012) [26] EDCHIP model	A compilation of the CHIP [27] and RE-AIM frameworks, [28] incorporating evidence-based public health frameworks in the planning phase, translating evidence-based interventions into community practice and emphasising communication with key stakeholders.	'What and How'
Palmer and Kramlich (2011) [29] MKIT	Provides an overview of the integration and translation of innovation in the implementation stages of knowledge generation, through a circular process, which indicates the ongoing nature of evidence-based practice uptake. Leaders within organisations must be transformational in order to act as catalysts for change for the framework to be successful.	'What'
Packard (2013) [30]	Focuses on individual human behaviour, focusing on readiness factors, capacity factors and change tactics.	'How'

Table 2:

FRAMEWORK	DETAILS OF FRAMEWORK
The Interactive Systems Framework (ISF)	Provides specific detail relating to operationalising the QIF's first three phases to improve implementation fidelity.
The Promoting Action on Research Implementation in Health Services (PARiHS – revised version) framework	Includes tools to promote fidelity of implementation, however it is, as yet, not comprehensive. [31]
The Consolidated Framework for Implementation Research (CFIR)	Consistent with those developed in the original PARiHS model, [32] but differing in splitting the context into inner and outer settings, and adding a focus on characteristics of individuals. [33] The usefulness of this framework lies in the idea of making the framework context specific. In addition, the authors developed a useful matrix of constructs taken from Greenhalgh et al.'s (2004) seminal work, [34] which helped facilitate the generation of their own new framework.
The Availability, Responsiveness and Continuity (ARC) framework	Uses intervention strategies at the organisational and the inter-organisational levels, and adds to the QIF by adding a clear role for knowledgeable external agents to be involved in the process.
The Quality Enhancement Research Initiative (QUERI)	Incorporates the phases necessary to assure adequate development, refinement, evaluation, and assessment of innovative evidence-based implementation programs and strategies. It involves six steps, with the selection of the issue including an aspect of prioritisation using a formal ranking procedure to guide identification of the area of highest need.

Table Note: Adapted from the Meyers et al [3] review

Investigation of frameworks used to develop the QIF

The frameworks identified from the Meyers et al [3] review that were investigated are included in Table 2.

By combining the tools described in Table 2, the QIF has become a comprehensive tool for the translation and implementation of health innovations. However, the focus group's testing of the model on virtual projects revealed that the current QIF framework pays inadequate attention to individual and social behaviour. This is important because interactions in healthcare settings frequently occur between normally disparate and autonomous professionals.

Existing behavioural change frameworks and the PARTI framework

Due to the need to explain behaviour change in implementation, the authors searched the literature and identified the work completed by Michie et al (2005). [16] This team synthesised the literature in behaviour change to develop the Theoretical Domains Framework (TDF). This model proposed 12 domains contributing to the decisions people made to implement improvements or otherwise change their practice. These domains were: (1) knowledge, (2) skills, (3) social/professional role and identity, (4) beliefs about capabilities, (5) beliefs about consequences, (6) motivation and goals, (7) memory, attention and decision processes, (8) environmental context and resources, (9) social influences, (10) emotion regulation, (11) behavioural regulation, and (12) nature of the behaviour.

Cane et al (2012) [9] then extended this model to 14 domains as a result of a systematic evaluation using a three stage sorting technique. However, upon evaluating Cane et al's (2012) [9] and Mitchie et al's (2005) [16] models as a result of developing a questionnaire for measuring the model, Huijg et al (2014) [10] found more support for Michie et al's (2005) [16] model than Cane et al's (2012) [9] model. Therefore, the TDF was identified as an important inclusion in our implementation framework.

The use of checklists was also deemed important for operationalisation due to the value in providing a simple tool for change champions to communicate the content and sequence of changes, and to embed the desired changes in operational routines. [35] The intent of the checklist is to enable individuals and teams to work together, be involved and lead to improved clinician engagement, translation of evidence-based innovation and cause practical change.

Table 3:

AUTHORS	CHECKLIST
Chinman, Imm and Wandersman (2004) [14]	Getting To Outcomes (GTO™).
Guldbrandsson (2008) [36] checklist	'From news to everyday use: The difficult art of implementation'.
US Department of Healthcare and Human services	Agency for Healthcare Research and Quality (AHQR). [17]
New South Wales Clinical Excellence Commission (CEC)	Enhancing Project Spread and Sustainability – A Companion to the 'Easy Guide to Clinical Practice Improvement'. [18]

Existing checklists and the PARTI framework

The use of checklists is becoming a valuable addition to change implementation models. We reviewed different questionnaires for implementation. [14,17-19,36,37] We included checklists shown in Table 3.

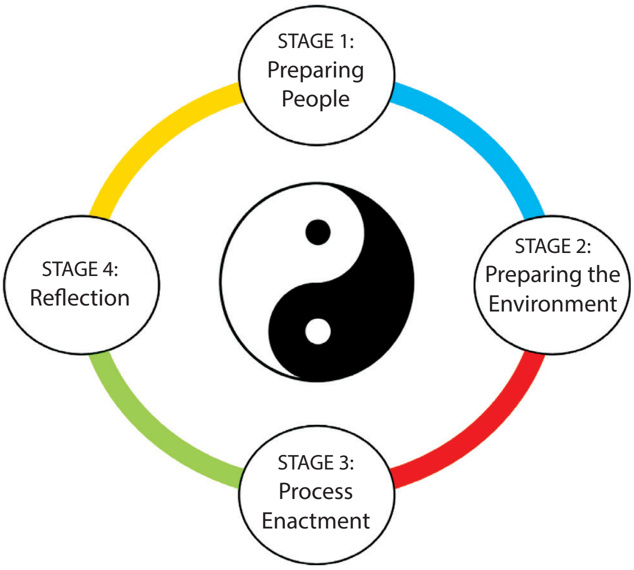
The end result was a checklist of questions that focuses those who are implementing innovations to the context and work at hand. In this way, there is an active process of implementation to facilitate the progression of implementation. While this checklist was more helpful to operationalise implementation, the authors identified that there was still no component that 'hooked in' practitioners, that is, there was no emotional element that would ensure active 'buy in' by practitioners into the process. Thus there was a need to include some introspective questions in order to ensure that practitioners reflected on what they did, and more importantly, 'why'.

Human behaviour is an area that is not well addressed in current implementation frameworks and as such draws attention to the importance of intrinsic volitions and sustained changed behaviour. Intrinsic volition includes those aspects related to personal motivation and wanting to change behaviour, and then motivations to sustain this change, trusting that the new behaviour is better and thus supporting the adoption of alternate behaviour(s). These include an emphasis on reflection of the risks of not changing behaviour when evidence is presented. Therefore our implementation framework was influenced also by psychologism.

Psychologism combines the study of psychology and philosophy or logic [38] and encompasses both the inferences people should make, and the conclusions they actually reach and act upon. We considered the personal, social and profession-based aspects of organisational change and included prompts for individual introspection about the need for change and the impacts of change for patients and clinicians.

The inclusion of these previously neglected factors, are proposed to instigate an increased commitment to change, clinician buy-in and encourage change fidelity. To maximise this impact, we developed a questionnaire, shown in Appendix 1, to encourage introspection at each stage of the change process, including questions about: need; readiness; relevance; and agreement for change. The aim of these reflective questions is to develop awareness that the combination of the risks of doing nothing and the potential for continued adverse events to act as a tipping point for all stakeholders to commit to change.

Figure 2: PARTI framework [adapted from 39, p.217]



In our proposed framework, we propose a four-stage process, each with a range of questions to encourage constructive introspection from individual, group and organisational membership perspectives. Each stage is linked in a circle, indicating the continuity of the model of change, which is never ending. Central to each is the interaction between positive and negative influences (Yin and Yang) creating a harmonious environment, in which change takes place, is adopted, implemented and evaluated. For this harmony to occur, introspection is needed. A discussion of each stage is now provided and the questionnaire with introspective questions that must be completed before beginning the next stage is provided in Appendix 1.

Stage one: Preparing people - stakeholder salience, champion identification, needs assessment and resource assessment.

This stage includes identifying one or more change champions along with those stakeholders with the highest salience, developing a shared vision, creating an environment of readiness for social interaction and exchange, and undertaking a resource and risk assessment. Some sample introspection questions in this stage and can include: 'Who in the organisation will 'lead the charge' for this project?' 'Who has the ability to effectively promote its value to others?'

Stage two: Preparing the environment for embedding changes using PAR – imagining the ideal state.

This stage initiates the social interaction and exchange environment that will support a PAR approach to engage key stakeholders in the process. This involves preparatory training and implementation and monitoring of the identified changes. Stakeholder tipping points are analysed in this stage and stakeholders are encouraged to undertake regular introspection periods to ensure actual actions are congruent with agreed goals. Actions can include understanding the current state, developing stakeholder goal congruence, a needs assessment and establishment of an implementation team with clearly defined specific roles. This leads to identification of opportunities for improvement to policies and procedures, structures, processes, access, support and training among others. A critical reference group is established to monitor (pre-empt problems and address any potential issues) and undertake concurrent evaluation of the changes (a supportive feedback mechanism).

Some sample introspection questions can include: 'Where are the data showing there are gaps between best practice and current care?' 'How are things done now?'

Stage three: Process enactment (ie doing it)

This stage includes monitoring (pre-empting problems and addressing any potential issues) and undertaking concurrent evaluation (supportive feedback mechanisms) as part of PAR. An example of introspection questions can be: 'Has there been evidence, or good reasons provided that the change will address staff concerns?'

Stage four – Reflection and assessing the new state.

This stage includes reflection on what has been done (considering, interpreting and documenting) and a reflection on lessons learnt. It looks at what problems still exist/have emerged and identifies whether these need addressing by returning to stage one, or whether an issue identified by the earlier needs assessment can now be addressed. This stage also includes prioritising (recognition that there are multiple possibilities and looking at what can/still needs to be changed) and assessing the new state of affairs (whether the new state is what you wanted to achieve and/or whether new problems have been generated). Some sample questions can include: 'What is working and what isn't?' 'Do changes to implementation plans need to be made?'

Discussion and conclusion

Unpredictable implementation fidelity and inadequate consideration of the motivations and behaviours to commit to change of individuals within groups and organisations are addressed through the specific guidance provided by the PARTI checklist. The development of the PARTI framework has been supported by a series of 'thought experiments' in which we tested the completeness and probability of success using a range of health innovation implementation experiences that have either been publicly reported or we have directly experienced. These include tele-health, patient journey re-design, developing new products for health services settings and continuous quality improvement program implementation.

The PARTI framework has been explicated and operationalised in the following stages: pre-implementation planning and creating the implementation environment, embedding processes, doing it, reflection and evaluation. The next stage in the research will be to switch from a rationalist, theoretical approach and to empirically test the usefulness of the framework [40] in order to see if it supports effective change in a range of high and low acuity health settings (e.g. aged care, home nursing support, hospital wards). Following that, comparisons of the efficacy of the PARTI framework and other frameworks developed to improve the dissemination and uptake of evidence-based practice would be performed.

This paper makes important contributions to the literature. First, the PARTI framework is novel in its extension of existing assessment tools by including operational constructs that are linked to theoretical frameworks, thereby enabling their practical application. Second, it introduces consistent reflective practices throughout the implementation lifecycle that encourage individuals to consider personal motivation and change behaviours. This in turn highlights the importance of identifying participants' tipping point and preparing them and the environment for proposed changes, where the tipping point represents the point at which an individual moves from inertia to motion. This includes finding their compelling rationale for change, supporting effective change and then embedding the changed state into individual, professional and organisational practices. In essence, the introspection questions will assist participants commit to the change. Further, and most importantly, clear guidance is provided to implementers of innovations by introducing a set of checklists, to ensure that what is being implemented is as close to that planned as possible – an important aspect often not considered in implementation research [41] and an aspect that inhibits change fidelity. This should allow those aiming to improve uptake of evidence into practice to be more likely to reach a successful outcome by considering a balanced approach of commitment (Ying) and fidelity (Yang) at every stage. Finally, PAR is being used as a method to operationalise the framework, as it facilitates the move from theory driving practice to practice driving theory, thus making it truly cyclical.

Consequently, this paper makes significant contributions to the literature on implementation frameworks. In doing so, it suggests that researchers need to consider the human element of translating research into practice. That is, while it is well known that evidence alone does not change practice, understanding what makes people commit to and enact change sustainably at an individualistic level may make implementing research into practice more successful in the future. This paper has focused on the individual response when implementing new practices. However, organisational routinisation of new practices also requires group and organisational reactions to the design and implementation of change. The real challenge for organisations is to capitalise on individual momentum and harness the energy to carry out organisational transitions. This is the objective of future work.

Competing interests

The authors declare that they have no competing interests.

References

1. WHO. Knowledge Translation on Ageing and Health: a framework for policy development 2012. Geneva: WHO; 2012.
2. IOM. Best care at lower cost: the path to continuously learning health care in America. Washington, DC: 2012.
3. Meyers DC, Durlak JA, Wandersman A. The Quality Implementation Framework: a synthesis of critical steps in the implementation process. Am J Community Psychol. 2012.
4. Graham ID, Tetroe J, Group KTR. Some theoretical underpinnings of knowledge translation. Academic Emergency Medicine. 2007;14:936-41.
5. Grimshaw J, Thomas R, MacLennan G, Fraser C, Ramsay C, Vale L, et al. Effectiveness and effici≠ency of guideline dissemination and implementation strategies. Health Technol Assess. 2004;8(6):iii-72.
6. Eastabrooks C. Guide to Knowledge Translation Theory. J Contin Educ Health Prof. 2006;26:25-36.
7. Brehaut JC, Eva KW. Building theories of knowledge translation interventions: use the entire menu of constructs. Implement Sci. 2012;7(114).
8. Michie S, Johnston M, Francis J, Hardeman W, Eccles M. From theory to intervention: mapping theoretically derived behavioural determinants to behaviour change techniques. Appl Psychol. 2008;57(4):660-80.
9. Cane J, O'Connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research. Implement Sci. 2012;7(37).
10. Huijg JM, Gebhardt WA, Crone MR, Dusseldorp E, Presseau J. Discriminant content validity of a theoretical domains framework questionnaire for use in implementation research. Implement Sci. 2014;9(11).
11. Wandersman A, Chien VH, Katz J. Toward an evidence-based system for innovation support for implementing innovations with quality: tools, training, technical assistance, and quality assurance/quality improvement. Am J Community Psychol. 2012;50:445-59.
12. Rogers EM. Diffusion of innovations. 5th ed. New York, NY: The Free Press; 2003.
13. Wadsworth Y. Building in research and evaluation: human inquiry for living systems. Sydney: Action Research Press, Hawthorn and Allen & Unwin; 2010.
14. Chinman M, Imm P, Wandersman A. Getting to outcomesTM 2004: promoting accountability through methods and tools for planning, implementation, and evaluation. . Santa Monica, CA: RAND Corporation; 2004.
15. French SD, Green SE, O'Connor DA, McKenzie JE, Francis JJ, Michie S, et al. Developing theory-informed behaviour change interventions to implement evidence into practice: a systematic approach using the Theoretical Domains Framework. Implement Sci. 2012;7(38).
16. Michie S, Johnston M, Abraham C, Lawton R, Parker D, Walker A. Making psychological theory useful for implementing evidence based practice: a consensus approach. Qual Saf Health Care. 2005;14(1):26-33.
17. AHQR. Will it work here? A decision maker's guide to adopting innovations. Rockville, MD: Services USDoHaH; 2008.
18. CEC. Enhancing project spread and sustainability – a companion to the 'Easy Guide to Clinical Practice Improvement'. Sydney: CEC. Sydney: Clinical Excellence Commission; 2008.
19. MassTAPP. Partnerships for Success II: Guidance Document. Massachusetts: MA Department of Public Health, Bureau of Substance Abuse Services; 2012.

20. Michie S, Abraham C. Identifying techniques that promote health behaviour change: Evidence based or evidence inspired? Psychology and Health. 2004;19:29-49.
21. Michie S, Ashford S, Sniehotta FF, Dombrowski SU, Bishop A, French DP. A refined taxonomy of behaviour change techniques to help people change their physical activity and healthy eating behaviours: The CALO-RE taxonomy. Psychol Health. 2011; 26(11):1479-98.
22. Michie S, Hyder N, Walia A, West R. Development of a taxonomy of behaviour change techniques used in individual behavioural support for smoking cessation. Addictive Behaviors. 2011; 36(4):315-9.
23. Kotter JP, Cohen DS. The Heart of Change: Real-life stories of how people change their organizations. Boston, Massachusetts: Harvard Business School Press; 2002.
24. Wallerstein N, Duran B. Community-based participatory research contributions to intervention research: the intersection of science and practice to improve health equity. Am J Public Health. 2010; 100(Supplement 1):S40-6.
25. Rusly FH, Corner JL, Sun P. Positioning change readiness in knowledge management research. Journal of Knowledge Management. 2012;16(2):329-55.
26. Layde P, Christiansen A, Peterson D, Guse C, Maurana C, Brandenburg T. A model to translate evidence-based interventions into community practice. Am J Public Health. 2012;102(4):617-24.
27. Institute of Medicine, Health CoUPMtIC. Improving health in the community: a role for performance monitoring. Washington DC: 1997.
28. VirginiaTech. Re-aim Blacksburg, Virginia2013 [updated 2013; cited 2013 14 June]. Available from: http://www.re-aim.hnfe.vt.edu/index.html.
29. Palmer D, Kramlich D. An introduction to the multi-system model of knowledge integration and translation (MKIT). Adv Nurs Sci. 2011;34(1):29-38.
30. Packard T. Organizational change: a conceptual framework to advance the evidence base. Journal of Human Behavior in the Social Environment. 2013;23(1):75-90.
31. Rycroft-Malone J, Seers K, Chandler J, Hawkes CA, Crichton N, Allen C, et al. The role of evidence, context, and facilitation in an implementation trial: implications for the development of the PARIHS framework. Implement Sci. 2013;8(28).
32. Rycroft-Malone J, Seers K, Crichton N, Chandler J, Hawkes CA, Allen C, et al. A pragmatic cluster randomised trial evaluating three implementation interventions. Implement Sci. 2012;7(80).
33. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implement Sci. 2009;4(50).
34. Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O. Diffusion of innovations in service organizations: systematic review and recommendations. Milbank Q. 2004;82(4):581-629.
35. Gawande A. The checklist manifesto : how to get things right. New York, New York Metropolitan Books; 2010.
36. Guldbrandsson K. From news to everyday use: the difficult art of implementation. Stockholm: Swedish National Institute of Public Health; 2008.
37. Albert D, Fortin R, Herrera C, Riley B, Hanning R, Lessio A. Strengthening chronic disease prevention programming: the toward evidence-informed practice (TEIP) program evidence tool. Preventing Chronic Disease. 2013;10:E87.
38. Perla RJ, Provost LP, Parry GJ. Seven propositions of the science of improvement: exploring foundations. Qual Manag Health Care. 2013;22(3):170-86.
39. Worley CG, Mohrman SA. Is change management obsolete? Organizational Dynamics. 2014;43(3):214-24.
40. Newton W. Rationalism and empiricism in modern medicine. Law and contemporary problems. 2001;64(4):299-316.
41. Keith RE, Hopp FP, Subramanian U, Wiitala W, Lowery JC. Fidelity of implementation: development and testing of a measure. Implement Sci. 2010;5(99).

Appendix 1

Implementation checklist

STAGE 1: **Pre-implementation planning**	• Is there an acknowledged need for change? • Who in the organisation will 'lead the charge' for this project? • Who has the ability to effectively promote its value to others? • Who has the respect of others and authority to make decisions? • Which stakeholders are recognised as holding all three salient attributes – power, legitimacy and urgency? • What does the organisation want to achieve? • What resources do we currently have? • Are there any known risks associated with the area to be changed? • Are we asking the right questions from the right people? **Introspective questions on commitment and fidelity:** • How will we get people to commit before moving onto next stage? • What is my responsibility to ensure sustainable health system? • Do I care about the overall health system and its sustainability? • What is my moral responsibility in terms of benevolence? And doing good for those in my care?
STAGE 2 **Creating the implementation environment and Embedding the processes, PAR**	• How are things done now? • What are the opportunities for improvement? • What are the resources needed to make the changes happen? • What data is available? • What else is needed? • Which issues have the available resources and capacity to be addressed? • Is there a known solution that would work here? • Are we ready? • Who will do what? • What is/are the priority/ies? • Where are the data showing there are gaps between best practice and current care? • What CAN be addressed now? • What resources are already available to address the identified needs? • Has there been evidence, or good reasons provided that the change will address staff concerns? • What are the opportunities for improvement? • What is the ideal state? **Introspective questions on commitment and fidelity: How will we get people to commit before moving onto next stage?** • What are your deeper hopes, values, purposes and intentions? • What could realise them? • What will the future look like if no changes are made now? • Is the risk of changing my behaviour greater than the risks associated with doing the same as I do now? • Will I be a winner or loser when adopting new ways of practising? • Do I trust the people I work with or for, to make genuinely positive change, or do I suspect work will be shifted my way?

Appendix 1 *continued*

STAGE 3 **Process enactment**	• Has there been evidence, or good reasons provided that the change will address staff concerns? • Are the outcomes sufficiently improved for the amount of work needed to make the changes? • Are we on the right track? • Are the patients satisfied? • Is it helping? Do you feel you are doing better work this way? • Are we doing what we set out to do? **Introspective questions on commitment and fidelity: How will we get people to commit before moving onto next stage?** • Can I give myself permission for the change to take place (passively)? • Can I support this change? Can I be a leader of this change (actively)? • Can I step forward to assist the implementation of change as quickly as possible?
STAGE 4 **Evaluation and reflection**	• What is working and what isn't? • Do changes to implementation plans need to be made? • Do changes to the innovation need to be made? • Is it helping? Do you feel you are doing better work this way? • What else is needed? • Have we achieved what we set out to achieve? If not, why not? • What do we now know that we did not know prior to this change initiative? • What does the new innovation make redundant? • Where else does change need to happen to make this work better? • Does any practice have to stop, to make it easier? • Is the innovation being implemented as originally planned? • Have you addressed the original identified need? • Have the original issues that needed to be addressed been improved? • Have new problems been identified? • How will we get people to commit before moving onto next stage (or innovation)? **Introspective questions on commitment and fidelity:** • Do I like seeing changes fail?(–I told you so…)? • Is it my personal preference to keep working harder and not make any changes? • What have I done to make this change successful? • What could I have done differently? What was my commitment to success? • How did my commitment to the change process affect others around me? How did I manage expectations? • Was I the best change champion I could have been? What will I do differently next time.

Employability Skills in Health Services Management: perceptions of recent graduates

D G Messum, L M Wilkes, D Jackson and K Peters

Abstract

Background: Employer skill requirements of graduates are monitored by Graduate Careers Australia, but health services management (HSM) specific employability skills (ES) perceived by graduates to be important on the job and their perceptions of skills they need to improve are not well reported. Academics need this feedback to improve course employment outcomes by helping current students identify and articulate appropriate competencies to potential employers. Also teaching of industry requirements can help improve job matching for employers.

Method: Recent graduates working in HSM in New South Wales, Australia were surveyed to rate ES for importance and rate their own skill levels on the same items. The gap between these two ratings was identified for 44 ES.

Results: ES important to recent graduates in rank order were: verbal communication skills, integrity and ethical conduct, time management, teamwork, priority setting, ability to work independently, organisational skills, written communication, being flexible and open minded and networking. Highest self-ratings were found for integrity and ethical conduct, ability to work independently, being flexible and open minded, tertiary qualifications, interpersonal skills, written communication skills, time management, life-long learning, priority setting and administration skills. Generally graduates rated their skills lower than their ratings of importance.

Conclusions: Recent graduates can provide valuable feedback to universities about ES required for HSM positions and identify their own skill gaps for development at work or through study. Generic skills rather than job-specific skills are what they rate as most important. Closer engagement of universities and employers is recommended especially through placements.

Abbreviations: ES – employability skills; GCA – Graduate Careers Australia; HEI – higher education institutions; HRM – human resource management; HSM – health services management; IPC – interpersonal and communication skills.

Key words: employability skills; generic skills; graduates; health managers; university.

Diana Glen Messum
Science and Health
University of Western Sydney
Penrith, New South Wales, Australia.

Lesley Marie Wilkes
Nursing and Midwifery
University of Western Sydney
Penrith, New South Wales, Australia.

Debra Jackson
Faculty of Health & Life Sciences
Oxford Brookes University
United Kingdom of Great Britain and Northern Ireland.

Kath Peters
School of Nursing and Midwifery
Campbelltown, New South Wales, Australia.

Correspondence:
d.messum@westernsydney.edu.au

Introduction

The aim of this study was to identify skills that recent graduates working in the field of health services management (HSM) in New South Wales Australia, perceive as important for their jobs and how they rate their own skill levels. What they find important may include technical or discipline specific skills, personal attributes and employability skills (ES). The Australian Commonwealth Department of Education Science and Training [1] has defined ES as:

> Skills required not only to gain employment, but also to progress within an enterprise so as to achieve one's potential and contribute successfully to enterprise strategic directions. Employability skills are also sometimes referred to as generic skills, capabilities or key competencies. (2002 p.143)

This definition was the preferred option because ES is the term used by industry. The term encompasses not only skills related to getting a job but also ongoing employment, understanding of which is useful not only in recruitment processes for employers, current graduates and undergraduates but also for work-based professional development. Findings can also be used to inform higher education curriculum development and help improve employment outcomes. However, it is acknowledged that ES to secure employment may be different to skills required to progress in an organisation, [2] and some skills may best be learnt on the job.

Generic ES seem more useful than job-specific skills [3] for coping with rapidly changing and complex work environments. The Australian Employability Skills Framework [4] acknowledged ES as skills and knowledge that enable employees to perform effectively in the workforce and apply technical or discipline specific skills. This report found that failure to recognise the context-dependent nature of ES, lack of explicit focus on ES in education, also measurement and assessment difficulties helped explain poor development of ES in graduates. One key intention of this paper is to make ES more visible and explicit for the field of HSM.

Employers' perceptions

Many studies have explored the views of employers about skills required on the job, but relatively few report on the views of recently employed graduates working in the field [5,6,7] and no studies specific to HSM were found in the literature. Graduate Careers Australia annually conducts large scale surveys, reporting 23.4% of Australian employers indicated they had difficulty sourcing, recruiting and retaining graduates. [8] Where vacancies are advertised may help explain recruitment difficulties. Vacancy advertisements compared poorly with hiring rates for employee referrals and university placements. [8] Expectations about work readiness and employer preferences for graduates who 'hit the ground running' have also been explored. [9,10] Typically generic ES have been found more important to employers rather than discipline specific skills or degree results. [11] The most important ES to employers has consistently emerged as communication skills, written and oral, but skill gaps have been noted. [12,13,14] Other reported skills gaps related to integrity, teamwork, problem solving, literacy, numeracy, critical analysis skills, software skills, planning, organising and self-management. [15]

There is limited research exploring ES requirements from employers in the health arena. Messum et al 2011 [16] found that the main essential requirements advertised for HSM were interpersonal skills, experience, tertiary qualifications, knowledge of the healthcare system, teamwork, conceptual and analytical skills, computer skills, financial skills and leadership. Important to senior health managers was integrity and ethical conduct, interpersonal skills, teamwork, being flexible and open-minded, written and verbal communication skills, self-awareness, collaborative and planning skills rather than technical or discipline-specific skills. Only two common items were revealed for the top ten essential skills advertised compared with the top ten ES required by senior health managers: interpersonal skills and teamwork. [17] Specifically ES gaps in recent graduates that they supervised were reported for teamwork, written skills, collaboration, negotiation, computing and software skills (specifically use of Excel), strategic thinking, ability to scan the environment and self-awareness. [17] This study also found that health managers wanted new graduates with good self-management skills who required minimal supervision, and were self-starters with a good work ethic.

Recent graduate perceptions

Although employers have consistently rated core ES levels lower than new graduate employees' self-ratings with the exception of information technology skills, [18] it has been argued that recent graduates are well placed to identify skills important in the real world, based on employment in the field and current insight into what is valuable. [19] They can reflect industry expectations, which can be useful for future students and HEI curriculum development. Although the contextual nature of ES has long been recognised [4] no recent studies from graduates focusing on HSM were found in the literature.

Engagement with the concept of employability may predict development of ES as students: if they cannot see the relevance or importance of specific ES they may be less inclined to learn them and/or demonstrate them to prospective employers. [20] For example international students who failed to recognise the importance of communication skills and 'questioning accepted wisdom' exhibited higher unemployment rates. [21] Generally graduates are increasingly aware they need additional skills and attributes for career success, that a degree is not enough. [22,23,24] They hold an instrumental view of ES: [7] to secure competitive advantage because a degree only confirmed the ability to be ready for further training.

ES identified by graduates as important include communication skills, teamwork, information technology, planning and organising also flexibility and adaptability, being hard working, showing commitment and dedication,

[14] consistent with employer requirements. However, these skills were not necessarily developed at university. Rather, placements were highly valued for development of teamwork, as was being given responsibility and collaborative learning enhanced critical thinking, problem solving, decision-making and raised ethical awareness. [7,18,21] Specifically, the workplace team focus was found very different to the university culture of individualised work. [21] Vocationally oriented programs, well connected to employers using assessments based on lectures, internships, written assignment and oral presentations, characterised better performing universities in terms of employment outcomes. [25] Interestingly use of multiple choice examinations negatively correlated with outcomes. [25]

Graduate perceptions of their own skill levels have been studied. [6,7,26] In a survey of 36 Australian universities shortly after course completion, most full-time employed bachelor degree graduates felt that they possessed high levels of skill for learning, teamwork, problem solving and communication. [27] However, for information technology skills and initiative/enterprise only 58.9% and 57.7% respectively rated their skills highly. Three years later, ES were reported as much improved, especially self-management, initiative/enterprise, planning and organising, skills they identified as more effectively developed on the job rather than at university. [27] Some differentiation of ES best developed on the job and/or at university is needed.

Purpose of this study

The broad aim of this study was to identify the views of recent graduates working in the field of HSM about skills they need at work. More specifically this research aimed to determine the following:

- Perceptions of skills most important for work, whether job specific or generic.
- Any 'importance-performance ' gaps [5] comparing importance ratings with self-ratings of skill levels, to reveal ES well developed or requiring further development.
- Where and how current employment was found.
- Best aspects of their HEI course and aspects for improvement as feedback for curriculum development.

This paper is the third stage of a doctoral triangulation study exploring ES for graduates working in HSM, undertaken with approval from the Human Research Ethics Committee University of Western Sydney, (number H9344, 9 July 2013). Stages one and two have already been published. [16,17]

Method

Survey instrument

The six-page survey included four Likert scales named interpersonal and communication skills (IPC), critical analysis skills, job-specific skills and self-management as per our previous publication. [17] Graduates rated items in each scale for importance and then rated their own skill level on a five-point scale, from no skills i.e. requiring training and development (rated zero) to excellent rated four. Each item was rated in turn for importance then skill level to promote understanding that comparisons were being made. Other questions covered current employment, sector, salary level, gender, type of work, how the job was found, and open-ended items asked about perceived gaps in skills and recommendations to inform future curriculum development.

Survey sample

The survey was emailed over a three-month period from February 2013, to 50 health service managers who had graduated within the last three years. Recent graduates were found through graduation lists for one large metropolitan university in New South Wales as former students of the bachelor's degree in HSM 2010-2012. Students currently enrolled into the Masters of Health Science (HSM) were also emailed and included graduates from a range of educational backgrounds. The limitations of such convenience sampling are noted in the discussion.

Analysis

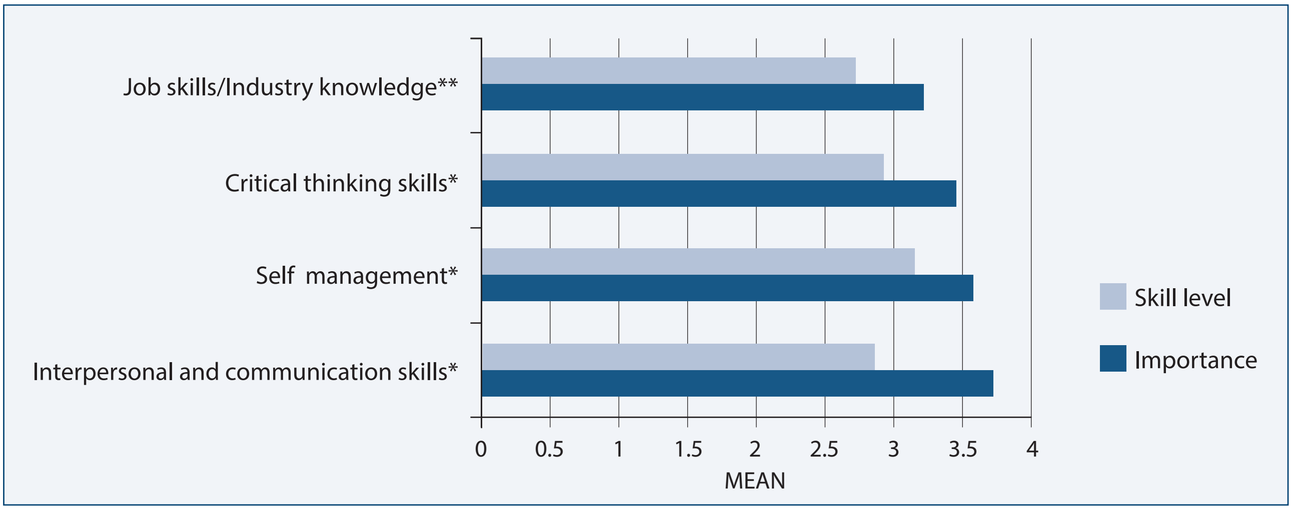
The scaled items were checked for internal consistency using Chronbach's alpha. For the total 44 items internal consistency was good with a Chronbach's alpha coefficient of 0.926. Furthermore, all sub-scales achieved a satisfactory Chronbach's alpha over .7, (ranging from .822 to .915), suggesting good internal consistency, that they were measuring the same underlying construct. Other analysis included paired samples t-tests for comparison of importance and self-rated skills with p set at 0.05, two tailed test for an exploratory study.

Results

Respondents

A total of 42 responded, 15 males and 27 females, a response rate of 84%. Twenty had completed an undergraduate degree from one metropolitan university, 20 from a variety of universities across New South Wales and two from overseas. Nearly half had worked in their current position only a year, eight less than a year, another eight up to two years, and five for over three years. (Some had worked in that job prior to

Figure1: Overall rating of each ES scale by recent graduates (n=42)



*p< 0.001, ** p<0.01

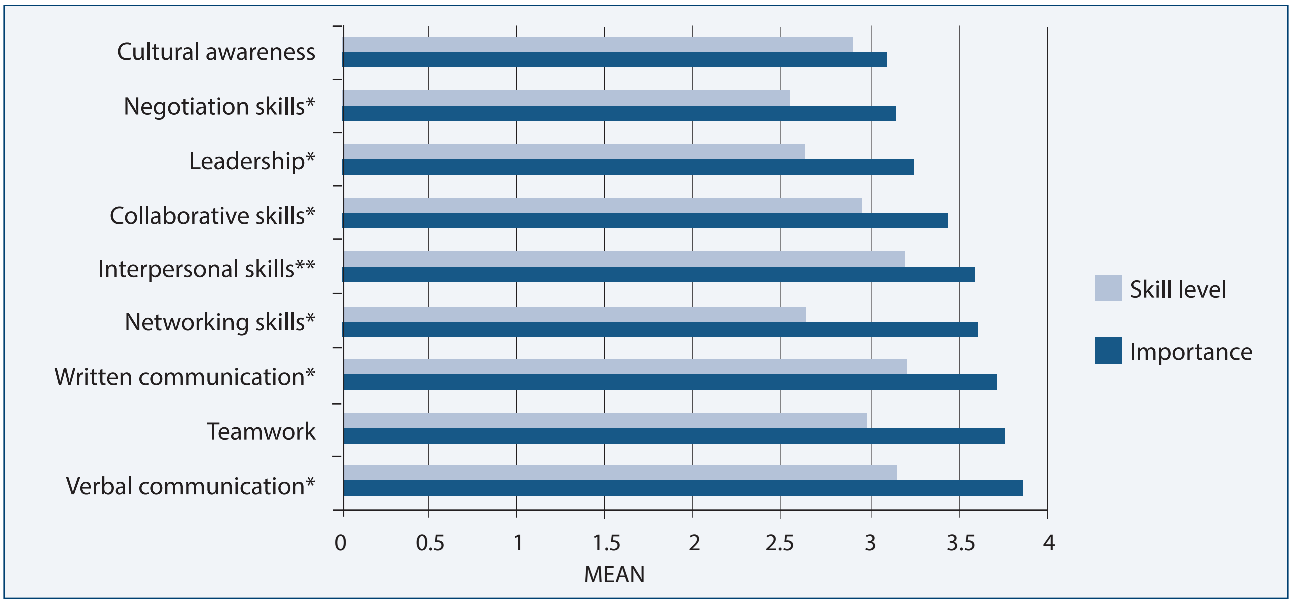
graduation, studying part-time.) The majority (88%) worked fulltime, but only four held a permanent position.

Over one third were currently engaged in part-time postgraduate study, in a ratio of two females to one male. Six worked as quality managers, four in general management roles, seven as project officers, and the others in support roles, eg personal assistants to senior staff. Three quarters (32) worked for state government, three for local government, six worked for not for profit organisations and one worked in the private sector. Nearly half (45%) earned in Australian dollars the salary range of $45-54999, 31% $55-64999, 19% over $65000 and only four under $45000, (working part-time), compared with the median new Australian graduate annual salary of $52000. [28]

Job search strategies

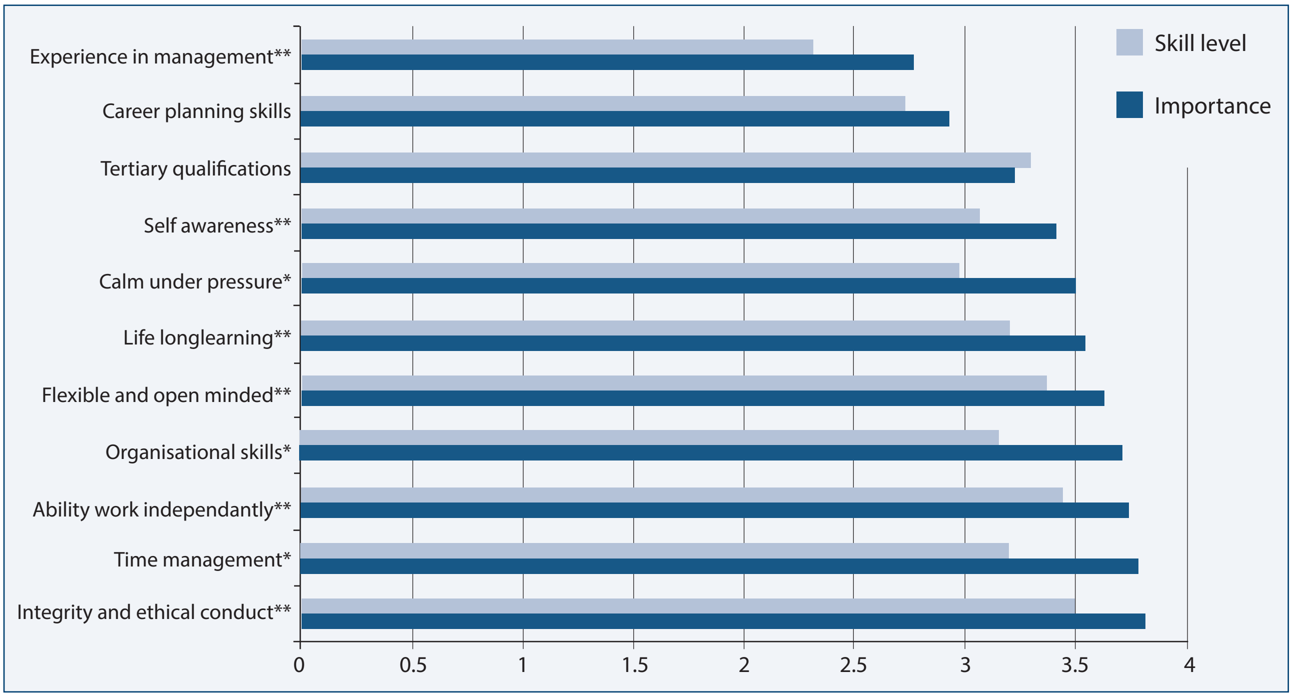
The job search strategies that successfully secured recent graduates employment in HSM included finding out about the job from a university lecturer (29.3%), advertisement on the internet 22%, family/friends and university careers services both 9.8%, work contacts or 'other' both 17%, and print media only 7.3%. Under 'other' two mentioned employer web sites which equated to less than 5%. None found employment through careers fairs or employment agencies. Only three used more than one option.

Figure 2: Importance of and self-rating of IPC (n=42)



*p< 0.001, ** p<0.01

Figure 3: Importance of and self-rating of self-management (n=42)



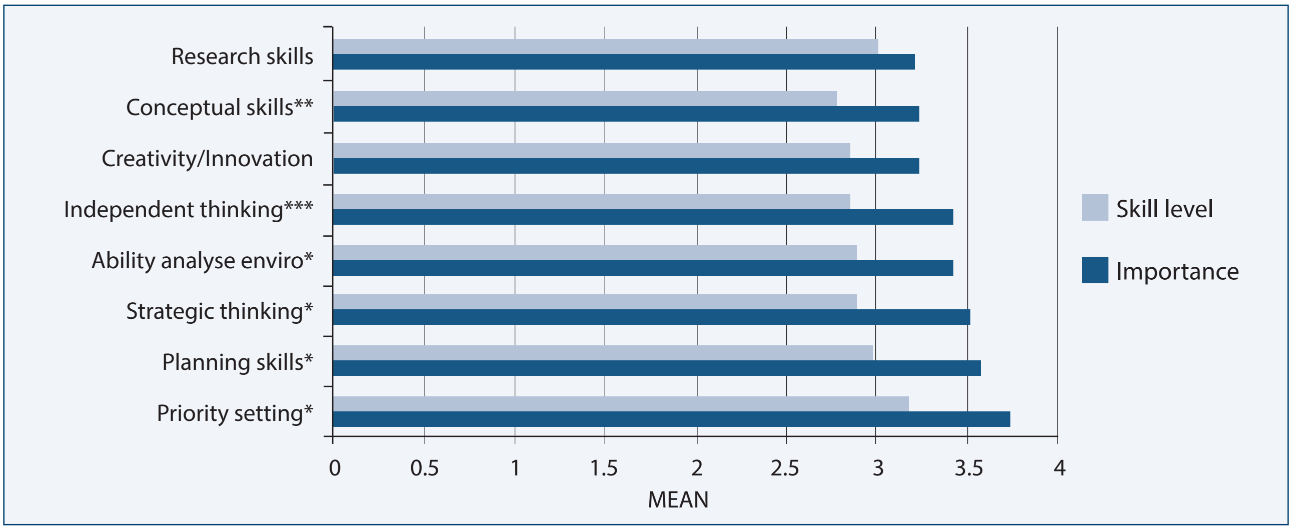
* p< 0.001, ** p<0.01, *** p< 0.05

Rating of employability skills

For each of the four scales, a total score was recorded by participants (n=42), and comparison of mean scores for importance (the lower bar) of ES and self-rating by recent graduates (the upper bar) are depicted in Figure 1. This shows that IPC, self-management and critical thinking were the most important ES according to recent graduates. Job skills and industry knowledge were less important. Self-rating of skills achieved significantly lower mean scores than importance ratings on each sub-scale. The biggest gap between rating of importance and self-ratings was for IPC, then critical thinking, job skills and self-management skills.

Each scale will now be discussed in turn. For IPC (Figure 2) the most important skills for recent graduates were verbal communications skills, team working, written skills and networking. Leadership and negotiation skills were rated as least important. For all items on this scale except cultural awareness, graduates' ratings of importance were significantly higher than self-ratings. Self-rating was lowest

Figure 4: Importance of and self-rating of critical thinking (n=42)



* p< 0.001, ** p<0.01, *** p< 0.05

for negotiating skills, leadership and networking, highest for interpersonal, written and verbal skills. The biggest skill gaps emerged for networking and teamwork.

In the self-management scale shown in Figure 3, the most important ES emerged as integrity and ethical conduct. After this, time management, the ability to work independently, organisational skills and being flexible and open minded were rated highly important with mean scores over 3.5. For all items self-rating mean scores were significantly lower than importance ratings except for tertiary qualifications and career planning. For career planning and tertiary qualifications no perceived skill gap was found. The biggest skill gaps emerged for being calm under pressure, time management and organisational skills.

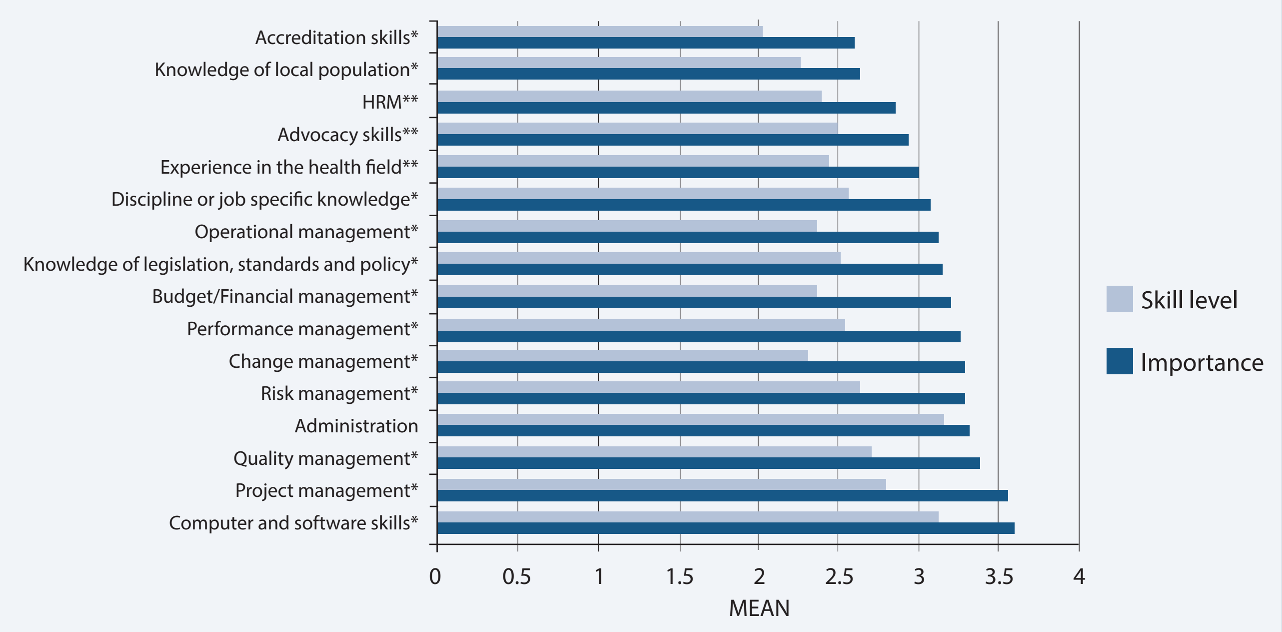
For critical thinking skills the most important aspects for recent graduates (Figure 4) were priority setting, planning skills and strategic thinking, with mean scores of 3.5 or more. For all items except research skills and creativity and innovation, the differences between graduates' rating of importance were significantly higher than self-ratings. The biggest skill gaps emerged for planning skills and priority setting.

Figure 5 shows the most important job skills/industry knowledge items for recent graduates as computer and software skills and project management with mean scores over 3.5. For all items except administration, graduates' rating of importance was significantly higher than self-ratings. The lowest self-ratings were given to knowledge of the local population, operational management, budget/financial skills and change management. The highest self-ratings resulted for administration, computer and software skills. The biggest skill gap emerged for change management, project management and performance management.

Graduates were asked how well they felt university prepared them for the workplace. One stated poorly, three were unsure, 35 (83.3%) said well and three felt university prepared them very well for their job. The most common response to an open ended question asking which aspects of higher education contributed most to skill development was placements (n=15), for industry exposure, to gain understanding and experience of the health system, how it works and health terminology. This was followed by development of writing skills from 12 respondents, specifically report writing and data analysis (four each). Supportive lecturers with health system knowledge and relevant field experience, who for example kept up to date with developments in the work environment, and offered 'relevant and authentic assessments' that prepared them for the world of work, was mentioned by six. Working in groups/teams was also mentioned by six.

Aspects that needed improvement included longer placements (n=11); greater emphasis on report writing and data analysis, grant applications, briefs, business cases, and critical analysis (n=6); development of computing skills specifically use of Excel and exposure to health data systems, more financial management content, group and teamwork

Figure 5 Job skills and industry knowledge importance and self-rated skill levels



* p< 0.001, ** p<0.01

skill development, teaching of project management skills, and how to apply for jobs, (four responses each). Conflict resolution and managing people were also listed as needed by three graduates. The most common theme that emerged as a skill gap when commencing work in health management was lack of understanding and knowledge of the health system (n=11). None of these respondents held a health related undergraduate degree. Knowledge of health software and data bases (n=10) was the second most common response and in equal third place, writing skills, financial management and project management (four respondents each).

Discussion

Job search strategies of new managers in this study did not match the main ways employers advertise graduate vacancies in Australia: [4] none specified organisational websites heavily used by employers, mainly finding current positions through a university lecturer or internet employment sites. Also graduates felt that work experience placements gave them an advantage by helping develop ES, consistent with the literature. [6,7] These findings suggest that engagement of universities and employers could be mutually beneficial to improve job matching.

Undertaking post-graduate study was also seen as instrumental in progressing careers. Just over one third of survey respondents in comparison with the Australian average of 20%, [4] were enrolled in post-graduate study, but this rate is lower than the United Kingdom rate of 60%. [15] The low rate of permanent employment of respondents may serve as an incentive to develop skills through further study.

To further improve job matching, graduates views on the important ES that they need on the job revealed that IPC were the most important for new health managers, consistent with findings for all graduates from GCA [27] and our earlier study of health managers. [17] The ten most important individual ES for study participants, in rank order, emerged as verbal communication skills, integrity and ethical conduct, time management, teamwork, priority setting, ability to work independently, organisational skills, written communication skills, being flexible and open minded and networking. All of these would be thought of as generic rather than discipline-specific skills, [8,16] transferable to a variety of jobs. This well matched their employers' views. [17] The least important ES in this study were items in the job-specific scale that could be learnt on the job.

Recent graduates working in HSM consistently rated their own ES lower than the importance ratings for the same items and were able to identify skill gaps, consistent with previous findings. [11] The biggest gaps were for generic skills of networking, teamwork, planning and priority setting, and job specific skills in change management, budget/financial management, project management and performance management. Some of these can be taught at university and some on the job. Specific gaps confirmed in an open ended question included understanding of the health system, health terminology, report writing, computer skills, health-specific software and using Excel, managing people, business planning and writing grant applications. These are skills that higher education can address best in collaboration with the health industry. The way university prepares graduates for industry can also be informed by the finding that respondents identifying the need for longer placements, more practical emphasis in assessments, written assignments rather than knowledge quizzes, group project work, and greater input from industry. These findings are also consistent with the literature. [7,18,21,28]

Implications of the study

Ratings of importance and self-rated ES of recent graduates working in HSM point to specific gaps that universities can use to inform curriculum development and/or employers can address in ongoing professional development. Closer partnerships between universities and employers through employment placements can facilitate development of ES, improve job matching and HEI employment outcomes. How graduates find employment also may help explain problems experienced by employers finding enough suitable graduate applicants to employ.

Further research

Limitations of the study are that results are from new health managers in one state of Australia only. The small convenience sample limits generality of the findings and a larger replication study is warranted. Furthermore, a larger sample size would permit factor analysis to validate the scales used. Comparison of graduates' views with other stakeholders such as current students and employers would also be worthwhile, and research to confirm actual skills levels. It is also not certain that ES have the same meaning for different stakeholders eg priority setting may be seen as a self-management skill rather than a critical thinking skill by recent graduates.

Conclusions

Paying attention to the views of recent graduates working in the field can be useful to inform curriculum development. They rated generic ES as more important than job-specific skills and significant gaps were revealed. Rating of importance of ES for the HSM field is generally higher than graduates rating of their own skills with few exceptions, which revealed ES gaps. This new evidence about those skill gaps may stimulate academic discussion about curriculum development for HSM. Academics can also draw student attention to the ES requirements of employers and what recent graduates believe to be important in their jobs to foster engagement of students with learning materials. Furthermore, if curriculum is informed by discipline specific information, it may help improve employment outcomes. The need for partnerships of university with industry was confirmed because placements were found the best aspect of their course for ES development. However, resourcing, supervision, and greater academic engagement may be required to deliver authentic experiences supported by ES-based assessment.

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Competing interests

The authors declare that they have no competing interests.

References

1. Department of Education, Science and Training (DEST). Employability skills for the future. A report by the Australian Chamber of Commerce and Industry and the Business Council of Australia for DEST. Canberra: DEST; 2002.
2. Semeijn J, Veldon R, Heijke H, Vlueten C, Boshuizen A. Competence indicators in academic education and early labour market success of graduates in health sciences. J Educ and Work. 2006:19(4): 383-413.
3. Liang Z, Short SD, Brown CR. Senior health managers in the new era: changing roles and competencies in the 1990s and the early 21st century. J Health Admin Ed. 2006; Summer:81-301.
4. Department of Education, Employment and Workplace Relations. Stage 1. Final Report Employability skills framework. Ithaca Group; 2012.
5. Oliver B, Whelan B, Hunt L, Hammer S. Accounting graduates and the capabilities that count: perceptions of graduates, employers and accounting academics in four Australian universities. J Teaching and Learning for Graduate Employability. 2011;2(1);2-21.
6. Gedye S, Fender E, Chalkey B, Students undergraduate expectations and postgraduate experiences of the value of a degree. J Geog Higher Ed. 2004;28(3);381-96.
7. Crebert G, Bates M, Bell B, Patrick C, Cragnolini V. Developing generic skills at university, during work placements and in employment: graduates' perceptions. Higher Ed Res and Dev. 2004; 23(2):147-64.
8. Graduate Careers Australia (GCA). The Report of the Graduate Outlook Survey: Employers' Perspectives on Graduate Recruitment. 2015. p.8. Available from: http://www.graduatecareers.com.au/research/surveys/graduateoutlooksurvey/
9. Ridoutt L, Selby Smith C, Hummel K, Cheang C. What value do Australian employers give to qualifications? Available from: http://www.ncver.edu.au/publications/1553
10. Oliver B, Hunt L, Jones, S, Pearce A, Hammer S, Jones S, Whelan B. The graduate employability indicators: capturing broader stakeholder perspectives on the achievement and importance of employability attributes. Proceedings of the Australian Quality Forum Quality in Uncertain Times. Gold Coast; 2010:89-95.
11. CBI. Changing the Pace. 2013. Available from: http://www.cbi.org.uk/media/2119176/education_and_skills_survey_2013.pdf
12. Archer W, Davison J. Graduate employability: what do employers need and want? The Council for Industry and Higher Education; 2008. Available from: http:/www.cihe-uk.com
13. Hinchliffe GW, Jolly A. Graduate identity and employability. BERJ. 2014.DOI: 10.1080/01411926.2010.482200
14. Tymon A. The student perspective on employability. Studies in Higher Ed. 2011.doi10.1080/03075079.2011.604408
15. Commission for Employment and Skills. National Employers Survey 2013: UK Results. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/327492/evidence-report-81-ukces-employer-skills-survey-13-full-report-final.pdf
16. Messum D, Wilkes L, Jackson D. Employability skills: essential requirements in health manager vacancy advertisements. A Pac J Health Manag. 2011;6:22-28.
17. Messum D, Wilkes L, Jackson D. What employability skills are required of new health managers? A Pac J Health Manag. 2015; 10(1):28-35.
18. Ferns S. Graduate employability: teaching staff, employer and graduate perceptions. In Proceedings of the Australian Collaborative Education Network National Conference. Springvale; 2012. p.77-87. Available from: http://hdl.voced.edu.au/10707/259614.
19. Ainsworth M, Motley C. The value of management education: views of graduates on the benefits of doing a MBA. Higher Ed. 1995;30(2);175-187.
20. The Dearing Report. Higher Education in the Learning Society 1997: Main report of the National Committee of Inquiry into Higher Education. 1997. Available from: http://www.educationengland.org.uk/documents/dearing1997/dearing1997.html
21. Kennely M, Jackling B. the acquisition of generic skills of culturally diverse student cohorts. Accounting Ed: An Int J. 2011;20(6):606-23.
22. Moreau MP, Leathwood C. Balancing paid work and studies: working (class) students in higher education. Studies in Higher Ed. 2006;31(1):23-42.
23. Tomlinson M. The degree is not enough: students perceptions of the role of HE credentials for graduate work and employability. Brit J Soc Ed. 2008;29(1):49-61.
24. Brooks R, Everett G. the predominance of work-based training in young gradates learning. J Ed and Work. 2008;21(1):61-73.
25. Storen LA, Aamodt PO. The quality of higher education and employability of graduates. Quality in Higher Ed. 2010;16(3); 207-313.
26. Wickramasinghe V, Perera L. Graduates', university lecturers' and employers' perceptions towards employability. Education and Training. 2010;52(3):236-244.
27. Graduate Careers Australia (GCA). The Report of the Graduate Outlook Survey: Employers' Perspectives on Graduate Recruitment. 2013. Available from: http://www.graduatecareers.com.au/wp-content/uploads/2014/03/Graduate_Outlook_2013.pdf
28. Graduate Careers Australia. Where grads go. 2015. Available from: http://www.graduatecareers.com.au/wp-content/uploads/2015/05/GradsGo2015.pdf
29. Wilton N. The impact of work placements on skill development and labour market outcomes for business and management graduates. Studies in Higher E. 2012;37(5):603-620.

RESEARCH ARTICLE

The Importance of the Physical Environment for Child and Adolescent Mental Health Services

S L Rogers, S J Edwards, P Hudman and R Perera

Abstract

Objective: This study examined the relationships between appraisals of the physical environment with the subjective experience of consumers, and work satisfaction of clinicians, in Child and Adolescent Mental Health Services (CAMHS).

Design, setting, and outcome measures: A survey of clinicians, parent/guardians, and child/adolescents was conducted across eight community CAMHS in Western Australia. Respondents evaluated the waiting room and therapy rooms on a number of environmental attributes, and factor analysis was carried out to confirm that these ratings loaded on an overall appraisal of the physical environment measure. This measure was then correlated with self-reported subjective experience of consumers, and overall work satisfaction of staff members.

Results: Clinicians were found to be much more critical of the physical environment compared with consumers. Moderate associations were found between appraisal of the physical environment and subjective experience of consumers. A strong positive association was found between clinician appraisal of the physical environment and overall work satisfaction.

Conclusions: The present study adds to the limited existing research arguing for the important role that the physical environment can have upon both consumer and staff experience in mental health settings. The present study provides empirical evidence to justify steps being taken to enhance the physical environment in mental health clinics. The inter-relationship between physical environment attributes suggests there is potential for managers to improve the overall perception of clinic space via relatively small actions (e.g., adding a nice piece of artwork).

Abbreviations: CAMHS – Child and Adolescent Mental Health Services.

Key words: mental health; physical environment; consumer satisfaction; job satisfaction; child and adolescent mental health; health services.

Shane L Rogers
Psychology and Social Science
Edith Cowan University
Perth, Western Australia, Australia.

Stephen J Edwards
Child and Adolescent Mental Health Services
Western Australia Health Department
Perth, Western Australia, Australia.

Paul Hudman
Child and Adolescent Mental Health Services
Western Australia Health Department
Perth, Western Australia, Australia.

Rebecca Perera
Psychology and Social Science
Edith Cowan University
Perth, Western Australia, Australia.

Correspondence:
shane.rogers@ecu.edu.au

Introduction

A broad research literature exists investigating how the therapeutic alliance between a therapist and client is influenced by therapist techniques, and also the personal characteristics of therapists and clients. [1] However the impact the physical environment has upon therapeutic process and outcome lacks the same level of understanding. [2-4] The physical environment has been shown to have an impact upon health and well-being in office workplaces, [5] and hospital workplaces. [6,7] However a recent review of the literature revealed that research investigating the impact of the physical environment in mental health services is lacking, and especially for community mental health services. [8] Research investigating the impact of the physical environment has the potential to uncover ways that mental health services can improve service quality. This can in turn facilitate the speed of treatment, and reduce associated costs. The present study examines the relationship between perceptions of the physical environment in child and adolescent mental health services (CAMHS), with self-reported client emotional experience, and clinician work satisfaction.

Physical environment in the clinic – the waiting room, and therapy rooms

The waiting room is a very important space for a health clinic. On the first visit to the facility clients typically must walk through the waiting room to approach the administration staff, and then spend some time waiting before being seen by a health practitioner. Therefore the waiting room space has an important influence upon the formation of a first impression of the facility. [9,10] In the context of mental health, this is an especially important issue. An initial negative first impression can place the therapy process on the back foot before it has started by reflecting poorly upon the therapist, and therefore unnecessarily increase the difficulty of establishing therapeutic rapport. [11,12]

Research also highlights the importance of the physical environment during counselling sessions in the therapy space. [2] A classic study by Chaikin, Derlega, and Miller (1976) found that in a simulated therapy session university students were more likely to engage in more self-disclosure in a room made to be perceived as soft (comfortable seating, softer lighting via lamps, rug on the floor, framed pictures on walls, and various other accessories) versus hard (brown asphalt tile floor, plain walls, overhead fluorescent lighting, and uncomfortable seating). In a similar study, Miwa and Hanyu (2006) found that dim lighting produced more favourable reported feelings of relaxation and impressions of the interviewer, and more self-disclosure, compared to bright lighting. Backhaus (2008) examined preferences for different environmental aspects of therapy rooms and found that soft and natural lighting was preferred over bright lighting. Additionally, both therapists and clients reported that a sense of privacy, minimal transmission of sound, comfortable furnishings, artwork, plants, magazines/books, a clock, and personal memorabilia were all preferable aspects for a therapy room. Devlin and colleagues conducted a series of studies that gave American university students, [13] university students from Turkey and Vietnam [14] and American therapists [15] a set of 30 photographs of different therapy rooms. They reported that across all samples the evaluations (comfort, quality of care, and impressions of therapist) were more positive for softer, and more orderly rooms. Unfortunately no prior research has focused upon a child/adolescent mental health setting.

In the Australian context, the importance of the physical environment has been implicitly recognised by the growing headspace (www.headspace.org.au/) initiative of the National Youth Mental Health Foundation. [16,17] This initiative provides an alternative mental health service for 12-25 year olds. One of the primary aims of this initiative is to increase youth participation with mental health services by providing a more 'youth friendly' service. [16] The service website states that 'Centres are built and designed with input from young people so they don't have the same look or feel as other clinical services.' (see: www.headspace.org.au/about-us/). The service has enjoyed rapidly increasing popularity since inception in 2007, and is projected to reach 100 centres by 2016. [17] The speed of growth has meant evaluation research has not kept pace with the expansion of the service, [18] although see recent evaluative work by Simmons et al [19] and Rickwood et al. [20] The present study provides an assessment of an implicit assumption that has guided the implementation of the headspace initiative: that an association will exist between client appraisal of the physical environment and client emotional experience within that environment.

The relationship between the physical environment and clinician job satisfaction

There is a large research corpus finding a relationship between work satisfaction and the appraisal of the physical work environment across a wide range of office settings, [21,22] and that the physical office setting can have implications for the mental and physical health of employees. [5,23] However the relationship between appraisal of the physical environment and overall work satisfaction has not been examined in the context of child mental health services. Even for mental health services in general, the physical environment has been paid little attention by researchers. [3] One study conducted in the 1970s reported that when a sample of clinical staff relocated to a new and improved facility, their satisfaction with their physical environment improved with an associated improvement in their overall work satisfaction. [24] Research shows that mental health workers are at an elevated risk of burnout due to the demanding nature of working in constant contact with individuals experiencing emotional difficulties. [25,26] Therefore, investigating ways that clinician job stress may be alleviated is a valuable endeavour in order to improve service quality and reduce staff turnover. Investigating the influence of the physical environment upon clinician job satisfaction has potential to reveal cost-effective strategies for improvement.

The present study

The present study seeks to add to the research literature by examining the relationship between appraisal of the physical environment and outcome measures such as client self-reported emotional experience and clinician self-reported general work satisfaction, in the context of child/adolescent mental health services. Some environmental factors can be considered to be indoor environmental attributes (comfort, safety, space, privacy, lighting and noise), and others considered interior design attributes (toys/books, artwork, and plants) as suggested by Rashid and Zimring. [7] Prior research has revealed that participant appraisal of different environmental attributes tends to be highly inter-related due to a halo effect. [27] For example, better lighting may contribute to an increased sense of space and comfort in the environment, whilst a poor piece of artwork may detract from how other environmental aspects are perceived, and so on. Therefore in the present study it was expected that ratings of the physical environment would be highly inter-related and could be combined into a single overall appraisal of the physical environment measure. Based on prior research that indicates the physical environment can have an influence on the experience of clients, it was expected that the client's overall appraisal of physical environment would be associated with the client's self-rated emotional experience. It was also expected that the clinician overall appraisal of the physical environment would be positively associated with their level of work satisfaction.

Method – participants

The sample consisted of 59 clinical staff employed by CAMHS (69% female), 85 parents/guardians (87% female), and 79 children/adolescents (70% female) surveyed across eight government-funded community clinics in the metropolitan area of Western Australia. For the child/adolescent group the distribution of age was: younger than 8 years (1%), 9-12 years (24%), 13-16 years (62%), and 17-20 years (13%). The length of experience with the clinic was: a few weeks (6%), a couple of months (28%), about six months (14%), about a year (25%), more than a year (22%), and no response to this question (5%). The length of experience with the clinic for the parents/guardians was: a few weeks (6%), a couple of months (22%), about six months (14%), about a year (21%), more than a year (32%), and no response to this question (5%). The length of experience working in the mental health industry for the clinician sample was: 2-5 years (14%), 6-10 years (15%), and more than 10 years (71%). Age information for the clinicians and parent/guardians was not recorded. This research received ethics approval from the West Australian Health Department, audit number – 588QP.

Method – procedure

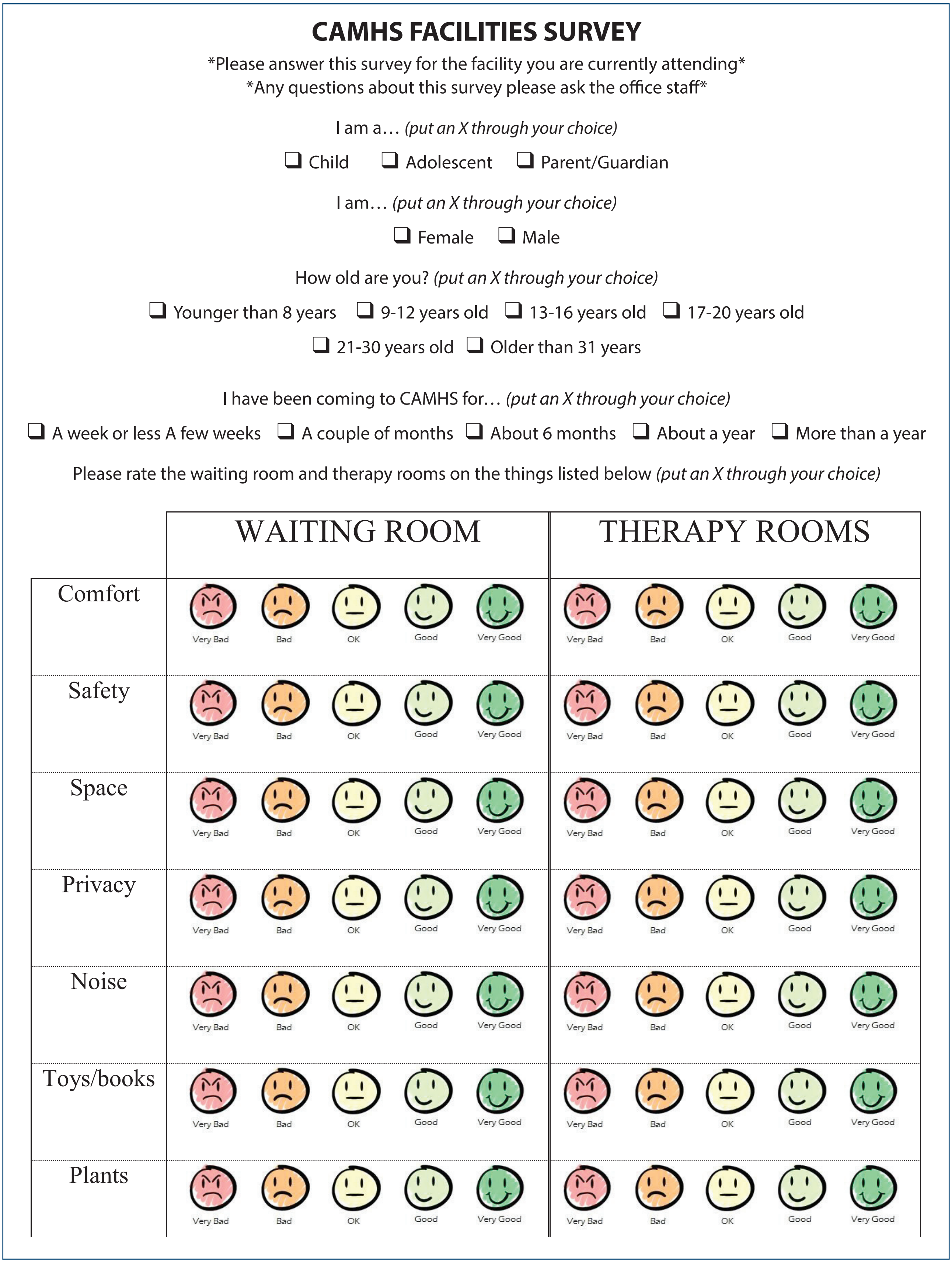
For clients (parents/guardians and child/adolescents) surveys were left in the waiting room and could be returned to an anonymous survey box in the clinic waiting room. The data collection phase of the project lasted for approximately three months, therefore responses were obtained from clients that varied widely on their stage of treatment. Clients were asked to rate a number of physical environment attributes (safety, comfort, space, privacy, lighting, noise, toys/books, artwork, and plants) separately for both the waiting room and the therapy rooms on a scale: Very bad, Bad, OK, Good, Very Good. Clients were also asked to rate how often they typically felt four different emotions (afraid, uncomfortable, bored, calm) separately for both the waiting room and therapy rooms on a scale: Never, Sometimes, Often, Always. An open-ended text box was included at the end of the survey for clients to provide any comments they might have about the clinic environment. The survey instrument is provided in Figure 1 below. Note that smiley faces were used as part of the response scales in order to make the survey more colourful and engaging to foster participation.

Clinicians were surveyed by the first author of this paper attending staff meetings at clinics. Prior to attendance, service managers of the clinics were emailed to obtain their consent for attendance. Clinicians were asked to provide ratings of different attributes for the waiting room and therapy rooms in the same way as the clients, however smiley faces were not used on their survey version. Note that clinicians were asked to provide their own personal perception of the environment, not their estimate of client perceptions.

Additionally, clinicians were also asked to provide a response to the statement 'Working at CAMHS I feel satisfied with working conditions' on a scale: Not at all, Somewhat, Moderately, Very and Extremely. There were a number of other questions on the clinician survey that are beyond the scope of this present study and are not reported here.

Ratings for different environmental attributes were obtained from all participants with the aim of combining ratings into an overall appraisal score to be correlated with client emotional experience of the clinic, and clinician job satisfaction. Additionally, client and clinician perceptions could be contrasted.

Figure 1: The survey used for child/adolescent and parent/guardian participants. Note that the age question was only able to distinguish between different ages for the child/adolescents.



CAMHS FACILITIES SURVEY

Please answer this survey for the facility you are currently attending
Any questions about this survey please ask the office staff

I am a… *(put an X through your choice)*

☐ Child ☐ Adolescent ☐ Parent/Guardian

I am… *(put an X through your choice)*

☐ Female ☐ Male

How old are you? *(put an X through your choice)*

☐ Younger than 8 years ☐ 9-12 years old ☐ 13-16 years old ☐ 17-20 years old
☐ 21-30 years old ☐ Older than 31 years

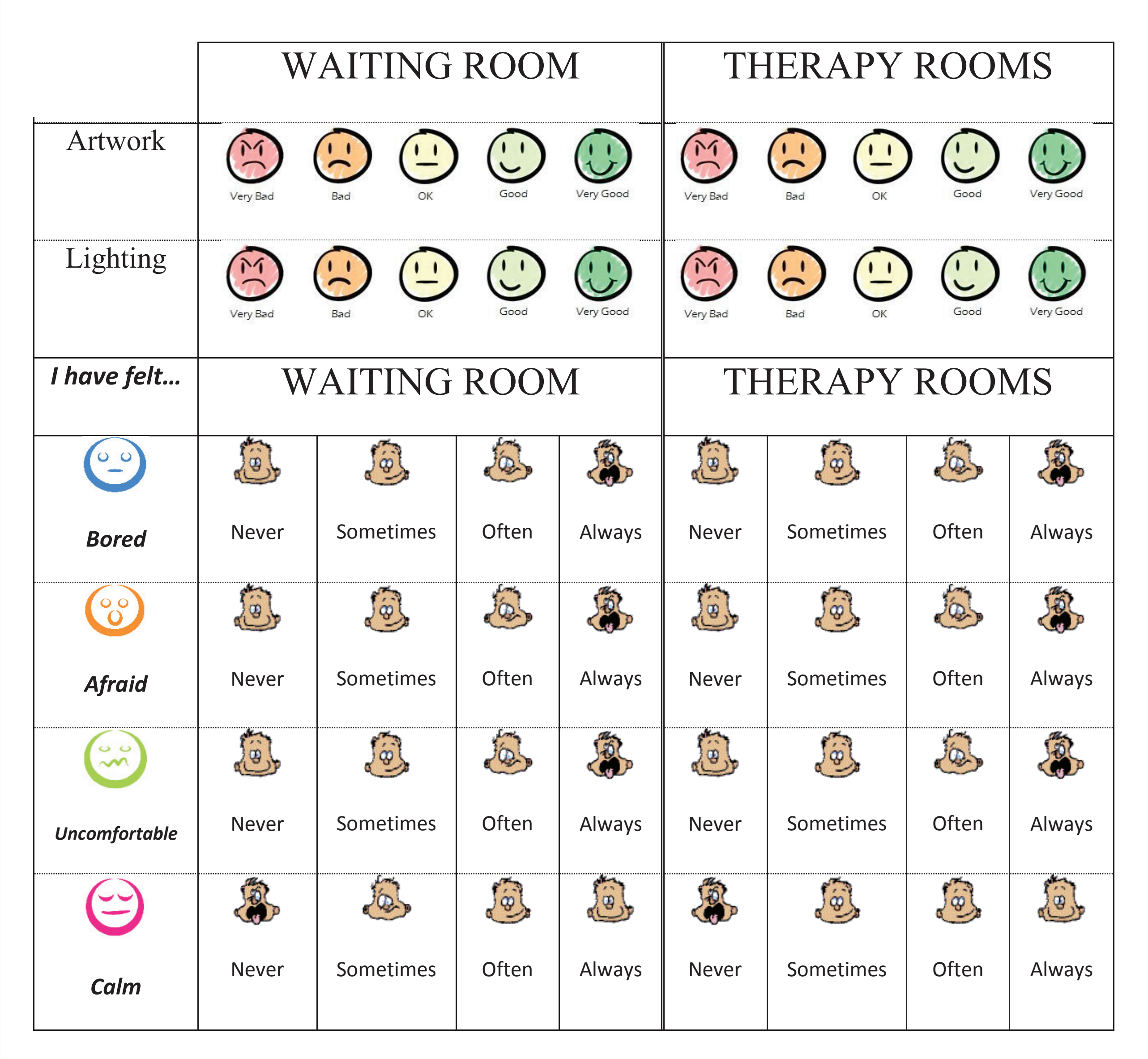
I have been coming to CAMHS for… *(put an X through your choice)*

☐ A week or less A few weeks ☐ A couple of months ☐ About 6 months ☐ About a year ☐ More than a year

Please rate the waiting room and therapy rooms on the things listed below *(put an X through your choice)*

	WAITING ROOM					THERAPY ROOMS				
Comfort	Very Bad	Bad	OK	Good	Very Good	Very Bad	Bad	OK	Good	Very Good
Safety	Very Bad	Bad	OK	Good	Very Good	Very Bad	Bad	OK	Good	Very Good
Space	Very Bad	Bad	OK	Good	Very Good	Very Bad	Bad	OK	Good	Very Good
Privacy	Very Bad	Bad	OK	Good	Very Good	Very Bad	Bad	OK	Good	Very Good
Noise	Very Bad	Bad	OK	Good	Very Good	Very Bad	Bad	OK	Good	Very Good
Toys/books	Very Bad	Bad	OK	Good	Very Good	Very Bad	Bad	OK	Good	Very Good
Plants	Very Bad	Bad	OK	Good	Very Good	Very Bad	Bad	OK	Good	Very Good

Figure 1: The survey used for child/adolescent and parent/guardian participants. Note that the age question was only able to distinguish between different ages for the child/adolescents *continued*



	WAITING ROOM					THERAPY ROOMS				
Artwork	Very Bad	Bad	OK	Good	Very Good	Very Bad	Bad	OK	Good	Very Good
Lighting	Very Bad	Bad	OK	Good	Very Good	Very Bad	Bad	OK	Good	Very Good

I have felt…	WAITING ROOM				THERAPY ROOMS			
Bored	Never	Sometimes	Often	Always	Never	Sometimes	Often	Always
Afraid	Never	Sometimes	Often	Always	Never	Sometimes	Often	Always
Uncomfortable	Never	Sometimes	Often	Always	Never	Sometimes	Often	Always
Calm	Never	Sometimes	Often	Always	Never	Sometimes	Often	Always

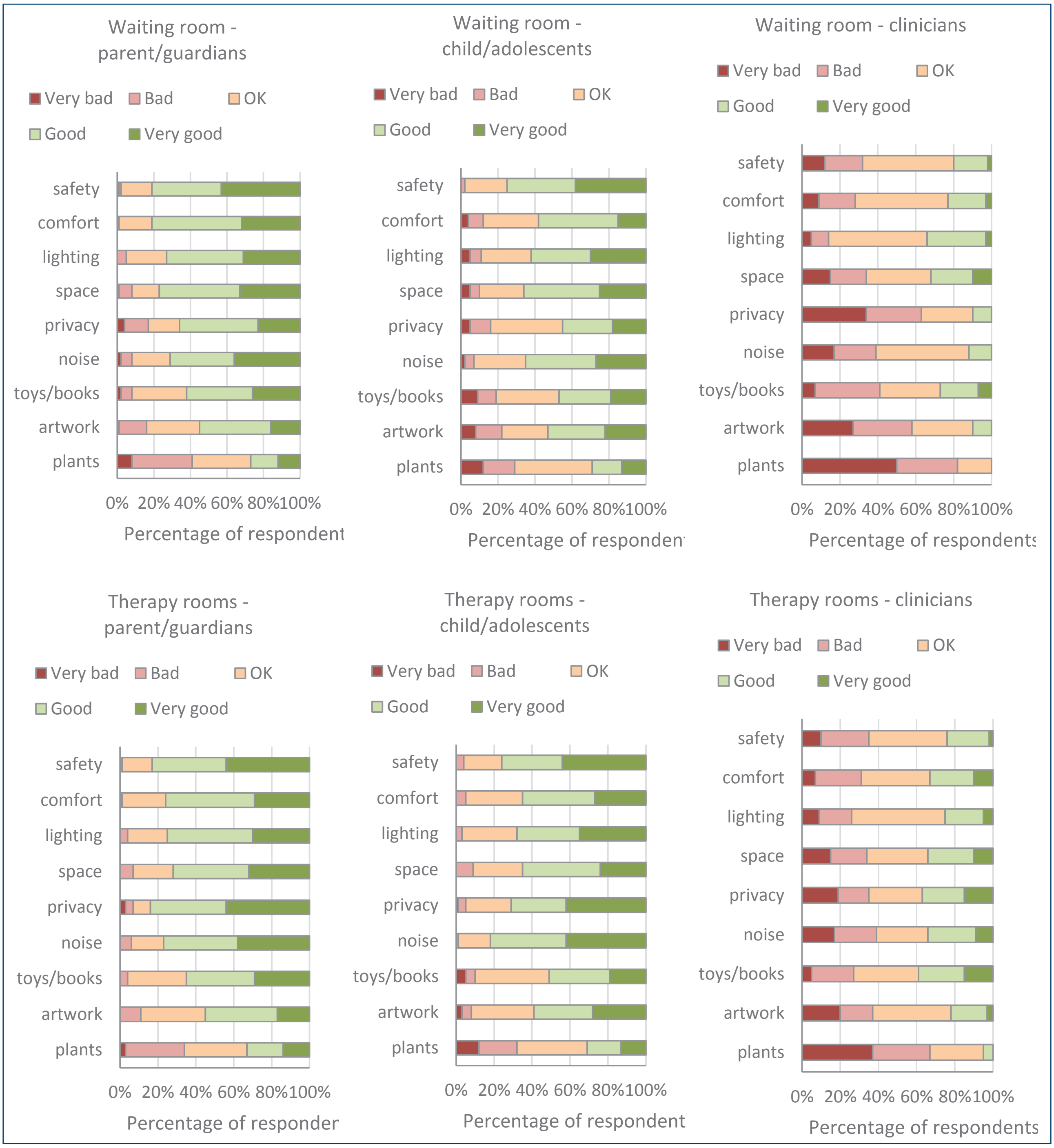
Results

The ratings for all environmental attributes for the waiting room, and therapy rooms, across each surveyed group are provided in Figure 2. Across all attributes, for both the waiting room and therapy rooms, the client respondents gave largely positive ratings. Comparatively, the clinicians were consistently less positive in their appraisals.

It was expected that positive inter-relationships would exist between appraisals of the different environmental attributes. Due to the existence of negative skew in the ratings of clients (see Figure 2), Spearman rank correlations were conducted. With nine environmental attributes rated, for both the waiting room and therapy rooms, across all groups, there were a total of 216 correlation values obtained. For the sake of brevity, the patterns of inter-correlations are summarised in a single table (see Table 1) instead of reporting six large correlation tables. As reported in Table 1, the pattern of correlations was consistent with expectations that ratings among the different attributes would be consistently moderately positively associated.

An overall appraisal score across each of the surveyed groups, for both the waiting room and therapy rooms, was obtained via averaging across ratings for the different attributes. The mean overall appraisal scores are presented in Figure 3. The overall waiting room and therapy rooms appraisal score was strongly positively associated for the parents/guardians (Pearson $r = .91$, $p < .001$), child/adolescents (Pearson $r = .74$, $p < .001$), and clinicians (Pearson $r = .67$, $p < .001$). A 3

Figure 2: Participant ratings of the waiting room and therapy rooms for a number of different environmental attributes

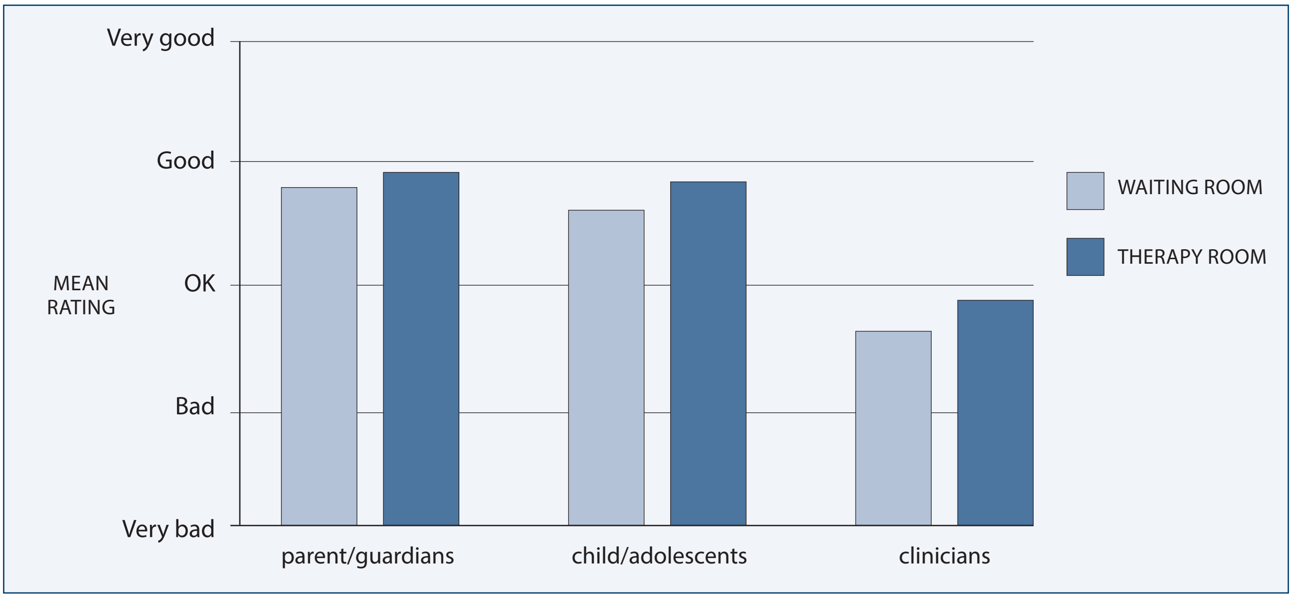


(group – child/adolescents, parent/guardians, clinicians) x 2 (space – waiting room, therapy rooms) mixed design ANOVA was conducted to examine differences among the mean overall appraisal scores. A significant main effect of group was obtained (F(2,209) = 48.88, p < .001, ηp2 = .32), with follow up comparisons revealing the clinicians were overall more negative in their appraisal of the clinic environment compared to both the child/adolescents and parent/guardians (ps < .05). There was no significant difference found between child/adolescents and parent/guardians (p > .05). There was also a small significant main effect of space (F(1,209) = 35.11, p < .001, ηp2 = .14), with no significant interaction between group and space (F(2,209) = .85, p = .43, ηp2 = .01). As can be observed in Figure 3 the main effect of space was obtained due to a consistently more favourable appraisal of the therapy rooms compared to the waiting room space across the three groups of participants. However this effect is much smaller than the overall difference between clinicians compared with the other two groups.

Table 1: Summary of the Spearman inter-correlations between ratings for the different factors - across the total 216 correlation values only two were statistically non-significant

	MEAN SPEARMAN CORRELATION BETWEEN RATINGS OF FACTORS (STANDARD DEVIATION)	CORRELATION RANGE
WAITING ROOM		
Parent/guardians	.56 (.11)	.33 – .78
Child/adolescents	.48 (.11)	.25 – .65
Clinicians	.69 (.12)	.14 – .71
THERAPY ROOMS		
Parent/guardians	.69 (.12)	.43 – 85
Child/adolescents	.46 (.13)	.19 – .67
Clinicians	.56 (.13)	.37 – .92

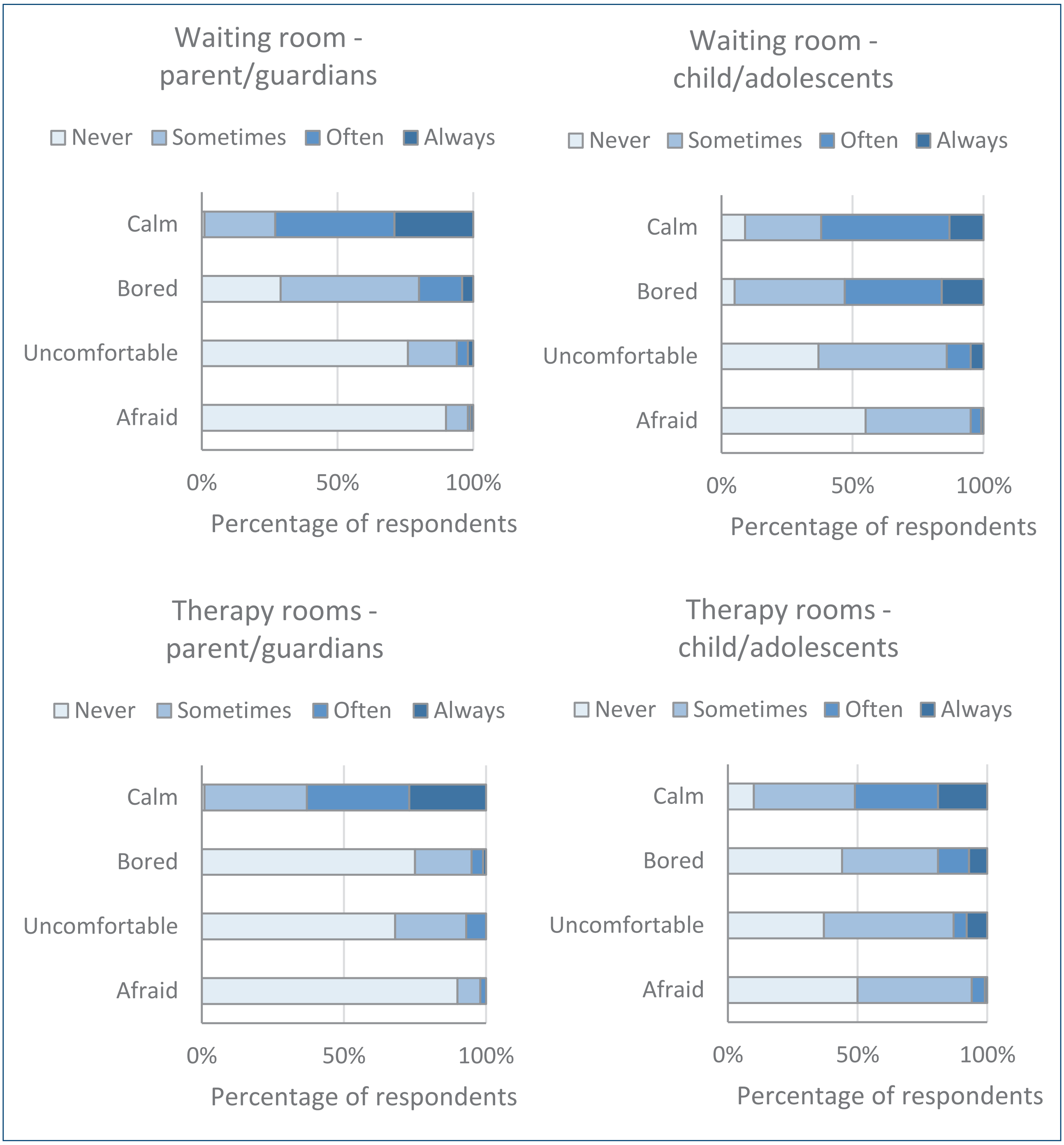
Figure 3: The mean overall participant appraisal of the physical environment for the waiting room and therapy rooms. Bars represent 95% confidence limits



Exploring the self-reported client emotional experience in the waiting room and therapy rooms revealed encouraging results, see Figure 4. The parent/guardians and child/adolescents typically reported feeling calm 'often' in both the waiting room and therapy rooms. The experience of negative emotions (i.e., afraid, uncomfortable, and bored) was generally rated 'sometimes' or less. An exception is the reported boredom of child/adolescents in the waiting room with around half of respondents stating 'often' or 'always'.

Of interest was the extent the overall appraisal of the physical environment might associate with client self-reported emotional experience in the clinic space. Due to the use of a 4-point scale and the highly skewed nature for some of the variables, Spearman rank correlations were carried out instead of Pearson correlations, (see Table 2). A moderate positive association was found between feeling calm in the clinic and appraisal of the physical environment. Moderate negative associations were found between feeling bored and uncomfortable and appraisal of the physical environment. Only small negative or non-significant associations were found between appraisals of the physical environment with self-reported fear. Overall, results were consistent with expectations that emotional experience when in the clinic would have a relationship with appraisal of the clinic physical environment.

Figure 4: Ratings of different emotions experienced in the waiting room and therapy rooms by parent/guardian and child/adolescent respondents.



The client survey included an option to provide written feedback about the clinic's physical environment. There were 31 parent/guardians (36%) and 16 child/adolescents (20%) who provided a comment. Comments were fairly evenly split between two broad types: suggestions for improvement, for example: 'Tissues in waiting room please. Why do chairs in waiting room have to FACE other people?', and praise for the service, for example: 'My daughter's counsellor and the staff are amazing and very helpful in every situation'.

In the present study it was also expected that appraisal of the physical environment by clinicians would be associated with their self-reported overall work satisfaction. When asked the statement 'Working at CAMHS I feel satisfied with working conditions' clinician responses were: not at all (22%), somewhat (36%), moderately (25%), Very (15%), and extremely (2%). Responses to this statement were positively correlated with both appraisal of the waiting room (Pearson $r = .60$, $p < .001$) and therapy rooms (Pearson $r = .57$, $p <$

Table 2: Spearman correlations between the self-reported level of emotion experienced in the clinic with overall appraisal of the physical environment score for parents/guardians and child/adolescents, in the waiting room and therapy rooms

	PARENTS/GUARDIANS		CHILD/ADOLESCENTS	
	WAITING ROOM	THERAPY ROOMS	WAITING ROOM	THERAPY ROOMS
Calm	.43*	.41*	.48*	.53*
Bored	-.40*	-.36*	-.49*	-.46*
Uncomfortable	-.56*	-.47*	-.52*	-.38*
Afraid	-.29*	-.20	-.02	-.17 *

p<.05

.001). Therefore results suggest that clinicians reporting a more favourable appraisal of the physical environment also tended to report a higher level of overall work satisfaction.

Discussion

There is abundant research literature investigating the impact of the physical environment in office settings, [7,22,23] however research investigating environmental influences in the context of mental health services is limited. [8] Therefore the present study sought to add to the research literature by examining clinicians and client perceptions of the quality of the physical environment in CAMHS. Of additional interest was, how these perceptions would relate to the emotional experience reported by clients and the work satisfaction reported by clinicians. Across all clinics, the mean overall rating by child/adolescents and parent/guardians for both the waiting room and therapy rooms was 'good'. Clinicians were found to have a significantly lower appraisal of the physical environment with a mean overall appraisal of 'OK'. The precise reason for the discrepancy between clients and clinicians is beyond the scope of the present research. Perhaps the more positive appraisal of clients is related to the quality of service they receive. Or perhaps the more negative appraisal of clinicians is related to the fact that clinicians occupy the space to a greater extent, and this familiarity lends itself to noticing all the imperfections within the physical environment.

In the present study the emotional self-reported experience of clients within the clinic space was examined and results were encouraging as most parents/guardians and child/adolescents reported being calm in both the waiting room and therapy rooms 'often'. Responses to negative emotions such as boredom, uncomfortableness and fear were typically reported as 'sometimes' or 'never'. Therefore results of the present study suggest that in the Western Australian metropolitan CAMHS surveyed there was an overall positive appraisal of the physical environment and overall positive emotional experience reported by clients. An aim of the present study was to investigate if the client appraisal of the physical environment would be associated with their reported emotional experience. A moderate-strong positive association was found between the client perception of the physical environment and their overall emotional experience within the environment. Therefore results were consistent with expectations that the physical environment and emotional experience when in the clinic would be associated. This provides empirical evidence to support the intuitive notion that the physical environment can influence the experience of clients. In a mental health context the practical implication is that an improved physical environment is likely to improve the therapeutic process and therefore increase efficiency and efficacy of a clinic. Furthermore, these findings support the strategy taken by the National Youth Mental Health Foundation's Headspace initiative to be mindful in the design of the physical environment for mental health services. [16,17]

Another important finding of the present study was that many of the surveyed clinicians were relatively dissatisfied with the physical work environment, and that satisfaction with the physical work environment had a strong positive association with reported overall work satisfaction. The present study is therefore consistent with literature reporting an association between an appraisal of the physical environment with work satisfaction in a range of settings. [21,22] By their very nature, service industries are focused more upon maintaining a positive client experience rather than upon the service provider, however mental health services are arguably at the extreme end of the spectrum for focus upon client experience over service provider experience. A focus on the client is obviously of paramount importance for mental health services, however research literature suggests that working in the mental health industry puts additional strain upon staff compared to other industries due to constant exposure to individuals experiencing emotional/mental distress. [28] This places mental health workers at an elevated risk of burnout that can reduce productivity and morale that can consequently produce increased levels of staff turnover. [25,26] Results suggest that improving the quality of the physical environment has potential to not only foster positive client emotional experience, but also is likely to increase clinician work satisfaction in mental health services.

In order to improve the physical environment, service managers will constantly question where to allocate their limited resources. In the present study separate ratings for a number of indoor environmental attributes (comfort, safety, space, privacy, lighting and noise) and interior design attributes (toys/books, artwork and plants) were obtained from clinicians and clients. Results supported an interpretation that clinicians and clients have a holistic perception of the clinical environment, where all surveyed environmental attributes influence each other, and in turn the overall perception of the environment. For example, a nice piece of artwork might make a small space seem larger, or a noisy environment might detract from a sense of privacy, and so on. These results are consistent with research findings in other service environments reporting inter-relationships among the perception of different environmental attributes. [27] A practical recommendation from the findings of the present research is that service managers need not be resigned to accepting a bad spot within a facility. As an example, an area that might be considered a bit cramped could be enhanced via a number of different actions like soundproofing, investing in appropriate artwork/toys/plants, improving lighting, and more comfortable furnishings. Further research is required in order to tease apart the relative importance of different kinds of attributes (e.g., is investing in a plant more effective than a piece of artwork?). This type of enquiry would be best served by experimental approaches such as what has been previously conducted by Devlin and colleagues. [13-15]

A limitation of the present study was the correlational, rather than experimental, methodology. Expected relationships were found between appraisal of the physical environment and outcome measures such as emotional experience and work satisfaction. However the correlational nature of results leaves open the possibility that the outcome measures were also influencing appraisal of the physical environment. For example, a highly anxious client may come into the clinic feeling uncomfortable, and this may influence their perception of how comfortable the environment is. Alternatively, the open-ended responses provided by clients suggested that when completing the survey the clients might have been influenced by their positive experience of the service they were receiving. For example, a parent/guardian commented 'considering what you guys do to help... I can't complain. At the end of the day - if I get the same level of service I'm getting now - I'll be happy to sit on a milk crate – Thanks guys you all rock'. It might be that in a mental health context clients are more focused upon their own subjective experience, and their experience of receiving help, rather than critically appraising the physical environment. In another example a child/adolescent commented 'this place is great, everyone is nice and I rarely feel anxious here. Thanks.' This is consistent with research suggesting that receiving good service can influence the overall experience and perception of a service environment. [29] In future research, it would be useful to obtain first impressions regarding the physical environment and investigate if these impressions can predict future therapeutic alliances and outcomes. Another method of inquiry might be to experimentally vary the physical environment for therapy sessions to explore how the environment influences important therapeutic factors such as extent of self-disclosure and reported level of comfort. The possibility that client therapeutic experience may be influencing their perception of the physical environment does not however preclude the usefulness of present research findings. Instead, the implication is that future research needs to consider and control for pre-existing emotion in order to fully uncover the impact the physical environment is having upon the client. The present study produced findings that suggest a possible bi-directional relationship exists between emotional experience and physical surroundings that warrant further investigation.

Competing interests

The authors declare that they have no competing interests.

References

1. Ackerman SJ, Hilsneroth MJ. A review of therapist characteristics and techniques positively impacting the therapeutic alliance. Clin Psychol Rev. 2003;23(1):1-33.
2. Pressly PK, Heesacker M. The physical environment and counseling: a review of theory and research. J Couns Dev. 2001;79:148-60.
3. Weeks W. Creating attractive services which citizens want to attend. Australian Social Work. 2004;57(4):319-30.
4. Miwa Y, Hanyu K. The effects of interior design on communication and impressions of a counselor in a counseling room. Environ Behav. 2006;38:484-502.
5. Aries MBC, Veitch JA, Newsham GR. Windows, view, and office characteristics predict physical and psychological discomfort. J Environ Psychol. 2010;30:533-41.
6. Devlin AS, Arneill AB. Health care environments and patient outcomes: a review of the literature. Environ Behav. 2003;35:665-94.
7. Rashid M, Zimring C. A review of the empirical literature on the relationships between indoor environment and stress in health care and office settings: problems and prospects of sharing evidence. Environ Behav. 2008;20(2):151-90.
8. Connellan K, Gaardboe M, Riggs D, Due C, Reinschmidt A, Mustillo L. Stressed spaces: mental health and architecture. Health Environments Research and Design Journal. 2013;6(4):127-268.
9. Ornstein S. First impressions of the symbolic meanings connoted by reception area design. Environ Behav. 1992;24:85-110.
10. Arneill AB, Devlin AS. Perceived quality of care: the influence of the waiting room environment. J Environ Psychol. 2002;22:345-60.
11. Greenburg RP. Effects of impresession information on perception of the therapist and receptivity to influence in a psychotherapy analogue. J Consult Clin Psychol. 1969;33(4):425-9.
12. Claiborn CD, Schmidt LD. Effects of impresession information on the perception of the counselor in an interview. J Couns Psychol. 1977;24(4):259-63.
13. Nasar JL, Devlin AS. Impressions of psychotherapists' offices. J Couns Psychol. 2011;58(3):310-20.
14. Devlin AS, Nasar JL, Cubukcu E. Students' impressions of psychotherapists' offices: cross-cultural comparisons. Environ Behav. 2013:1-26.
15. Devlin AS, Nasar JL. Impressions of psuchotherapists' offices: do therapists and clients agree? Prof Psychol Res Pr. 2012;43:118-22.
16. McGorry PD, Bates T, Birchwood M. Designing youth mental health services for the 21st century: examples from Australia, Ireland and the UK. Br J Psychol. 2013;202:s30-s5.
17. Rickwood DJ, Telford NR, Parker AG, Tanti CJ, McGorry PD. headspace – Australia's innovation in youth menthal health: who are the clients and why are they presenting? Med J Aust. 2014;200:1-4.
18. Jorm AF. How effective are 'headspace' youth mental health services. Aust N Z J Psychiatry. 2015;49(10):861-2.
19. Simmons M, Parker AG, Hetrick SE, Telford NR, Bailey A, Rickwood DJ. Development of a satisfaction scale for young people attending youth mental health services. Early Interv Psychiatry. 2014; 8(4):382-6.
20. Rickwood DJ, Nicholas A, Mazzer K, Telford NR, Parker AG, Tanti CJ, ,et al. Satisfaction with youth mental health services: further scale development and findings from headspace - Australia's National Youth Mental Healh Foundation. Early Interv Psychiatry. 2015.
21. Veitch JA, Charles KE, Farley KMJ, Newsham GR. A model of satisfaction with open-plan office conditions: COPE field findings. J Environ Psychology. 2007;27:177-89.
22. Davis MC, Leach DJ, Clegg CW. Chapter 6: The physical environment of the office: Contemporary and emerging issues. International Review of Industrial and Organizational Psychology. 2011; 26:193-237.
23. Thayer JF, Verkuil B, Brosschotj JF, Kevin K, West A, Sterling C, et al. Effects of the physical work environment on physiological measures of stress. Eu J Cardiovasc Prev Rehabil. 2010;17:431-9.
24. Folkins C, O-Reilly III C, Roberts K, Miller S. Physical environment and job satisfaction in a community mental health center. Community Ment Health J. 1977;13(1):24-30.
25. Littlewood S, Case P, Gater R, Lindsey C. Recruitment, retention, satisfaction and stress in child and adolescent psychiatrists. Psychiatr Bull. 2003;27:61-7.
26. Aarons GA, Sawitzky AC. Organisational climate partially mediates the effect of culture on work attitudes and staff turnover in mental health services. Administration and Policy in Mental Health Services Research. 2006;33(3):289-301.
27. Spielmann N, Laroche M, Borges A. How service seasons the experience: Measuring hospitality servicescapes. International Journal of Hospitality Management. 2012;31(2):360-8.
28. Hannigan B, Edwards D, Burnard P. Stress and stress management in clinical psychology: findings from a systematic review. J Ment Health. 2004;13(3):235-45.
29. Weinstein N, Legate N, Przybylski AK. Beauty is in the eye of the psychologically fulfilled: how need satisfying experiences shape aesthetic perceptions of spaces. Motiv Emot. 2013;37(2):245-60.

Development of a Consumer Engagement Framework

L Lizarondo, K Kennedy and D Kay

Abstract

Objective: The purpose of this project was to develop a Consumer Engagement Model to plan for effective baby boomer engagement to inform policy makers in the healthcare system. This is the first stage of that process.

Design: Initial model development for healthcare systems based on literature review and author group experience in evidence-based practice and research, and consumer advocacy and engagement.

Setting and population: South Australian health and community service systems, and healthcare professionals that work with baby boomers.

Findings: To develop an evidence-based Consumer Engagement Plan, it is recommended that policy makers undertake the four steps outlined in this document to design a question, determine consumer and community segments and scope of engagement, determine the breadth and depth of engagement and address the implications, assess risk and develop strategic partnerships to ensure the Plan is evidence-based, reasonable and achievable.

Conclusions: We believe this process provides a framework for planning consumer engagement and for implementation, monitoring, evaluation and review of consumer engagement for policy excellence. We propose to undertake a validation of the model thus populating the model with examples of practice-based strategies and revising the model accordingly.

Abbreviations: EBP – Evidence-Based Practice; IAP2 – International Association of Public Participation; PIO – Patient Intervention and Outcome.

Key words: employability skills; generic skills; health services management; graduates; higher education.

Lucylynn Lizarondo
International Centre for Allied Health Evidence
University of South Australia
Adelaide, South Australia, Australia.

Kate Kennedy
International Centre for Allied Health Evidence
University of South Australia
Adelaide, South Australia, Australia.

Debra Kay
International Centre for Allied Health Evidence
University of South Australia
Adelaide, South Australia, Australia.

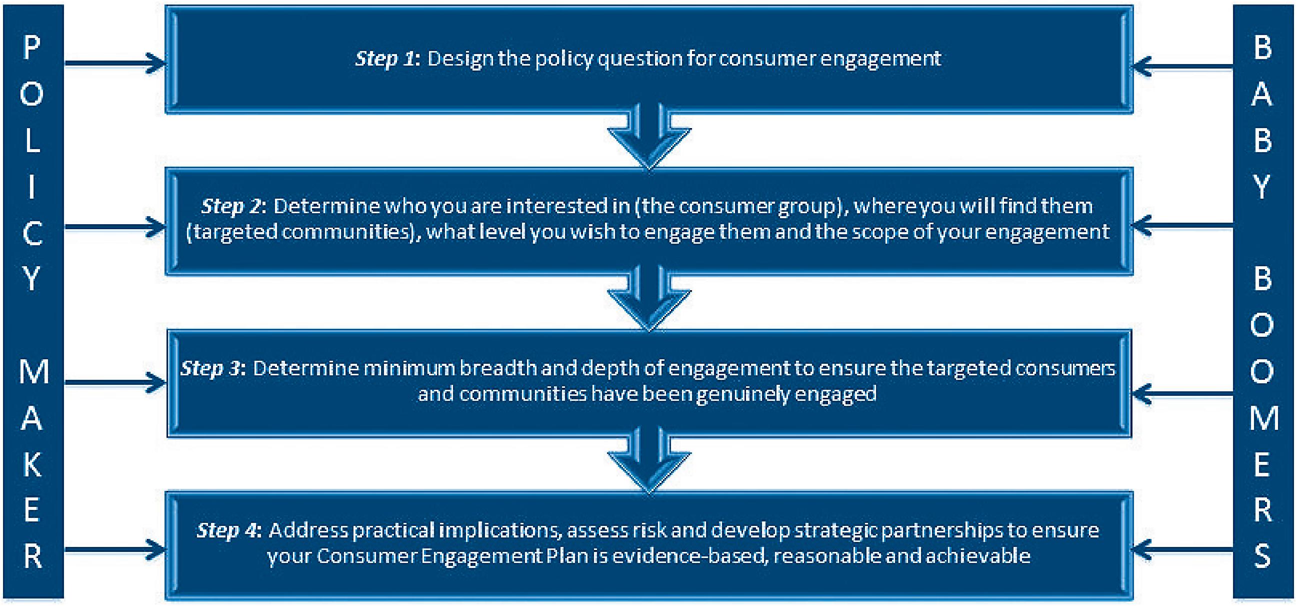
Correspondence:
kate.kennedy@unisa.edu.au

Introduction

Partnering with consumers is a policy and practice imperative for Australian health services. [1] The SA Health Office for the Ageing sought advice about the best practice for the engagement of baby boomers in policy development. Public participation in community policy and decision-making is well established through the International Association of Public Participation (IAP2) Spectrum. [2]

A rapid review of the published and grey literature was proposed to provide a synthesis of the available research evidence on effective approaches to engaging baby boomers with policy makers. Baby boomers are people who are born between 1946 and 1965. The rapid review aimed to address four questions; what approaches or strategies have been used by policy makers to effectively engage baby boomers on issues related to ageing? What outcomes have been reported for these strategies or approaches? What are the barriers to effective engagement of baby boomers with policy makers? What strategies or incentives can be used to ensure that boomers become engaged with policy makers? Inclusion and exclusion criteria were established and CINAHL, Embase, Medline, Informit health, PsychInfo, Scopus, Web of Science, Academic Search Premier, Business Source Complete, Ageline, AMED and Google scholar were searched. A total of 3506 results were found in the search. There were 3500 articles from the peer reviewed databases and a further six from the grey literature searching. Based on inclusion and exclusion criteria 85 potentially relevant articles were retrieved for full text perusal. No articles or reports were found that were relevant to the research questions.

Figure 1 Consumer Engagement Process



Step 1: Design the policy question for consumer engagement

Step 2: Determine who you are interested in (the consumer group), where you will find them (targeted communities), what level you wish to engage them and the scope of your engagement

Step 3: Determine minimum breadth and depth of engagement to ensure the targeted consumers and communities have been genuinely engaged

Step 4: Address practical implications, assess risk and develop strategic partnerships to ensure your Consumer Engagement Plan is evidence-based, reasonable and achievable

Policy makers cannot wait for the literature to emerge. In this paper, we have therefore proposed a four-step model to develop consumer engagement plans with baby boomers. Our intention is to validate this model with baby boomers and lead health and community policy and service agencies working with this population.

The four-step model was informed by the results of the above search of the consumer and evidence- based practice (EBP) literature for relevant tools or frameworks and by the authors' collective research, policy and practice experience in consumer representation and EBP. Figure 1 outlines the steps in the model and highlights the equal input from policy makers and baby boomers (i.e. consumers) in the process. Table 2 outlines what this may look like.

Step 1: Design the policy question for consumer engagement

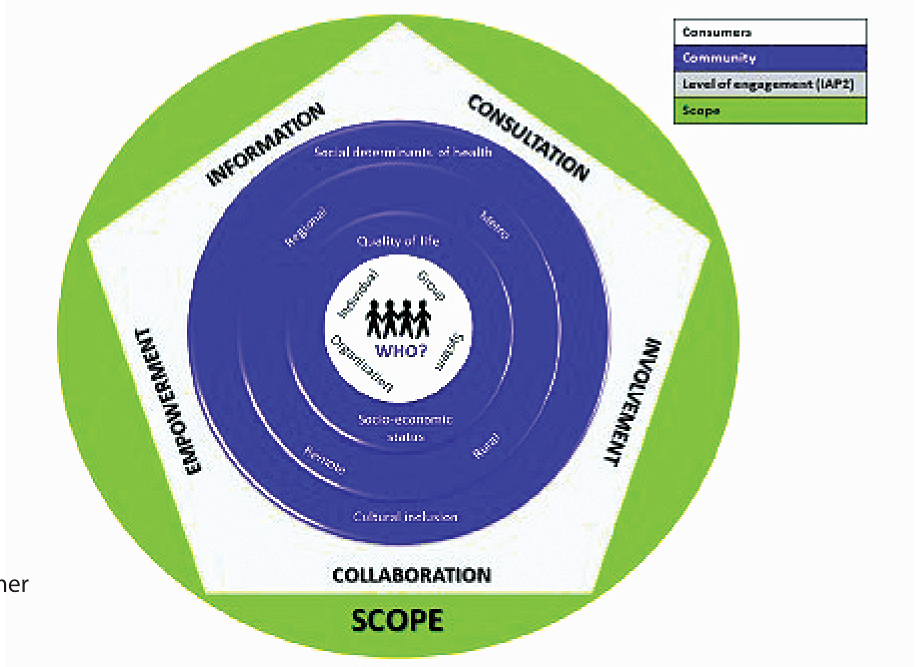
When engaging with consumers, policy makers need clear, concise questions for which they are seeking answers and comments. Using a standard and proven framework for framing questions enables clarity when inviting consumers to contribute, consistency in recording and reporting on engagement outcomes, alignment with any literature search results and comparability with other consumer engagement activities and outcomes.

The PIO (patient, intervention and outcome) is an effective and commonly used question-forming framework in EBP (see table 1). [3,4]

Table 1: PIO definition and example

	WHAT IT MEANS	EXAMPLE
P	Population (i.e. consumers) *Who are you engaging with?* *What are their characteristics?*	*Unemployed female baby boomers living in remote, low socio-economic status (SES) communities*
I	Intervention (i.e. scope of interest) *What potential policy/strategy do you want consumers to engagewith?*	*Government subsidisation of internet access*
O	Outcome *What are the relevant outcomes?*	*Views and perspectives about subsidisation of this population*

Figure 2: Variables involved in Consumer Engagement



Components of the consumer engagement variables

Having framed a quality question, policy makers can then consider how to engage consumers.

Step 2: Determine who you are interested in (the consumer group), where you will find them (targeted communities), and at what level you wish to engage with them and the scope of your engagement

The results of the rapid review of the literature and experiences of the authors lead to the development of a draft Consumer Engagement Variables as shown in Figure 2.

Components of the consumer engagement variables

Consumers – The people or population segment with whom we engage (e.g. baby boomers): this can be as individuals; in groups; via an organisation; or systemically. This is the standard way consumer advocacy organisations (i.e. the Health Consumers Alliance) align people.

Community – The communities with whom we want to engage; the communities identified in our model are based on the determinants of active ageing (see figure 3). [5]

Figure 3: Determinants of active ageing and their interactions. Adapted from: World Health Organisation (WHO) (2002) Active Ageing: a policy framework. [5]

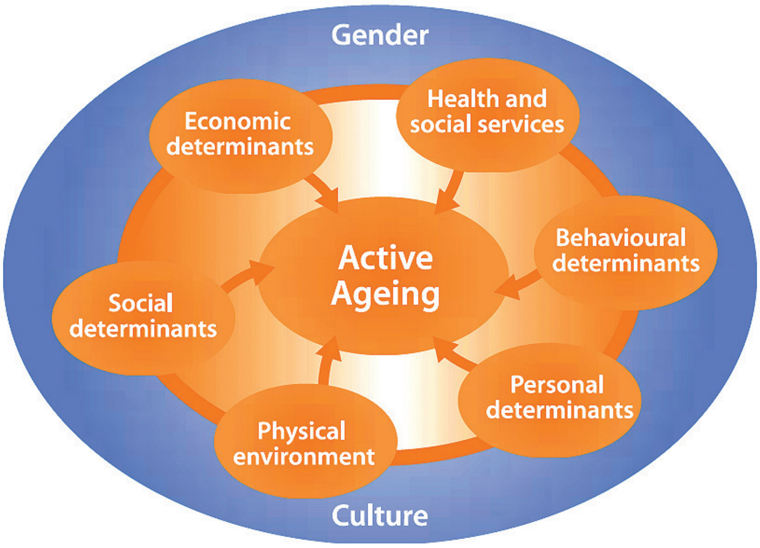


Figure 4: IAP2 Spectrum of Participation. From the International Association for Public Participation (2004) IAP2 Public Participation Spectrum. [2]

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision. We will seek your feedback on drafts and proposals.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will work together with you to formulate solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

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WHO's Active Ageing Policy Framework [5] articulates how the broad social determinants of health and wellbeing affect the process of ageing. Gender and culture are identified as two 'cross-cutting' determinants which influence all the others that include health and social services access, behavioural factors such as physical activity and nutrition, physical environment such as housing and food security, social factors such as education and social support, personal factors such as biology and disability, and economic factors such as income and employment.

Neither WHO, nor the literature on ageing more broadly, has yet analysed the differential impact of these determinants on baby boomers or the subgroups within this cohort.

We suggest the use of the levels of engagement as described in the IAP2 Public Participation Spectrum [2] to determine the engagement required to answer the question (see figure 4). Finally, the sector or setting to which the question is relevant should also be determined (i.e. Scope).

Step 3: Determine minimum breadth and depth of engagement to ensure the targeted consumers and communities have been genuinely engaged

Breadth of information (how many consumers to engage)

It is not practical, feasible nor necessary to engage the whole consumer population to inform policy: the challenge is to have a statistically sound reason for the number of consumers (i.e. sample) we do engage (breadth). In order to obtain a sample that is representative of the population, we considered two concepts: precision and stratification. Statistical precision is defined as the closeness with which the sample can be expected to approximate the relevant population value. [6] The level of precision must be assumed and justified.

In computing for sample size, the consideration of respondents' characteristics may also be included. Stratification of the respondents' characteristics may increase the efficiency of estimating the overall population parameter and will make the survey easier to run administratively. Proportional allocation is usually employed wherein the size of the sample in each stratum is proportional to the size of the stratum. However, in using too many levels, the sample size within the strata may be too low. [7]

In research involving baby boomers, the different factors to be considered for sample size may include social determinants of health, location, quality of life and even demographic characteristics.

Depth of information (more extensive engagement)
Obtaining an adequate number of consumers may provide the breadth of information required by policy makers, however, in itself may not be sufficient to provide a comprehensive understanding of the issue of interest (depth). A focus group approach can be used to engage in depth, and is particularly useful when the aim is to explore consumers' perspectives, capitalising on the interaction between and among participants to stimulate and refine thoughts and perspectives. It provides the opportunity to derive a collective perspective and validate ideas amongst participants. Sufficient engagement has been conducted when data saturation has been achieved, i.e. when additional information no longer generates new understanding. [8]

Step 4: Address practical implications, assess risk and develop strategic partnerships to ensure your Consumer Engagement Plan is evidence-based, reasonable and achievable.

In this step, practical limitations such as human and other resources are considered. Policy makers may undertake a risk assessment to determine the extent and limits of engagement. The consequent Consumer Engagement Plan enables policy makers to inform management about why the recommended consumer engagement strategies should, must or need not occur and the scope and limits of what can be claimed based on the consumer engagement that is actually undertaken.

Once a decision is made to operationalise the Consumer Engagement Plan, policy makers may face the challenge of contacting and contracting with consumers to make it happen. Different outcomes are likely dependent on who communicates the consumer engagement invitation; the

Table 2. Example of how the Consumer Engagement Model might look

Step Description Example Step 1: Design the policy question for consumer engagement.	When engaging with consumers, policy makers need clear, concise questions for which they are seeking answers and comments.	What are the views and perspectives bout government subsidisation of internet access of female baby boomers?
Step 2: Determine who you are interested in (the consumer group), where you will find them (targeted communities), what level you wish to engage them and the scope of your engagement.	The draft consumer engagement model encompasses the consumers, community, level and scope of engagement.	*Consumers:* Baby boomers (citizens born between 1946 and 1964). *Community:* unemployed female baby boomers, of low socio-economic status, in remote communities, *Level:* Consultation level only. *Scope:* Remote communities, government policy (subsidisation of utility pricing, tax policy, social services).
Step 3: Determine minimum breadth and depth of engagement to ensure the targeted consumers and communities have been genuinely engaged.	How many consumers to engage (breadth). More extensive engagement (depth).	Example: Breadth of information – based on a statistical test, a total of 153 (hypothetical value only*) baby boomers will participate: Depth of information – of the 153, 60 (hypothetical only) will participate in focus group interview. *Formal guidance from experts is required to determine the specific number of participants.
Step 4: Address practical implications, assess risk and develop strategic partnerships to ensure your Consumer Engagement Plan is evidencebased, reasonable and achievable.	In this step, practical limitations such as human and other resources are considered.	

author, authority, form and format of the communication; and the accessibility and relevance of the engagement options offered. Unless consumer engagement is part of the routine work of the organisation, it is likely communications with consumers will need to occur with and through cultural and community organisations whose everyday business involves established trusted relationships with consumers.

Table 2 outlines the steps in the Consumer Engagement Model and provides some practical examples.

Summary

To develop an evidence-based, practice informed Consumer Engagement Plan, it is recommended that policy makers develop a policy question using a framework such as the PIO; use the consumer engagement model to determine consumer segment, targeted communities, level of engagement and scope of engagement; determine minimum breadth and depth of engagement to ensure the targeted consumers and communities have been genuinely engaged; and address practical implications, assess risk and develop strategic partnerships to ensure the Plan is evidence-based, reasonable and achievable.

The authors propose to validate the model with up to five lead health and community policy and service agencies working with baby boomer populations, populate the model with guiding principles and values, and examples of practice-based strategies including avenues for engagement, and revise the model accordingly and present this, with sample strategies relevant to baby boomers.

Competing Interests

The authors declares that they have no competing interests.

References

1. Australian Commission on Safety and Quality in Health Care. Safety and Quality Improvement Guide Standard 2: Partnering with Consumers 2012. Available from: http://www.safetyandquality.gov.au/our-work/patient-and-consumer-centred-care/
2. The International Association for Public Participation (IAP2). IAP2's Public Participation Spectrum 2014. Available from: https://www.iap2.org.au/resources/iap2s-public-participation-spectrum
3. Huang X, Lin J, Demner-Fushman D. Evaluation of PICO as a Knowledge Representation for Clinical Questions. AMIA Annual Symposium Proceedings. 2006:359-363.
4. Schardt C, Adams MB, Owens T, Keitz S, Fontelo P. Utilization of the PICO framework to improve searching PubMed for clinical questions. BMC Medical Informatics and Decision Making. 2007; 7(1):16. doi:10.1186/1472-6947-7-16
5. World Health Organization (WHO). Active Ageing: a policy framework 2002. Available from: http://www.who.int/ageing/publications/active_ageing/en/
6. Kelley K, Maxwell S, Rausch J. Obtaining power or obtaining precision. Evaluation and the Health Professions. 2003; 26(3):258-287.
7. Turner AG. Sampling Strategies. United Nations Secretariat ESA/STAT/AC.93/2, Statistics Division. 2003;1-45.
8. Onwuegbuzie AJ, Dickinson WB, Leech NL, Zoran AG. A qualitative framework for collecting and analyzing data in focus group research. International Journal of Qualitative Methods. 2009; 8(3):1-21.

RESEARCH ARTICLE

Best Practice Pathology Collection in Australia

V Pilbeam, L Ridoutt and T Badrick

Abstract

Objectives: The specific objectives of the study were to (a) identify current best practice in pathology specimen collection and assess the extent to which Australian pathology services currently satisfy best practice standards; and (b) identify training and other strategies that would mitigate any gaps between current and best practice.

Methods: A total of 22 case studies were undertaken with pathology collector employers from public, not for profit and private pathology organisations and across urban and rural locations and eight focus groups with pathology collection services consumers were conducted in December 2012 in four different cities.

Results: The preferred minimum qualification of the majority of case study employers for pathology collectors is the nationally recognised Certificate III in Pathology. This qualification maps well to an accepted international best practice guideline for pathology collection competency standards but has some noted deficiencies identified which need to be rectified. These particularly include competencies related to communicating with consumers. The preferred way of training for this qualification is largely through structured and supervised on the job learning experiences supported by theoretical classroom instruction delivered in-house or in off the job settings. The study found a need to ensure a greater proportion of the pathology collection workforce is appropriately qualified.

Conclusion: The most effective pathway to best practice pathology collection requires strong policies that define how pathology samples are to be collected, stored and transported and a pathology collection workforce that is competent and presents to consumers with a credible qualification and in a professional manner.

Abbreviations: CHF – Consumer Health Forum of Australia; KIMMS – Key Incident Monitoring and Management Systems; NAACLS – National Accrediting Agency for Clinical Laboratory Sciences; NACCHO – National Aboriginal Community Controlled Health Organisation; NPAAC – National Pathology Accreditation Advisory Council; RCPA – Royal College of Pathology Australasia; RTO – Registered Training Organisation.

Key words: pathology collection; phlebotomy; best practice; training; competency.

Victoria Pilbeam
Human Capital Alliance (International) Pty Ltd
Potts Point, New South Wales, Australia.

Lee Ridoutt
Sydney, New South Wales, Australia.

Tony Badrick
Faculty of Health Science and Medicine
Bond University
Gold Coast, Queensland, Australia.

Correspondence:
victoria.pilbeam@humancapitalalliance.com.au

Introduction

Pathology tests are an essential part of the healthcare system, used to aid medical practitioners in the diagnosis of disease, assist in preventive health, acute care, management of chronic conditions and more recently genetic research. [1] In the financial year 2012/2013 there were over 83 million pathology tests conducted in Australia initiating a Medicare benefit. This required over 36 million separate pathology specimen collections – 'specimens' including samples of blood, tissue or body fluid taken from patients – that attracted a Medicare benefit. [2] Additionally, significant pathology testing is undertaken in hospitals in the public health sector.

Accuracy of pathology test results is paramount, and several studies have found that in well-developed health systems error rates are generally low (e.g. Dale and Novis [3] found an average error rate of less than 0.5% across a sample of tests analysed from the United States, Canada, Australia and South Korea). In Australia, analysis of Key Incident Monitoring and Management Systems (KIMMS) data from the Royal College of Pathology Australasia (RCPA) for 2012 [RCPA, personal communication] identifies pathology errors for each quarter from a large sample of pathology laboratories ranged from only 1.38% to 1.56% of all pathology service episodes. Notwithstanding the low error rate, in Australia this could imply problems potentially with over one million tests. Accordingly both industry and consumers continually press for reduced rates of error.

There is a large amount of evidence from the literature identifying the pre-analytical stage (where specimens are collected and transported) as the area that contributes most to errors that occur within pathology testing. [4,5,6] Plebani [1] for instance states:

Most errors are due to pre-analytical factors (46–68.2% of total errors), while a high error rate (18.5–47% of total errors) has also been found in the post-analytical phase.

The majority of pre-analytical errors are attributed to problems with pathology collectors' skill and adherence to procedures. [6] Some researchers [1,5] have argued that skill deficiencies are less prevalent in collection workers supervised by the pathology laboratory when compared with non-laboratory managed personnel (such as nurses and doctors collecting specimens in inpatient and primary care settings). This argument is supported by KIMMS data.

The need for possession of minimum competencies for pathology specimen collection and handling, and maintenance of those competencies to ensure ongoing quality of service, has been identified by the National Pathology Accreditation Advisory Council (NPAAC), [7] and the Consumers Health Forum of Australia (CHF) [8] as a high priority issue and an area where greater attention to promoting best practice could lead to better patient outcomes. This study aimed to better understand what constituted best practice in pathology collection and how it might be achieved in Australia.

Methods

The key source of data for this study was two sets of qualitative data collection processes undertaken with employers of pathology collectors (essentially pathology laboratories) and with consumers of pathology collection services.

A total of 22 case studies were undertaken with pathology collectors' employers across public, not for profit and private pathology organisations and across urban and rural locations. The case study sample population slightly over-represented the public sector (50%) and the not for profit sector (18%) and under-represented the private sector (32%) since one of the major private sector corporate entities determined not to engage with the study. The employer case studies collected data according to an agreed common protocol detailed elsewhere. [9]

Each case study involved interviews with senior managers (Pathology Collections Manager or Training Manager, etc). The interviews were structured to discuss what work pathology collectors were undertaking within their organisations and to collect the following types of documentation for further analysis:

- Position descriptions to analyse the roles, and required skills and attributes of employed collectors;
- Procedural documentation to gain an understanding of current operating procedures and quality control processes; and
- Training manuals, training matrixes and induction procedures to provide an understanding of in-house training programs and ongoing assessment of competency and continuing professional development practices.

In some case study organisations certain documents were not made available or not able to be removed from the premises for further analysis as they were considered the intellectual property of the employer organisations.

In addition to the employer case studies, eight focus groups with pathology collection services consumers were conducted in December 2012 in four different cities. These groups were organised in conjunction with the CHF, the Health Care Consumers Association (Australian Capital Territory), Health Consumers (New South Wales), Health Issues Centre (Victoria), Health Consumers (Queensland) and the National Aboriginal Community Controlled Health Organisation (NACCHO). Group participant numbers ranged from two to 13. The aim of the focus group discussions was to collect details on the experiences and expectations of consumers of pathology collection services in order to identify the required competencies of collectors from the consumer perspective. Focus group discussions were guided by a schedule detailed elsewhere. [9]

Results

Defined collection procedures

All of the case study employers studied had well developed procedures manuals that carefully prescribed the operations, in sequence, which needed to be completed for a successful specimen collection. Analysis of collected procedures manuals from case study employers found that practice guidelines in Australian pathology laboratories correlated well with international recommendations [10] and prevailing practice in a range of comparable countries including the United Kingdom, [11] [12] and the United States. [13]

Pathology collector qualifications

There is no mandatory requirement for pathology collectors to have a particular qualification in Australia however the laboratories that employ collectors are subject to guidelines for laboratory accreditation by NPAAC. In practice this tends to translate into a mixed workforce of formally qualified and unqualified workers, the latter having been generally developed to acceptable levels of competence through on-the-job training.

The most widely recognised 'entry level' qualification by employers was the nationally recognised Certificate III in Pathology (course code HLT32612). All case study employers interviewed accepted this qualification and accordingly had been for some years attempting to gradually replace registered nurses and any unqualified collection staff with those holding the Certificate III qualification. Nevertheless, most employers still had a significant proportion of their staff who did not hold a Certificate qualification III (ranging from 20% to 50%) and most still had a small proportion of registered nurses as pathology collection workers. Analysis of 2006 ABS Population Census data similarly found that just over one third of non-professional laboratory workers were unqualified. [14]

In Victoria and South Australia the preferred entry level qualification was the Certificate IV, although the Certificate IV as it is currently structured differs little from the Certificate III in technical competencies.

Current training for pathology collector qualifications

There were four reasonably distinct approaches to training pathology collectors identified through the employer case studies. These approaches can be described as follows:

A. Completely 'in-house' – A pathology laboratory employer becomes a registered training organisation (RTO) and is delivering the Certificate III in Pathology entirely in-house with employed trainers providing classroom based instruction and structured on the job experiences.

B. Mostly 'in-house' – Similar to above, the pathology service employer has taken control of most of the parameters of training but not attempted to become a RTO and hence needs to 'partner' with an appropriate RTO to have trainees assessed and conferred their recognised (national) qualification.

C. External training and on-the-job – In this arrangement the bulk of the training occurs in classroom or simulated workplace settings within an RTO's facilities. This is followed by a period of structured on the job clinical practice experience. The amount of time spent in clinical practice varies but most commonly was four weeks (approximately 140 hours). This training arrangement was most prevalent in Victoria.

D. External only – All of the training is completed off the job in the education institute's training facilities, through a combination of classroom-based theory and simulated practical experience. This type of approach was seemingly limited exclusively to a small number of private RTOs with accreditation to deliver the Certificate III.

A specific variation on approach 'A' is in West Australia where the public sector provider Pathwest conducts a completely in-house training program but this is not supported by an RTO and does therefore not result in the conferring of a recognised qualification (at least not nationally nor formally recognised).

In the interviews conducted with employers it was found that there was generally a preference for type A and B approaches above, with the majority of interviewees identifying that the skill of pathology collectors was mainly developed through their experience in the role. The more practical experience obtained, generally the higher level of skill achieved. Anecdotally, employers reported difficulties in employing individuals who had undertaken the Certificate III through type D approaches as the course was delivered over too brief a time period and with little to no practical experience and 'graduates' of such programs could struggle to gain employment.

Technical competence of individual pathology collectors

Despite general support for the Certificate III qualification case study employers and consumers through the focus group discussions identified a number of areas that were not adequately covered through the current Certificate III course including:

- Basic computer skills/use of office equipment;
- Transportation of blood specimens;

- Understanding and communicating to consumers the legal requirements of request and consent forms (and gathering patient history in relation to organisational policy to support this);
- Customer service – explaining procedure and identifying special needs of patient, especially language and literacy needs, i.e. finding best way of communicating with patient;
- Teamwork/working with others within a professional health care team;
- Troubleshooting; and
- Ability to evaluate own scope of practice (limitations of own skills) and act within that scope.

Regular consumers of pathology collection (especially blood collection) services reported a perception that some collectors possess better skills than others. Essentially, consumers identified that technical competency concerns were centred on the ability of pathology collectors to find and access a vein within three attempts and that consumers were not bruised as a consequence of the procedure. It was acknowledged that some medical conditions can make accessing a vein difficult for collectors and only collectors with sufficient experience (regardless of their qualification) should be undertaking these types of collections. Similarly, experiences from consumers regarding collections from infants and children identified the need for experienced and competent collectors in order to reduce the trauma of the experience and the chance of consumers developing phobias.

Customer service competence of pathology collectors

Consumers discussed a range of expectations of pathology collection services, especially around 'customer service' competencies of individual collectors. Regularly, consumers reported they attended pathology collection services with limited communication with the pathology collector about what was occurring. One consumer summarised this well:

Most consumers want to be walked through a process, even when they are likely to know what it is all about. I went three times in one week to have blood drawn and was only ever asked my name and date of birth. I was not given any information about what was happening to me. Consumers feel collection staff should treat them each time as if it is their first visit and explain the procedures. Too often no explanation is provided and questions are never invited.

In addition, consumers often required information about how the results would be processed and communicated back to them and felt that this should form part of the explanation of process along with an explanation of billing and payment issues, particularly any out-of-pocket expenses.

Consumers noted in the consultations that patients might lodge a complaint with a collection service if they are dissatisfied with the way in which they were treated or because of poor procedure, for example excessive bruising or nerve damage from a blood collection procedure. However, processes for lodging complaints were considered onerous and likely to minimise the amount of actual complaints lodged.

The major themes from the focus group discussions are similar to those elicited from consumers in the United States,[15] where a large survey to measure patient satisfaction at 540 pathology collection organisations found three main areas of quality and safety consumer concern:

- Characteristics of the organisation offering the service, such as the facilities, ease of access, technology in use, flexibility and scope of services available;
- Individual characteristics of the employees providing the service, such as their attitude, skill, responsiveness, and ability to make decisions; and,
- Unique characteristics of each patient, such as their previous experiences or expectations, personality traits and level of health.

Discussion

A distinction emerged from this study between an industry perspective (that is from pathology laboratories themselves and associated industry bodies and professional associations) and a consumer perspective (patients who are having samples collected for testing) of pathology testing services. The fundamental difference between the industry and consumer perspectives is manifest in their primary focus in respect to quality and safety concerns.

In terms of industry's quality and safety concern focus, industry is primarily (though not exclusively) concentrated on the quality of the pathology specimen to be tested. Problems occurring during pathology collection processes are identified in a number of ways. Most commonly a specimen is rejected at the laboratory's specimen reception as it has been incorrectly labelled, contaminated, collected into an inappropriate anti-coagulant, or the sample quality is compromised, for example, haemolysed or clotted samples. Consumers on the other hand primarily focus on the safety and comfort of the patient, although they also have an interest in the quality of the sample. This tends to translate into a stronger emphasis on the competence of the pathology collector. While both industry and consumers consider the process, for consumers this is more about the degree of confidence and safety in the way the collector relates to the patient than the quality of the sample obtained.

The differences in perspective between employers and consumers mean the different competencies of pathology collectors are not equally valued. As an example, a collector with excellent communication skills and a high customer focus made not be as technically competent, but be seen by the patient as a 'better' collector. Blood collection can be stressful for patients and so the importance of good customer and communication skills to reassure the patient cannot be over-emphasised and is a core requirement in a training program. Possessing a qualification is not always well correlated with actual performance, however it can be a way to reassure consumers that pathology collectors are sufficiently competent. The CHF [8] and consumer focus group discussions identified that consumers were concerned that credentialing of pathology collectors is not mandatory. Case study employers seemed as a whole to be responding to market preferences and were focused on all pathology collection staff possessing a qualification. This is reflected in trends in enrolment and completions statistics of the Certificate III and IV Pathology courses obtained from the National Centre for Vocational Education Research [personal communication]. The growth in Certificate III enrolments and course completions over the five-year period 2008-2012 has been a significant 6% per annum.

Parts of the Australian pathology collection workforce can be considered highly competent by world standards. The preferred qualification of industry, the Certificate III in Pathology, maps reasonably well against the competency guidelines of National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), a United States-based organisation which a literature search for this study revealed to be world best practice. [16] The Certificate III in Pathology is most similar to the NAACLS set of competencies than any other set of comparable competency standards, covering nearly all the main areas of competence in the NAACLS standards at least to some degree. The areas of NAACLS competence that the Certificate III arguably covers less well are the theory elements relating to the anatomy and physiology of body systems and pathologic conditions associated with the body systems. Some of the non-technical areas of competence identified in the benchmark NAACLS standards, such as communication skills, confidentiality, professional behaviour and customer service skills generally, are afforded more limited attention in the Certificate III competencies. Case study employers and consumers in the results of this study also identify these deficiencies.

A significant proportion of the workforce (estimated to be between a third and a half) remains unqualified. Regulatory reforms in relation to existing accreditation processes (NPAAC Guidelines for Approved Pathology Collection Centres (Third Edition 2013)) that take into account the distribution of the pathology collection workforce in regard to relevant possession of qualifications need to be considered.

Of even potentially greater concern is that a significant proportion of collections are undertaken by non-specialist pathology collectors – general practitioners, practice nurses, Aboriginal health workers, medical scientists, interns and nurses in specific hospital wards and emergency departments. Australian Institute of Health Innovation/ KIMMS data indicates this part of the collection workforce contributes up to three times the haemolysis rates of laboratory phlebotomists. (17) Management to reduce error in pathology results from this source would need to consider establishing minimum competence requirements for any collection work (for instance competence in at least a single unit of the Certificate III in Pathology qualification such as 'HLTPAT306C Perform blood collection'). Alternatively, 'specialist' pathology collection workers (who remain a relatively low cost source of labour) could be more widely deployed to ensure coverage especially in hospitals of currently poorly covered services.

Conclusion

It is the conclusion of this study that the most effective pathway to best practice pathology collection requires:

- Strong policies and procedures that define how pathology samples are to be collected, stored and transported;
- Recognition of the patient as a customer and inclusion of customer service competencies in the core training and ongoing assessment of collectors; and
- A pathology collection workforce that is competent and presents to consumers with a credible qualification and in a professional manner.

Many of the employers interviewed in the course of this study concluded that increasingly improved training was key to progressing towards best practice pathology collection. They advocated universal adoption of the Certificate III in Pathology as the minimum level of training that is required as preparation for safe pathology collection practice. A majority of pathology laboratories, both public and private, were attempting to set this benchmark unilaterally as the minimum for recruitment in their own organisations, although there remain many unqualified pathology collectors in pathology services.

In addition to the training of (specialist) pathology collectors, other individuals who collect pathology specimens (nurses, general practitioners, Aboriginal Health Workers, etc.) in lieu of pathology collectors need to have received minimum levels of training. A single unit of the Certificate III in Pathology qualification — 'HLTPAT306C Perform blood collection' — is considered sufficient and there is no compelling reason why training for this unit needed to be anything other than an on-the-job, in-house training process.

Competing Interests

The authors declares that they have no competing interests.

References

1. Plebani M. Errors in clinical laboratories or errors in laboratory medicine? Clin Chem Lab Med. 2006;44(6):750–759.
2. Department of Human Services. 'Medicare Group Reports' website. Commonwealth Government of Australia. Available from: https://www.medicareaustralia.gov.au/statistics/mbs_group.shtml
3. Dale JC, Novis DA. Outpatient phlebotomy success and reasons for specimen rejection. Arch Pathol Lab Med. 2002;126:416–419.
4. Bonini P, Plebani M, Ceriotti F, Rubboli F. Errors in laboratory medicine. Clinical Chemistry. 2002;48:5691–698.
5. Lippi G, Guidi GC, Mattiuzzi C, Plebani M. Pre-analytical variability: the dark side of the moon in laboratory testing. Clin Chem Lab Med. 2006;44(4):358–365.
6. Bayley K. Pre-analytical errors: make a difference. WA: Path West Laboratory Medicine; 2011. Available from: http://www.rcpaqap.com.au/kimms/gendocs/uploadedfiles/Pre-analytical%20Errors%20-%20Make%20a%20difference%202011.pdf
7. National Pathology Accreditation Advisory Council (NPAAC) Guidelines for approved pathology collection centres (Requirements for Medical Pathology Specimen Collection). 2nd Edition. NPAAC; 2012. Available from: www.health.gov.au/internet/main/publishing.nsf/Content/health-npaac-publication.htm
8. Consumers Health Forum of Australia (CHF). Quality Use of Pathology Consumer Consultation Project. CHF; 2010.
9. Pilbeam V, Badrick T, Ridoutt L. Best practice pathology collection. Canberra: Department of Health; 2013.
10. World Health Organization (WHO). WHO guidelines on drawing blood: best practices in phlebotomy. Geneva: WHO; 2010.
11. Lavery I, Ingram P. Venepuncture: best practice. Nursing Standard. 2005;19(49):55-65.
12. Maxwell H. Updated phlebotomy practices: procedures for the collection of diagnostic blood specimens by venipuncture. Available from: http://96.36.117.186/NewsLetter.pdf
13. Ridoutt L, Pilbeam V, Bagnulo J, Graham D. Career structures and pathways for the scientific workforce in medical pathology laboratories – final project report for the Quality Use of Pathology Program. Canberra: Department of Health and Ageing; 2011.
14. Australian Bureau of Statistics. Population Census Data (2006). Available from: http://www.abs.gov.au/census
15. Dale JC, Howanitz PJ. Patient satisfaction with phlebotomy service data analysis and critique. College of American Pathologists. 1995.
16. National Accrediting Agency for Clinical Laboratory Science (NAACLS) The Standards of Approved Educational Programs for the Phlebotomist. US: NAACLS; 2001. Available from: http://www.naacls.org/PDFviewer.asp?mainUrl=/docs/standards_phleb.pdf
17. Australian Institute of Health Innovation. A benchmark study of the frequency and variability of haemolysis reporting across pathology laboratories. Sydney: Macquarie University; 2015. ISBN: 978-1-74138-432-1.

Are Clinical Registries Actually Used? The Level of Medical Staff Participation in Clinical Registries and Reporting within a Major Tertiary Teaching Hospital

A Dwyer and J McNeil

Abstract

Clinical Registries are established to provide a clinically credible means for monitoring and benchmarking healthcare processes and outcomes, to identify areas for improvement, and drive strategies for improving patient care. Clinical Registries are used to assess changes in clinical practice, appropriateness of care and health outcomes over time. The American Heart Association Policy Statement in April 2011 called for expanding the application for existing and future Clinical Registries, with well-designed Clinical Registry programs. Concurrently, in Australia, and similarly within the United States and United Kingdom, there has been an increased focus on performance measurement for quality and patient safety. Within Victoria, the Victorian Clinical Governance Policy Framework outlines clinical effectiveness as one of the four domains of Clinical Governance

As Clinical Registries evaluate effectiveness and safety of patient care by measuring patient outcomes compared with peers, the use of Clinical Registries data to improve a health service's quality of care seems intuitive. A mixed methods approach was utilised, involving (1) semi-structured interviews and (2) documentation audit in this study conducted at Austin Health, a major tertiary teaching hospital in North-Eastern metropolitan Melbourne, affiliated with the University of Melbourne and various research institutes within Austin LifeSciences.

Although many studies have highlighted the benefits of data collected via individual Clinical Registries, [5,6] the level of voluntary medical staff participation in Clinical Registries at a health service level is yet to be established. The aim of this study was to document the level of medical staff involvement for Clinical Registries within a major tertiary teaching hospital, and the level of reporting into Quality Committees within the organisation.

This study demonstrates that along with a very high level of medical staff participation in Clinical Registries, there is a lack of systematic reporting of Registries data into quality committees beyond unit level, and utilisation of such data to reflect upon practice and drive quality improvement.

Abbreviations: CREPS – Centre for Excellence in Patient Safety; CSU – Clinical Services Unit; HOU – Heads of Unit; VASM – Victorian Audit of Surgical Mortality.

Key words: Clinical Registries; benchmarks; improving patient care; clinical practice; outcomes.

Alison Dwyer
Clinical Governance
Austin Health
Heidelberg, Victoria, Australia.

John McNeil
Department of Epidemiology and Preventative Medicine
Monash University
Melbourne, Victoria, Australia.

Correspondence:
alisonjle@gmail.com

Background

Clinical Registries are established to 'measure, monitor and identify outcomes through the peer-review process, with the aim to improve patient care'. [1] Registries provide a clinically credible means for monitoring and benchmarking healthcare processes and outcomes, [2] identify areas for improvement, and drive strategies for improving patient care. In addition, Clinical Registries are used to assess changes in clinical practice, appropriateness of care and health outcomes over time. [3] The American Heart Association Policy Statement in

April 2011 called for expanding the application for existing and future Clinical Registries, with well-designed Clinical Registry programs providing 'important mechanisms to monitor patterns of care, evaluate healthcare effectiveness and safety, and improve clinical outcomes'. [4]

Although many studies have highlighted the benefits of data collected via individual Clinical Registries, [5,6] the level of voluntary medical staff participation in Clinical Registries at a health service level is yet to be established.

Concurrently, in Australia, and similarly within the United States and United Kingdom, there has been an increased focus on performance measurement for quality and patient safety. Within Victoria, the Victorian Clinical Governance Policy Framework outlines clinical effectiveness as one of the four domains of Clinical Governance, [7] including:

- Clinical care delivery is evidence-based
- Standards of clinical care are clearly articulated and communicated
- Performance of clinical care processes and clinical outcomes are measures
- Clinical performance measures, peer review and clinical audit are used to evaluate and improve performance
- Quality improvement activities are reviewed externally.

As Clinical Registries evaluate effectiveness and safety of patient care by measuring patient outcomes compared with peers, the use of Clinical Registries data to improve a health service's quality of care seems intuitive.

Definitions

Clinical quality registries are organisations that systematically monitor the quality (appropriateness and effectiveness) of healthcare, within specific clinical domains, by routinely collecting, analysing and reporting health-related information. The information is used to identify outcome benchmarks, significant outcome variance, and inform improvements in healthcare quality. [8] The Australian Commission on Safety and Quality in Healthcare has defined a Framework, Strategic and Operating Principles, and Technical Guidelines for establishing Clinical Registries within Australia. [8]

Clinical Registries usually encompass patients treated by a single medical specialty group (e.g. Melbourne Interventional Cardiology Group involves patients treated by credentialed Cardiologists only), and hence collation of information is direct from the treating clinicians to the Registry Information in Clinical Registries is captured on an ongoing basis from a defined population. Clinical Registries provide the most suitable and accurate method of providing monitoring and benchmark data and provide the greatest potential to improve healthcare performance across institutions and providers. [9] The focus of Clinical Registries is to capture data that reflects 'real-world' clinical practice in large patient populations. [6] The data from Clinical Registries 'do not replace the need for traditional randomised controlled trials, rather registries and trials are complementary approaches'. [6]

The relationship between the Clinical Registries and timely, regular feedback to clinicians is essential. The Operating Principles and Technical Standards for Australian Clinical Quality Registries clearly outline the requirement that registries 'must report without delay on risk-adjusted outcome analyses to institutions and clinicians', and ensure a 'publicly-accessible aggregated annual report' is available, detailing 'clinical and corporate findings'. [10]

Austin Health context

Austin Health is a major tertiary teaching hospital in north-eastern metropolitan Melbourne, affiliated with the University of Melbourne and various research institutes within Austin LifeSciences. Austin Health provides the full range of adult acute medical, surgical, critical care and diagnostic specialties (excluding Gynaecology), sub-acute specialties and general paediatric specialties. Austin Health is world-renowned for its research and specialist work in cancer, liver transplantation, spinal cord injuries, neurology, endocrinology, mental health and rehabilitation. Austin Health encompasses Austin Hospital Heidelberg, Repatriation Hospital Heidelberg, and Royal Talbot Repatriation Centre. During 2008-09, its 6,402 staff treated a record 89,668 inpatients and 155,538 outpatients.

Austin Health established a structure for Quality and Safety Committees, to assist with governance and monitoring patient care across the organisation. The Committee structure includes:

- **Tier 1 - Board Quality and Safety.** This is the highest committee level of governance oversight for Quality and Safety, involving Board members and Executive management. The Board committee discusses strategic quality issues related to whole of organisation.
- **Tier 2 - Executive-level Safety, Quality and Risk Committee.** This is the second highest committee level of governance, involving Executive management, senior clinical and non-clinical leaders throughout the organisation. The Executive Committee discusses operational quality issues relating to whole of organisation.

- **Tier 3 – Quality Committees** dedicated to specific safety areas (such as Falls, Medications, Deteriorating Patient). These committees involve senior clinical leaders with specific quality skills relevant to the area.
- **Tier 4 – Quality Committees** dedicated to specific areas within the health service (such as Surgical Services, Medical Services, Perioperative Services). These multi-disciplinary committees oversee quality issues related to specific areas, with representation from multiple units and medical, nursing, allied health colleagues.

Aim

To document the level of medical staff involvement for Clinical Registries within a major tertiary teaching hospital, and the level of reporting into Quality Committees within the organisation.

Methodology

A mixed methods approach was utilised, involving (1) semi-structured interviews and (2) documentation audit.

(1) Semi-structured interviews were conducted with clinicians in medical leadership roles within Austin Health, including Medical Clinical Service Units (CSU) Directors, and Heads of Units (HOU). Interviews were conducted throughout August 2011. HOU were asked to comment as to the level of engagement within the relevant Clinical Registry in a 3 point Likert scale (no contribution, partial contribution, full contribution). A list of registries maintained by the Centre for Research Excellence in Patient Safety (CREPS) was used for comparison. [11] In those areas that did not contribute in full, HOU were asked to briefly comment on the reasons behind the limited contribution. In addition, HOU were also asked to comment if they undertook any other forms of external benchmarking of patient outcomes beyond the CREPS list.

Participants were contacted via initial email to Medical CSU Directors with follow-up phone call. For those Units where the Medical CSU Director could not provide comment on the list of Clinical Registries, a further email (with follow up phone call if required) to relevant HOU was undertaken. In addition, any HOU identified by the Medical CSU Director with known additional benchmarking beyond the list were also approached (email then follow up phone call) to clarify the nature of the patient outcome benchmarking.

(2) Documentation audit of Clinical Registry Reporting within Quality Committees. A Documentation Audit of the minutes of all Austin Health Quality Committees for a 12 month period (September 2010 to August 2011) was conducted for documentation of reporting of Clinical Registry information, including:

(a) Presentation of data itself within the committee

(b) Analysis of the data to inform quality improvement activities

(c) Discussions of the framework for utilising Clinical Registry data.

Results

Semi structures interviews for medical staff engagement in Clinical Registries

All Medical Directors of CSUs (seven) responded to the survey. An additional 22 HOU were approached via email or phone call. All 29 participants responded.

Austin Health Medical Units contribute in full to all but one of the benchmarked list of Clinical Registries (Table 1) that are relevant for the organisation. The Clinical Registries encompassed a broad range of surgical, medical, critical care, subacute and psychiatry specialties, and involved a broad representation of clinical conditions/procedural groups and patient cohorts. In addition, it was identified that further peer-reviewed processes for clinical audit with external benchmarking of patient outcomes were undertaken, including Department of Health initiatives, local collaboration with other health services, and unit initiated benchmarking amongst individual clinicians from outside the health service (listed with ** in Table 1). Table 2 lists the Clinical Registries that are not relevant for Austin Health.

Of note, there were a number of medical specialties where no Clinical Registry or external benchmarking opportunity currently exist (Endocrinology, General Medicine, Paediatric Medicine, Respiratory Medicine, Spinal Unit, Radiology, Aged Care).

Documentation Audit of reporting of Clinical Governance Framework

All tier 1-4 Clinical Governance Committees minutes were reviewed from September 2010 to August 2011. In total, 14 committees were reviewed. Findings included (Figure 1):

Tier 1 Committee level

Clinical Registry information was discussed at Tier 1 level (Board Clinical Safety and Quality Committee) on eight separate occasions over six meetings. This included:

- Presentation of Annual Audit results for Anaesthetics as part of Victorian Consultative Council for Anaesthetic Morbidity and Mortality, to identify patient outcomes compared to peers Presentation of Annual Renal Audit including data from Australian and New Zealand Dialysis and Transplant Registry (ANZDATA) report.

Table 1: Comparison of Medical Specialties within the organisation, clinical registries, and Quality Committee Reporting

MEDICAL SPECIALTIES WITHIN THE ORGANISATION	CLINICAL REGISTRY RELEVANT TO THE SPECIALTY	QUALITY COMMITTEE RELEVANT TO THE SPECIALTY
Surgical Specialties	Victorian Surgical Consultative Council** Victorian Audit of Surgical Mortality (VASM)** ACCORD Comprehensive Cancer Patient Database (Various Surgical Oncology Units with tumour streams)	Surgical Audit and Review Committee (all surgical specialties)
• Cardiac Surgery	Australian Society of Cardiothoracic Surgeons Database Project (ASCTS)	
• General Surgery (4 units)	Australian and New Zealand Liver Transplantation Registry (ANZLTR) Bi-National Colorectal Cancer Audit (BCCA) National Bowel Cancer Screening Program	
• Maxillofacial Surgery		
• Neurosurgery		
• Orthopaedic Surgery	Australian Orthopaedic Association (AOA) National Joint Replacement Register (NJRR) Victorian Orthopaedic Trauma Outcomes Registry (VOTOR)	
• Otolaryngology Surgery		
• Plastic Surgery		
• Thoracic Surgery	Victorian Lung Cancer Registry** Thoracic Surgery Database** (benchmarked with St Vincents Health)	
• Urology	Prostate Cancer Clinical Quality Registry	
• Vascular Surgery	Australasian Vascular Audit	
Medical specialties		
• Cardiology	Melbourne Interventional Group (MIG) Interventional Cardiology Registry (PCI)	Medical Outcomes and Review Committee (all medical specialties)
• Dermatology	Melbourne Melanoma Collaborative**	
• Endocrinology		
• Gastroenterology	National Bowel Cancer Screening Program	
• General Medicine (5 units)		
• Infectious Diseases	National Creutzfeld Jacob Disease Victorian Infection Control Nosocomial Infection Surveillance System (VICNISS)	Infection Control Committee
• Nephrology	Australian and New Zealand Dialysis and Transplantation Registry (ANZDATA)	
• Neurology	Australian Motor Neuron Disease Registry (AMNDR) Australian Stroke Clinical Registry (AuSCR)	
• Oncology	ACCORD Comprehensive Cancer Patient Database (Oncology) Bi-National Colorectal Cancer Audit (BCCA) National Breast Cancer Audit (NBCA) Victorian Cancer Registry**	
• Palliative Care	Palliative Care Outcomes Collaboration** Palliative Care Consult Services State-wide Minimum dataset**	
• Paediatric Medicine		
• Respiratory Medicine		
• Rheumatology	Australian Rheumatology Association Database (ARAD)	
• Spinal		

Table 1: Comparison of Medical Specialties within the organisation, clinical registries, and Quality Committee Reporting *continued*

MEDICAL SPECIALTIES WITHIN THE ORGANISATION	CLINICAL REGISTRY RELEVANT TO THE SPECIALTY	QUALITY COMMITTEE RELEVANT TO THE SPECIALTY
Critical care specialties • Anaesthesia • Emergency Medicine • Intensive Care • Organ Donation Service	Victorian Consultative Council for Anaesthetic Morbidity and Mortality (VCCAMM)** National Trauma Registry Consortium (NTRC) Victoria State Trauma Outcomes Registry and Monitoring (VSTORM) Group Australian and New Zealand Intensive Care Unit Society (ANZICS CORE) Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM)** – as organization provides Intensive Care services for collocated Maternity Hospital Australian and New Zealand Organ Donation Registry (ANZOD)	Operating Suite Quality Committee (for Anaesthesia)
Diagnostic specialties • Pathology • Radiology	National Cytology Registry	
Subacute specialties • Rehabilitation • Aged Care	Australasian Rehabilitation Outcomes Centre (AROC)	
Mental Health	Victorian Mental Health Client Management Interface** Mental Health Mortality Registry**	Mental Health Safety Quality and Risk Committee

*** benchmarking opportunities not listed with Centre for Research Excellence in Patient Safety*

- Victorian Infection Control Nosocomial Infection Surveillance System (VICNISS) integration into the organisation's suite of clinical indicators was recommended.
- Mental Health Performance Indicators presented regularly at Board Clinical Safety and Quality Committee includes part of Victorian Mental Health Client Management Interface, and Mental Health Mortality Register.
- The framework for integrating Clinical Registries data into the organisation's clinical governance system was discussed on four occasions.

Tier 2 Committee level

Integrating Clinical Registry information into the quality committee structures was also discussed on one occasion at the Safety Quality and Risk Committee.

Tier 3 Committee level

VICNISS data is reviewed monthly within the Infection Control Committee (Tier 3).

No Registry data was discussed at Clinical Outcomes Review Committee, Drug and Therapeutics Committee, Blood Products Committee or Clinical Policies and Procedures Committee.

Tier 4 Committee level

All deaths within surgery for the Victorian Audit of Surgical Mortality (VASM) are reviewed monthly within the Surgical Audit and Review Committee. Seclusion and restraint benchmarking data is reviewed within three meetings of the Mental Health Safety Quality and Risk Committee.

No Registry data was discussed at the Operating Suite Quality Assurance Committee, New Technologies and Clinical Practice Committee, Resuscitation Committee, Medical Outcomes Review Committee, or Clinical Review Committee.

Table 2: List of clinical registries that are not applicable for the organisation

CLINICAL REGISTRY	DETAILS OF PATIENT GROUP, SURGICAL PROCEDURE OR HEALTH RESOURCE INVOLVED	CONTRIBUTION TO REGISTRY (OR COMMENTS)
Australian and New Zealand Cardiothoracic Organ Transplantation Registry (ANZCOTR)	All individuals who have undergone a heart, a single lung, a double lung or heart lung block transplant operation (with or without any additional organs e.g. kidney, liver, pancreas).	Not relevant for organization ad no heart transplants undertaken.
Australian Cardiac Procedures Registry (ACPR)	All patients who undergo a cardiac surgery, RCI or device procedure at participating hospitals. Ended on 30th November 2009. A number of sites are still collecting data.	Ceased November 2009.
Australian Corneal Graft Registry	All individuals who have undergone the surgical procedure of penetrating or lamellar corneal transplantation, anywhere in Australia.	Not relevant for organisation as no corneal transplants undertaken.
Australian Cystic Fibrosis Data Registry	Persons diagnosed with Cystic Fibrosis whose condition is managed at a specialist CF treatment centre in an Australian Hospital.	Not relevant for organisation as no Cystic Fibrosis patients managed at organisation.
Bi-national Burns Registry (Bi-NBR)	All patients admitted to a Burns Unit with any burn.	Not relevant for organization as not a designated Burns unit.
Breast Screen Victoria	Any woman over the age of 40 years who has a mammography in the Breast Screen Australia program.	No, as the organization is not part of Breast Screen Victoria. Peer review via Breast Multidisciplinary meetings. (Radiology).
Centre of National Research on Disability and Rehabilitation Medicine (CONROD)	All Trauma patients, within Queensland.	Not relevant for organisation.
Victorian Cardiac Arrest Registry	The Registry captures all cardiac arrests attended by metropolitan and rural ambulance across Victoria.	Not relevant as out of hospital arrests.

Discussion and recommendations

Methodology strengths and limitations

Mixed methods analysis provides the ability to identity Clinical Registries in which the clinicians participated, and subsequently link whether these registries were discussed at Quality Committee level. High respondent rates were achieved through semi-structured interviews. The analysis also identified a number of medical specialties that did not have any relevant registries.

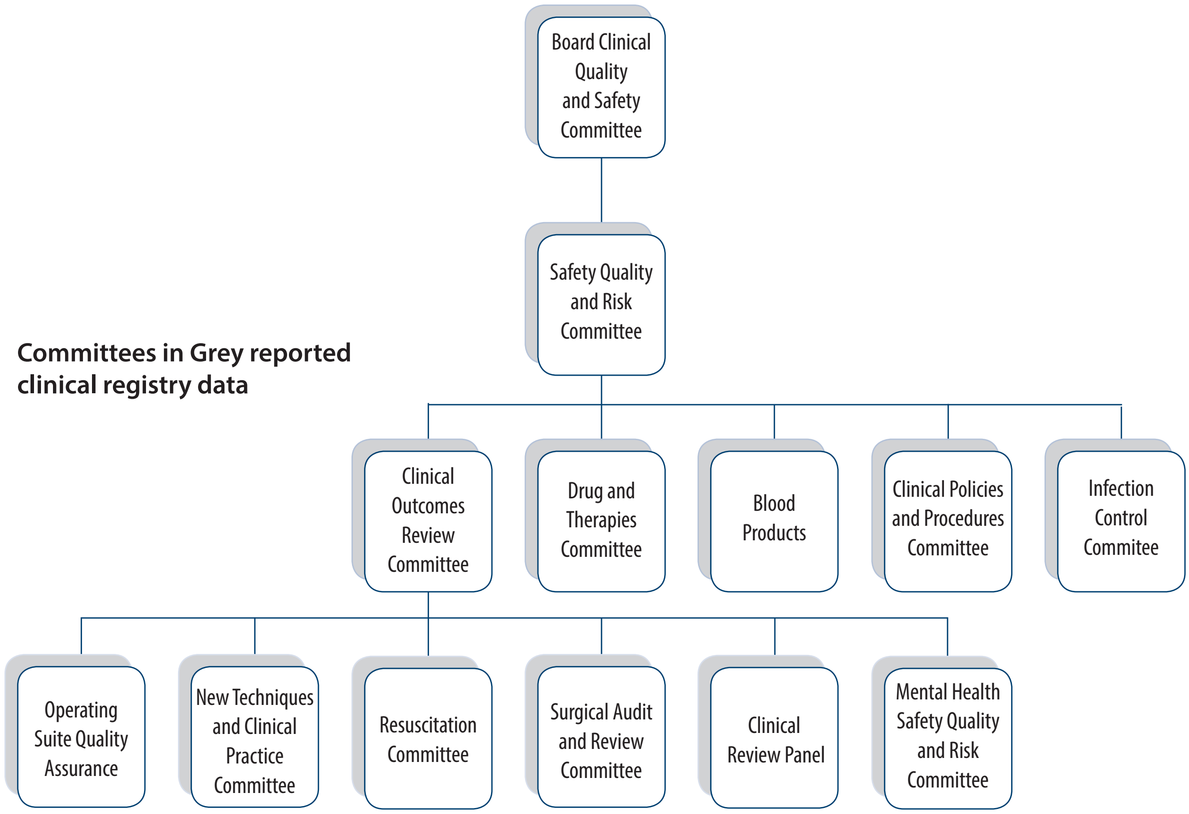
Limitations of the study include the reliance on the documentation within committee minutes for accurate discussions of Registry data.

The study did not include educational forums (e.g. Grand Rounds) within its scope. The Division of Surgery holds annual Surgical Forums, where each surgical unit presents its annual clinical audit data. This is presented to the broader organisation via the Division of Surgery. No formal minutes occur for these presentations, which formally sit underneath the governance of Surgical Audit and Review Committee. A similar educational opportunity occurs within the Division of Medicine Grand Round, with units presenting annually on a rotating weekly basis. Clinical Registry data may be included in these forums, however no formal minutes occur for these presentations.

The study did not include Clinical Trials or Research studies within its scope. Both of these areas would have some ability to measure patient outcomes against other peer organisations, within a trial or research governance framework.

Finally, the study did not include administrative dataset reporting within its scope, including Victorian Admitted Episodes Dataset reporting to the Department of Health Victoria. [12]

Figure 1: Documentation Audit of reporting of Clinical Registries within Quality Committees



Discussion of comparison to other studies

Clinical Registries are extensively utilised within a tertiary health service as a means of benchmarking patient outcome data with peers and the larger real-world population of patients. Registries allow for timely feedback to clinicians on real-world patients and allow analysis to inform improvements to patient care. We identified almost universal participation in Clinical Registries that were relevant for the organisation. High participation rates were similar to Retegan and colleagues of the VASM independent review, through a survey of 257 individual stakeholders with a 95% agreed participation rate amongst Victorian Fellows of the Royal Australasian College of Surgeons. [13] The analysis of VASM reported cases has also lead to further understanding of cross-specialty differences with clinical management issues. [1] High participation rates were also identified in the Australian and New Zealand Intensive Care Society Centre for Outcomes and Resource Evaluation Registries, with 197 adult ICUs (75%) of Australian ICUs contributing to the Registry. [14]

We also identified a number of medical specialties that did not have formal Clinical Registries, including Endocrinology and General Medicine. The National (insulin-treated) Diabetes Register, [15] managed by the Australian Institute of Health and Welfare, collects information about new cases of insulin-treated diabetes, and managed by the Diabetes Services Scheme, however there is predominantly a register for incidence of diabetes, not clinical outcomes. There are a number of best-practice diabetes management guidelines, available on the Australian Diabetes Society, [16] providing a hypothetical potential to link both via a Clinical Registry. Diabetes Registries have been established in other countries, with the German DiMelli study establishing a diabetes incidence cohort Registry in 2010, [17] which has already generated an increased understanding of the etiology of diabetes, [18] and similarly with the Saudi Arabian National Diabetes Register. [19] Nordic countries are attempting to ensure comparable variables across registries for diabetes, to improve the quality of care for children with diabetes. [20]

International literature in the United States has also identified enhanced understanding of heart failure characteristics, management, outcomes and their predictors through analysis of Heart Failure registries. [21] Lara et al's 2011 study of respiratory disease registries in Spain outlined a number of disease-specific registries that have lead to advancements in the management of specific respiratory conditions. [22] An opportunity therefore arises for Australian registries within these general medical conditions.

Implications for practice

There is significant potential to improve patient care through the timely feedback of clinically relevant information to clinicians' data within local health services. The Surgical Quality Committees reviewed within our organisation had well-established mechanisms for participating in Clinical Registries, and ensuring the data is regularly reviewed within the Surgical Quality Committee beyond unit level within a culture of openness and transparency beyond unit level. As with the learnings across surgical specialties that are arising from analysis at VASM level, [1] cross specialty trends of patient cohorts, treatments and patient outcomes can be realised at the organisation level by sharing of Registry data between specialties.

At present within our organisation, the sharing of broader learnings across physician specialties is lacking (including Nephrology, Cardiology, Emergency, Intensive Care, Anaesthetics) due to the lack of reporting of Registry data beyond Unit level.

As healthcare systems re-focus reform efforts on cost-effectiveness, particularly by evaluating patient outcomes relative to costs, measuring patient outcomes will become increasingly important. An international study of thirteen registries in five countries suggests, 'well managed registries enable medical professionals to engage in continuous learning and to identify and share best clinical practices'. [23]

There is also a corresponding increase in exploring performance measures for patient outcomes derived from routinely recorded administrative data sets, such as The Classification of Hospital Acquired Diagnoses (CHADx), [24] and Hospital Standardised Mortality Ratios [25] within Australia, and within Medicare in the United States. However there are varying opinions of the validity and applicability of such data sets and in general their credibility with clinicians lags substantially behind that of Registry data.

Implications for further study

To enhance clinician participation in Clinical Registries, it would be valuable to ascertain the factors affecting level of participation to Clinical Registry, particularly any barriers for those areas that were not contributing in full (one Registry). In addition, further study of clinicians' perceptions of the variance in reporting within quality committee structures would be beneficial, to ascertain the factors enhancing surgical reporting, and those barriers to other specialties who do not currently report their Registry data beyond their unit level. In our austere healthcare environments, an economic evaluation of the resource implications for maintaining registries at an organisation would be useful.

Conclusions

This study demonstrates that along with a very high level of medical staff participation in Clinical Registries, there is a lack of systematic reporting of Registries data into quality committees beyond unit level, and utilisation of such data to reflect upon practice and drive quality improvement. Cross specialty trends of patient cohorts, treatments and patient outcomes could be realised at the organisation level by sharing of Registry data between specialties.

Competing interests

The authors declare that they have no competing interests.

References

1. Vinluan J, Retegan C, Chen A, Beiles CB. Clinical management issues vary by specialty in the Victorian Audit of Surgical Mortality: a retrospective observational study. BMJ Open. 2014;4:e005554
2. Evans SM, Scott IA, Johnson NP, Cameron PA, McNeil JJ. Development of clinical-quality registries in Australia: the way forward, Med J Aust. 2011;194(7):360-363.
3 Grace BS, Clayton P, McDonald SP. Increases in renal replacement therapy in Australia and New Zealand: understanding trends in diabetic nephropathy. Nephrology. 2012;17(1):76-84.
4. Bufalino VJ, Masoudi FA, Stranne SK, Horton K, Albert NM, Beam C, et al. The American Heart Association's Recommendations for Expanding and Applications of Existing and Future Clinical Registries, a Policy Statement from the American Heart Association. Circulation. 2011;123:2167-2179.
5. Ademi Z, Reid CM, Hollingsworth B, Stoelwinder J, Steg PG, Bhatt DL, Vale M, Liew D; Reach Registry Investigators. Cost-effectiveness of optimizing use of statins in Australia: using outpatient data from the REACH Registry. Clin Ther. 2011; 33(10):1456-65. Epub 2011 Oct 7.
6. Moran JL, Solomon PJ; for the ANZICS Centre for Outcome and Resource Evaluation (CORE) of the Australian and New Zealand Intensive Care Society (ANZICS). Mortality and intensive care volume in ventilated patients from 1995 to 2009 in the Australian and New Zealand binational adult patient intensive care database.* Crit Care Med. 2012;40(3):800-812.
7. Victorian Government Department of Human Services. Victorian Clinical Governance Policy Framework. Melbourne: DHS; 2013.
8. Australian Commission Safety and Quality in HealthCare. What are clinical quality registries? [accessed 2015, Nov 6]. Available from: http://www.safetyandquality.gov.au/our-work/information-strategy/clinical-quality-registries/what-are-clinical-quality-registries/
9. Centre of Research Excellence in Patient Safety. Clinical Registries [accessed 2012 March 18; updated 2015 June 13]. Available from: http://www.crepatientsafety.org.au/registries/
10. Australian Commission on Safety and Quality in Healthcare. Operating Principles for Australian Clinical Quality Registries [accessed 2015 Nov 6]. Available from: http://www.safetyandquality.gov.au/wp-content/uploads/2012/03/Operating-Principles-for-Australian-Clinical-Quality-Registries-Brochure-2011.pdf,
11. What CQRs exist in Australia? Centre for Research Excellence in Patient Safety, Monash University [accessed 2010 Nov 4]. Available from: http://www.registries.org.au/cqr.html,
12. Health Data Standards and Systems, Department of Health Victoria. Victorian Admitted Episodes DataSet (VAED) [accessed 2014, Aug 1]. Available from: www.health.vic.gov.au/hdss/vaed/

13. Retegan C, Russell C, Harriss D, Andrianopoulos N, Beiles B. Evaluating the value and impact of the Victorian Audit of Surgical Mortality. ANZJSurg. 2013;83:724-728.
14. ANZICS Centre for Outcome and Resource Evaluation. Annual Report 2012-2013. Melbourne: ANZICS; 2013.
15. Australian Institute of Health and Welfare. National (insulin treated) Diabetes Register [accessed 2014, Aug 1]. Available from: http://www.aihw.gov.au/national-diabetes-register.
16. Australian Diabetes Society. Position Statements and Guidelines [accessed 2014, Aug 1]. Available from: http://diabetessociety.com.au/position-statements.asp
17. Thumer L, Adler K, Bonifacio E, Hofmann F, Keller M, Milz C, Munte A, Ziegler AG. German new onset diabetes in the young incident cohort study: DiMelli study design and first year results. Rev Diabet Stud. 2010;7(3):202-8.
18. Warncke K, Krasmann M, Puff R, Dunstheimer D, Ziegler AG, Beyerlein A. Does diabetes appear in distinct phenotypes in young people? Results of the diabetes mellitus incident cohort Registry (DiMelli). Plos One. 2013;4;8(9):e74339.
19. Al-Rubeaan KA, Yousef AM, Subhani SN, Ahmad NA, Al-Sharquawi AH, Ibrahim HM. A Web-based interactive diabetes Registry for healthcare management and planning in Saudi Arabia. J Med Internet Res. 2013;9;15(9):e202.
20. Hanberger L, Dirkebaek N, Bjarnason R, Drivvoll AK, Johansen A, Skrivarhaug T, Thorsson AV, Samuelsson U. Childhood diabetes in the Nordic countries: a comparison of quality registries. J Diabetes Sci Technol. 2013;(Apr)17.
21. Ambrosy AP, Fonarow GC, Butler J, Chioncel O, Greene SJ, et al. The global health and economic burden of hospitalisations for heart failure: lessons learned from hospitalized heart failure registries, J Am Coll Cardiol. 2014;(1)63(12):1123-33.
22. Lara B, Morales P, Blanco I, Vendrall M, DeGracia Roldan J, Monreal, et al. Respiratory Disease Registries in Spain: fundamentals and organisation. Arch Bronconeumol. 2011;47(8):389-96.
23. Larsson S, Lawyer P, Garellick G, Lindahl B, Lundrstrom M. Use of 13 Disease registries in 5 countries demonstrates the potential to use outcome data to improve healthcare's value. Health Affairs. 2012;31(1):220-227.
24. Jackson TJ, Michel JL, Roberts RF, Jorn CM, Wakefield JG. A classification of hospital acquired diagnoses for use with routine hospital data. Med J Aust. 2009;191: 544-548.
25. Scott IA, Brand CA, Phelps GE, Barker AL, Cameron PA. Using hospital standardized mortality ratios to assess quality of care – proceed with extreme caution, Med J Aust. 2011;194:645-648.
26. Koch CG, Li L, Hixson E, Tang A, Phillips S, Henderson JM. What are the real rates of post operative complications: elucidating inconsistencies between administrative and clinical data sources, J Am Coll Surg. 2012 Mar 13 [Epub ahead of print]

RESEARCH ARTICLE

Using Linked Lung Cancer Registry and Hospital Data for Guiding Health Service Improvement

D Roder, H You, D Baker, R Walton, B McCaughan, S Aranda and D Currow

Abstract

Objective: To use linked NSW Cancer Registry and hospital lung cancer (LC) data for raising discussion points on how to improve outcomes.

Design: Historical cohort – cases diagnosed in 2003-2007.

Setting: New South Wales, Australia

Outcome Measures: Relative odds (OR) of localised disease and resection of non-small cases (NSCLC) using multiple logistic regression. Comparisons of risk of NSCLC death using competing risk regression.

Findings:

(1) Older patients have fewer resections of localised NSCLC [adjusted OR 95% CLs; 80+Vs <60 years; 0.20 (0.14, 0.28)]. Cases with co-morbidity have fewer resections [adjusted OR, 0.74 (0.61, 0.90)] and have more conservative resections. Question: Is there the best balance between resection and avoiding surgery to accommodate frailty and co-morbidity?

(2) Compared with public patients, the health insured: have higher odds of localised LC [adjusted OR, 1.23 (1.12, 1.35] and resection for localised NSCLC [adjusted OR, 2.08 (1.70, 2.54)]; are more likely to have lobectomies than wedge/segmental resections ($p<0.001$); and have a lower risk of LC death [adjusted SHR, 0.89 (0.85, 0.93)]. Question: Are there opportunities for improving public-patient outcomes?

(3) Patients born in non-English speaking countries have lower odds of localised disease [adjusted OR, 0.88 (0.79, 0.99)]. – Question: Could this difference be decreased by reducing cultural and language barriers?

(4) Cancers of pulmonary lobes rather than the main bronchus pose lower risks of LC death. Question: Could outcomes for main bronchus cancers be improved by up-skilling or referral to higher-volume centres?

(5) Greater extent of disease is strongly predictive of case fatality – Question: Could LC deaths be reduced by earlier treatment?

(6) Use of lobectomies varies – Question: Could survival be increased through greater use of lobectomies for localised NSCLC?

Conclusions: Linked cancer registry and hospital data can increase system-wide understanding of local health-service delivery and prompt discussion points on how to improve outcomes.

Abbreviations: APDC – Australian Patient Data Collection; CHeReL – Centre for Health Record Linkage; EOD – Extent of Disease; LC – Lung Cancer; NSCLC – Non-Small Cell Cancers; NSWCR – New South Wales Cancer Registry; OR – Relative Odds; SEIFA – Socio-Economic Index for Areas; SES – Socio-Economic Status.

Key words: epidemiology; health service delivery; management.

David Roder
Cancer Information and Analysis Unit
Cancer Institute NSW
Alexandria, New South Wales, Australia.
Centre for Population Health Research
University of South Australia
Adelaide, South Australia, Australia.

Hui You
Cancer Information and Analysis Unit
Cancer Institute NSW
Alexandria, New South Wales, Australia.

Deborah Baker
Cancer Information and Analysis Unit
Cancer Institute NSW
Alexandria, New South Wales, Australia.

Richard Walton
Cancer Analysis and Statistics Unit
Cancer Institute NSW
Alexandria, New South Wales, Australia.

Brian McCaughan
Faculty of Medicine
University of Sydney
Sydney, New South Wales, Australia.

Sanchia Aranda
School of Health Sciences
University of Melbourne
Melbourne, Victoria, Australia.
Cancer Services and Information (formerly)
Cancer Institute NSW
Alexandria, New South Wales, Australia.

David Currow
Chief Executive Officer
Cancer Institute NSW
Alexandria, New South Wales, Australia.

Correspondence:
roder@internode.on.net

Introduction

Decisions in health service administration ideally are guided by objective evidence of local needs and service performance. Because an evidence gap often applies, varying reliance is placed on anecdotal reports and intuitive judgement. In this study, we explore the utility of linked cancer registry and hospital data to reduce the evidence gap and prompt questions for decision-making.

Lung cancer (LC) is used as a case study because of its importance as the leading cause of cancer death in NSW, Australia and worldwide. [1-3] While prevention through reducing tobacco smoking is the principal public health response, preventive benefits can take many years to materialise. [3] Although a reduction in age-standardised LC incidence and mortality of about 30% occurred in New South Wales males in the last 25 years, there was a corresponding 133% increase for females, [1] despite concurrent decreases in tobacco smoking in both sexes. [3] This reflects an extensive lag time. Based on the lag time between smoking decreases and lung cancer mortality reductions in males, female lung cancer mortality is expected to peak soon before beginning to decline. [1] While continued emphasis on reducing tobacco smoking is critically important, supplementary initiatives are needed for more immediate gains, potentially including earlier diagnosis and improved treatment.

Although survival has increased, about 86% of Australian LC patients still die from their disease within five years of diagnosis. [4] The United States figure is similar at 82%. [5] Risk of death potentially could be reduced by earlier diagnosis. [5-7] Compared with localised cases, the relative risk of death in the five years following diagnosis is about 1.6 for regional and 2.1 for distant stage. [5,7] Unfortunately there is not an accepted population-based screening test. [3] Early United States trial data comparing annual helical computed tomography screening with conventional chest X-ray found earlier diagnostic stage and reduced lung cancer mortality for high risk individuals, but confirmatory data are required. [6]

Increased resection could also be beneficial. National Health and Medical Research Council guidelines indicate surgical resection to be the preferred treatment for localised non-small cell cancers (NSCLC), as do other guidelines. [8-10] Treatment differences are important when interpreting survival inequalities, but data on extent of disease (EOD) and treatment rarely are available from Australian cancer registries, which complicates interpretation of survival.

New South Wales has the only Australian state registry that routinely records EOD for all solid tumours. Opportunities exist to link NSCLC incidence and death data from the registry to inpatient treatment statistics, using the Centre for Health Record Linkage (CHeReL). The aim of this study is to explore the administrative utility of linked data for investigating associations of system-wide patient and tumour characteristics with: EOD at diagnosis; treatment by resection (localised NSCLC cases); and death from LC. Results are used to raise questions on how to improve health outcomes.

The extent to which characteristics associated with EOD, resection and LC death represent modifiable causes will need consideration. Nonetheless study results are expected to increase system-wide understanding of local health service delivery and provide an evidence base for guiding discussions on improving service outcomes.

Methods

LC incidence data for 2003 (Jan) - 2007 (Dec) from the NSW Cancer Registry (NSWCR) and associated death data to December 31, 2008 were linked to surgical resection data for the period from January 2003 to June 2008, extracted from the NSW Admitted Patient Data Collection (APDC). APDC data from July 2000 to June 2008 were also linked to NSWCR data to obtain source data on co-morbidity. Data linkage occurred through CHeReL using ChoiceMaker probabilistic linkage software. Resections were included if occurring up to six months after diagnosis.

The NSWCR includes population-based registry data, operating under authority of the *NSW Public Health Act* (1991), which mandates notification by hospitals, pathology laboratories, nursing homes and ancillary sources for invasive cancers (apart from non-melanoma skin cancers) diagnosed in the New South Wales population.

The APDC covers admissions to New South Wales public and private hospitals. NSWCR data were extracted from the registry for the International Classification of Diseases for Oncology (Version 3) (ICD-O-3) C34 topography code but excluding neuroendocrine tumours and non-epithelial cancers, such as soft tissue tumours and sarcomas, fibromatous and myomatous neoplasms. Cancers recorded only on the basis of information from death certification and those first diagnosed at post-mortem were also excluded. [3] In all, 15,014 of 15,498 bronchus and lung cancers on the NSWCR file were included. [3]

Cases were classified by:

- Socio-demographic characteristics – age at diagnosis, sex, country of birth, geographic remoteness of residence, socio-economic status (using the ABS SEIFA (Socio-Economic Index for Areas) relative socio-economic disadvantage index [11]) and Local Health District of residence. The process involved using residential census collection districts to classify by remoteness according to the Australian Standard Geographical Classification (major city, inner regional, outer regional, remote and very remote) and to derive the SEIFA Index of Relative Socio-economic Disadvantage by ABS Statistical Local Area using equal-population quintiles. [11]

Table 1: Relative odds (OR) (95% confidence limits) of localised extent of disease for lung cancers diagnosed in New South Wales in 2003-2007*

Multivariable logistic regression

CHARACTERISTIC	NUMBERS (ALL CANCERS/LOCALISED CANCERS)	ADJUSTED OR **
Age at diagnosis. (yrs.):		
<60	2255/565	1.00
60-69	3275/939	1.17 (1.03, 1.33)
70-79	3927/1210	1.34 (1.19, 1.52)
80+	2037/667	1.61 (1.40, 1.86)
Sex:		
Male	7124/2094	1.00
Female	4370/1287	1.07 (0.98, 1.17)
Public/private status:		
Public	7683/2153	1.00
Private (+ Veterans Affairs)	3636/1187	1.23 (1.12, 1.35)
Unknown	175/41	1.23 (0.83, 1.81)
Remoteness (residence):		
Major city	6523/1950	1.00
Inner regional	3328/925	0.96 (0.84, 1.10)
Outer regional	1505/451	1.08 (0.88, 1.32)
Remote/very remote	138/55	1.54 (1.01, 2.35)

Table 1: Relative odds (OR) (95% confidence limits) of localised extent of disease for lung cancers diagnosed in New South Wales in 2003-2007* ***continued***

CHARACTERISTIC	NUMBERS (ALL CANCERS/LOCALISED CANCERS)	ADJUSTED OR **
SES quintile (SEIFA) (residence):		
1 (least disadvantaged)	1920/565	1.00
2	1908/547	1.00 (0.84, 1.19)
3	2404/688	1.04 (0.86, 1.26)
4	2807/823	1.08 (0.89, 1.31)
5 (most disadvantaged)	2455/758	1.15 (0.94, 1.40)
Country of birth:		
Australia	7493/2223	1.00
Other-English speaking	1431/396	0.93 (0.81, 1.06)
Other-not English speaking	2395/674	0.88 (0.79, 0.99)
Unknown	175/88	2.56 (1.86, 3.52)
Lung location:		
C340 (main bronchus)	1057/294	1.00
C341 (upper lobe)	4269/1502	1.48 (1.27, 1.72)
C342 (middle lobe)	480/191	1.81 (1.43, 2.28)
C343 (lower lobe)	2368/904	1.63 (1.38, 1.92)
C348 (overlapping)	125/35	1.03 (0.67, 1.56)
C349 (not specified)	3195/455	0.45 (0.38, 0.54)
Histology type:		
Adenocarcinoma	3711/1014	1.00
Squamous cell carcinoma	2020/890	1.93 (1.71, 2.18)
Large cell carcinoma	3740/910	0.89 (0.80, 0.99)
Other/unknown	2023/567	1.16 (1.02, 1.32)
Charlson co-morbidity score:		
0	4639/1430	1.00
1+	5687/1686	0.96 (0.87, 1.05)
Unknown	1168/265	0.71 (0.60, 0.83)

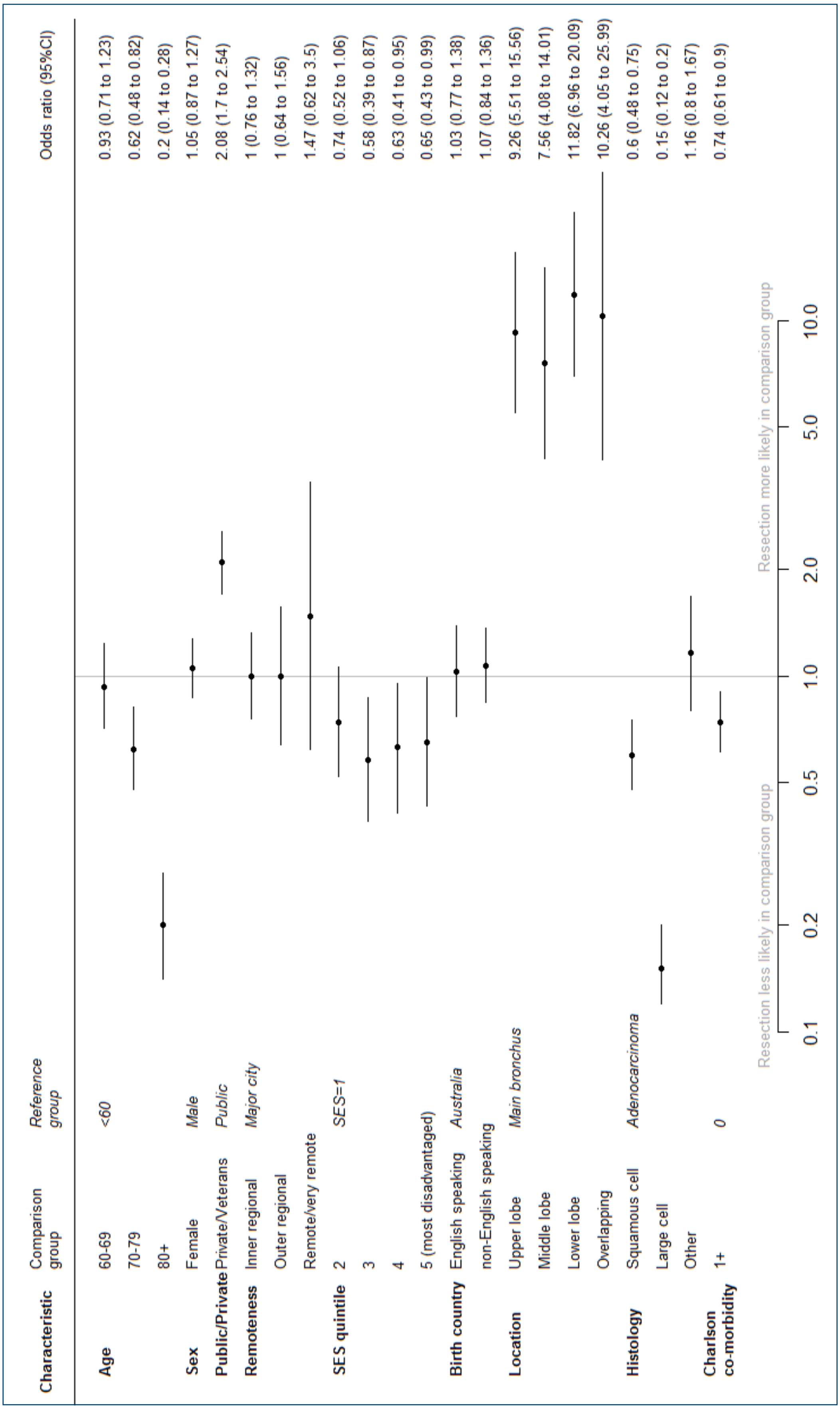
*Data source: NSW Cancer Registry; **Adjusted for other variables in the Table1(and Local Health District of residence).
Note: Excludes cases with unknown extent of disease.

- Histology type – adenocarcinoma, squamous cell carcinoma, large cell carcinoma, and other types, as classified by ICD-O-3. [12]
- Location of tumour - main bronchus and upper, middle and lower pulmonary lobes. [12]
- EOD - localised, regional and distant. [12]
- Resection type - wedge, segmental, lobectomy and pneumonectomy. [12]
- Co-morbidity - Charlson index derived from APDC data for up to five years before LC diagnosis. [13]
- Payment status - public or private (or Veterans coverage) for the payment status applying at the first hospital episode for the index cancer.
- Emergency attendance – as indicated by the urgency of admission flag for admission where treatment was required within 24 hours.

NSWCR and APDC data were linked by CHeReL using probabilistic linkage and identifiers removed before release for analysis. Research ethics approval was obtained [NSW Population and Health Services Research Ethics Committee Reference No. 2009/04/150].

Multiple logistic regression analysis was used to calculate relative odds (odds ratios) of localised compared with more advanced EOD at diagnosis (Table 1), and treatment of localised cases by resection (Figure 1) and resection type, adjusting for socio-demographic and clinical factors. [14] Multivariable competing risk regression was used to calculate

Figure 1: Relative odds (95% CI) of resection for localized non-small cell lung cancer diagnosed in New South Wales in 2003 – 2007*



sub-hazards ratios for LC death from time of diagnosis to death (in months) or December 31, 2008, whichever came first, with deaths from other causes as the competing event. [14] Co-linearity assumptions were checked and log-normal plots examined to test proportionality.

Cases with unknown extent of disease (24.2% of cases) were excluded from logistic regression models comparing localised with more advanced EOD, but were included as a dummy variable in competing risk regression models when deriving sub-hazards ratios for LC death. Missing values for other independent variables were also included as dummy variables. When results of logistic regression and competing risk regression were checked using complete case analysis that excluded cases with missing values, findings were similar. STATA release 12 was used. [14]

Results

By socio-demographic characteristic

Age at diagnosis

Odds of localised EOD were higher for older ages (Table 1). Older cases with localised NSCLC had fewer resections (Figure 1). Compared with those under 60 years, the adjusted relative odds of resection (95% CLs) were 0.62 (0.48, 0.82) and 0.20 (0.14, 0.28) for 70-79 and 80+ year olds respectively. Surgery also tended to be more conservative (p=0.051), the ratio of lobectomies to wedge resections decreasing from 8.5 to 1 for cases less than 60 years to 4.9 to 1 for those aged 80 years or more. The corresponding ratio of lobectomies to wedge and segmental resections decreased from 2.2 to 1 to 1.8 to 1. The older the age, the higher was the risk of LC death (Table 2).

Sex

Females had more conservative resections, the ratio of lobectomies to wedge resections being 5.7 to 1 for females compared with 8.7 to 1 for males (p=0.050). The corresponding ratio of lobectomies to wedge and segmental resections was 1.7 to 1 and 2.2 to 1 respectively. Female patients had a lower risk of LC death (Table 2).

Payment status

Patients with private health insurance (or Veterans coverage) had higher odds of localised EOD (Table 1) and compared with public patients, adjusted relative odds of resection for localised NSCLC of 2.08 (1.70, 2.54) (Figure 1). They also had higher odds of lobectomy compared with wedge resection of 15.8 to 1 compared with 4.6 to 1 for public patients (p<0.001), and of lobectomy compared with wedge and segmental resections, of 3.2 to 1 and 1.4 to 1 respectively (p<0.001). The risk of LC death was lower in insured patients (Table 2).

Remoteness

An unexpected 54% elevation in odds of localised EOD occurred at presentation for residents from remote/very remote compared with major city areas after adjustment (Table 1). Odds of resection from localised NSCLC did not vary by remoteness (Figure 1), nor did types (p>0.200), as indicated by the ratio of lobectomies to wedge resections (p=0.329) and to wedge and segmental resections (p=0.549). Elevated risk of LC death in inner and outer regional than major city areas did not persist after co-variable adjustment (Table 2). Risk of LC death was not elevated in remote/very remote areas.

Socio-economic status (SES)

Adjusted relative odds of resection for localised NSCLC were lower at 0.58 (0.39, 0.87), 0.63 (0.41, 0.95) and 0.65 (0.43, 0.99) for lower quintiles three, four and five respectively compared with quintile one (highest SES) (Figure 1), but resection types did not vary by quintile (p=0.233). SES was not associated with risk of LC death (Table 2).

Country of birth

Adjusted analysis indicated lower odds of localised disease for patients with non-English speaking than Australian country of birth (Table 1) and lower risk of LC death (Table 2). Resection types did not differ by country of birth (p=0.275).

By co-morbidity status

Cases with co-morbidity (Charlson score 1+ Vs 0) had lower adjusted odds of resection than other patients for localised NSCLC at 0.74 (0.61, 0.90) (Figure 1). The lobectomy to wedge resection ratios was 2.2 to 1 and 4.6 to 1 respectively, and the lobectomy to wedge and segmental resection ratios was 1.7 to 1 and 2.3 to 1 respectively. Higher co-morbidity was associated with higher risk of LC death which persisted, although more marginal, in multivariable models (Table 2).

By clinical characteristics

Location

Cancers of pulmonary lobes had higher odds of localised EOD than cancers of the main bronchus (Table 1). Higher adjusted relative odds of resection applied for localised NSCLC of the pulmonary lobes at 9.26 (5.51, 15.56), 7.56 (4.08, 14.01) and 11.82 (6.96, 20.09) respectively, compared with cancers of the main bronchus (Figure 1), but with little difference in resection types (p=0.820). Risk of LC death was lower for LC in pulmonary lobes than the main bronchus (Table 2).

Histology type

Compared with adenocarcinomas, squamous cell lesions had higher and large cell lesions lower odds of localised EOD

Table 2: Sub-hazard ratios (SHR) (95% confidence limits) for cumulative probability of death from lung cancer among New South Wales cases diagnosed in 2003-2007, according to patient and cancer characteristics, and treatment by resection*

Competing risk regression

CHARACTERISTIC	NUMBERS (CASES/LUNG CANCER DEATHS)	UNADJUSTED SHR	ADJUSTED SHR**	ADJUSTED SHR***	ADJUSTED SHR****
Age at diagnosis (yrs.):					
<60	2710/1874	1.00	1.00	1.00	1.00
60-69	4047/2861	1.07 (1.02, 1.13)	1.07 (1.01, 1.13)	1.12 (1.06, 1.18)	1.11(1.05,1.17)
70-79	5232/3951	1.28 (1.21, 1.35)	1.24 (1.17, 1.30)	1.36 (1.29, 1.44)	1.32 (1.25, 1.39)
80+	3025/2396	1.59 (1.50, 1.68)	1.48 (1.39, 1.57)	1.72 (1.61, 1.83)	1.57 (1.47, 1.67)
Sex:					
Male	9374/7012	1.00	1.00	1.00	1.00
Female	5640/4070	0.91 (0.88, 0.94)	0.91 (0.87, 0.95)	0.91 (0.87, 0.94)	0.92 (0.88, 0.95)
Public/private status:					
Public	9891/7526	1.00	1.00	1.00	1.00
Private (+ Veterans Affairs)	4792/3369	0.84 (0.81, 0.87)	0.81 (0.77, 0.84)	0.84 (0.81, 0.88)	0.89 (0.85, 0.93)
Unknown	331/187	0.64 (0.55, 0.74)	0.75 (0.64, 0.88)	0.82 (0.70, 0.96)	0.75 (0.64, 0.88)
Remoteness (residence):					
Major city	8439/6164	1.00	1.00	1.00	1.00
Inner regional	4425/3315	1.07 (1.03, 1.12)	0.99 (0.93, 1.04)	0.99 (0.93, 1.05)	0.98 (0.93,1.04)
Outer regional	1943/1459	1.09 (1.03, 1.15)	0.96 (0.88, 1.05)	0.98 (0.89, 1.07)	0.95 (0.87, 1.04)
Remote/very remote	207/144	0.94 (0.80, 1.10)	0.84 (0.69, 1.02)	0.89 (0.74, 1.07)	0.89 (0.74, 1.07)
SES quintile (SEIFA) (residence):					
1 (least disadvantaged)	2403/1716	1.00	1.00	1.00	1.00
2	2486/1810	1.05 (0.98, 1.11)	1.04 (0.96, 1.12)	1.04 (0.96, 1.13)	1.04 (0.96, 1.12)
3	3206/2391	1.11 (1.05, 1.18)	1.02 (0.93. 1.11)	1.04 (0.96, 1.14)	1.03 (0.95, 1.13)
4	3698/2768	1.12 (1.06, 1.18)	1.01 (0.92, 1.10)	1.03 (0.94, 1.13)	1.02 (0.93, 1.12)
5 (most disadvantaged)	3221/2397	1.09 (1.03, 1.16)	1.06 (0.97, 1.16)	1.07 (0.97, 1.17)	1.06 (0.97, 1.16)
Country of birth:					
Australia	9796/7369	1.00	1.00	1.00	1.00
Other-English speaking	1853/1408	1.02 (0.96, 1.07)	1.00 (0.94, 1.05)	0.98 (0.92, 1.03)	0.98 (0.92, 1.04)
Other-not English speaking	3029/2203	0.90 (0.86, 0.94)	0.91 (0.87, 0.96)	0.88 (0.84, 0.92)	0.88 (0.84, 0.93)
Unknown	336/102	0.30 (0.24, 0.36)	0.31 (0.25, 0.38)	0.36 (0.29, 0.45)	0.39 (0.31, 0.48)
Lung location:					
C340 (main bronchus)	1315/1112	1.00	1.00	1.00	1.00
C341 (upper lobe)	5446/3718	0.61 (0.58, 0.65)	0.64 (0.60, 0.68)	0.68 (0.64, 0.73)	0.78 (0.73, 0.84)
C342 (middle lobe)	614/408	0.59 (0.53, 0.66)	0.60 (0.54, 0.67)	0.66 (0.59, 0.73)	0.75 (0.67, 0.84)
C343 (lower lobe)	2991/2035	0.61 (0.57, 0.66)	0.64 (0.60, 0.69)	0.70 (0.65, 0.75)	0.83 (0.77, 0.89)
C348 (overlapping)	143/98	0.66 (0.53, 0.81)	0.66 (0.53, 0.83)	0.69 (0.54, 0.87)	1.00 (0.80, 1.26)
C349 (not specified)	4505/3711	1.04 (0.97, 1.10)	1.01 (0.94, 1.08)	0.89 (0.83, 0.95)	0.93 (0.87, 1.00)
Histology type:					
Adenocarcinoma	4394/2954	1.00	1.00	1.00	1.00
Squamous cell carcinoma	2645/1776	0.98 (0.92, 1.03)	0.91 (0.86, 0.96)	1.06 (1.00, 1.13)	1.05 (0.99. 1.11)
Large cell carcinoma	5230/4274	1.59 (1.51, 1.66)	1.39 (1.33, 1.46)	1.43 (1.37, 1.50)	1.27 (1.21, 1.34)
Other/unknown	2745/2078	1.31 (1.24, 1.38)	1.44 (1.08, 1.21)	1.16 (1.09, 1.23)	1.04 (0.98, 1.10)

Table 2: Sub-hazard ratios (SHR) (95% confidence limits) for cumulative probability of death from lung cancer among New South Wales cases diagnosed in 2003-2007 ***continued***

CHARACTERISTIC	NUMBERS (CASES/LUNG CANCER DEATHS)	UNADJUSTED SHR	ADJUSTED SHR**	ADJUSTED SHR***	ADJUSTED SHR****
Charlson co-morbidity score:					
0	5740/4149	1.00	1.00	1.00	1.00
1+	7420/5586	1.20 (1.16, 1.25)	1.05 (1.01, 1.10)	1.05 (1.01, 1.09)	1.03 (0.99, 1.08)
Unknown	1854/1347	0.95 (0.90, 1.00)	0.93 (0.88, 0.99)	0.95 (0.90, 1.01)	0.95 (0.90, 1.01)
Extent of disease:					
Localised	3381/1785	1.00		1.00	1.00
Regional	2475/1645	1.45 (1.36, 1.54)		1.48 (1.38, 1.58)	1.44 (1.34, 1.54)
Distant	5638/5122	3.42 (3.24, 3.62)		3.18 (3.00. 3.37)	2.39 (2.25, 2.53)
Unknown	3520/2530	1.62 (1.53, 1.72)		1.39 (1.31, 1.48)	1.05 (0.99, 1.12)
Resection:					
None	12774/10420	5.66 (5.14, 6.22)	3.94 (3.57, 4.35)		
Segmental	462/111	0.87 (0.72, 1.07)	0.86 (0.70, 1.04)		
Wedge	190/68	1.36 (1.08, 1.72)	1.29 (1.03, 1.63)		
Lobectomy	1384/380	1.00	1.00		
Pneumonectomy	204/103	1.95 (1.62,2.35)	1.64 (1.35, 1.98		

*Data source: NSW Cancer Registry; **Adjusted for other variables in Table 2 (+ Local Health District of residence) (except extent of disease and resection); ***Adjusted for other variables in Table 2 (+ Local Health District of residence) (except resection); **** Adjusted for all other variables in Table 2 (+ Local Health District of residence)

(Table 1). Also compared with adenocarcinomas, squamous cell and large cell carcinomas had fewer resections for localised NSCLC, with adjusted relative odds of 0.60 (0.48, 0.75) and 0.15 (0.12, 0.20) respectively (Figure 1), but resection type did not vary (p=0.373). Case fatality was elevated for large cell carcinomas (Table 2).

EOD

Cases with regional and distant spread had higher risk of LC death than localised cases (Table 2).

Resection type

Risks of LC death were highest for non-resected cases (Table 2). Compared with lobectomy cases, risk of LC death was higher for those having a pneumonectomy or wedge resection. Statistically significant differences were not evident between cases having lobectomies and segmental resections (adjusted SHR for segmental resection=0.92 (0.72, 1.19)) (Table 3).

By service characteristics (resection cases/localised and regional EOD only)

Emergency presentation

Cases presenting as an emergency at time of diagnosis had an elevated risk of LC death but this could have occurred by chance (adjusted SHR=1.09 (0.60, 1.97)) (Table 3).

Time from diagnosis to surgery

Unadjusted analysis indicated higher case fatality with longer time to surgery, but the adjusted model did not indicate a significant difference (Table 3).

Hospital resection volume

While SHRs were lower when numbers of lung resections were in the top two of three volume categories, confidence intervals encompassed 1.00 and differences were attributable to chance (Table 3).

Discussion

NSWCR and administrative data provide similar statistical profiles for LC to international research evidence, lending credibility to findings. They include lower odds of surgical resection of localised NSCLC for older people and use of more conservative resection types, likely reflecting accommodations for reduced physiological capacity. [18] Older people also had a higher case fatality from LC, probably due to higher levels of co-morbidity and frailty and lower resection rates for localised NSCLC. [18]

Table 3: Sub-hazard ratios (SHR) (95% confidence limits) for cumulative probability of death from lung cancer among non-small cell cases diagnosed with localised or regional extent of disease in New South Wales in 2003-2007 and treated by resection within six months of diagnosis*

Competing risk regression

CHARACTERISTIC	NUMBERS (CASES/LUNG CANCER DEATHS)	UNADJUSTED SHR	ADJUSTED SHR**
Extent of disease:			
Localised	1168/213	1.00	1.00
Regional	766/312	2.71 (2.28, 3.22)	2.52 (2.09, 3.03)
Resection type:			
Segmental	395/85	0.84 (0.66, 1.06)	0.92 (0.72, 1.19)
Wedge	146/48	1.44 (1.07, 1.93)	1.60 (1.17, 2.21)
Lobectomy	1222/310	1.00	1.00
Pneumonectomy	171/82	2.08 (1.64, 2.64)	1.57 (1.19, 2.09)
Emergency attendance:			
No	1889/511	1.00	1.00
Yes	45/14	1.09 (0.63,1.86)	1.09 (0.60, 1.97)
Time from diagnosis to resection (months):			
<1	844/200	1.00	1.00
1-2	915/264	1.23 (1.02, 1.47)	1.02 (0.84, 1.24)
3-6	175/61	1.60 (1.20, 2.13)	1.12 (0.81, 1.55)
Hospital resection volume per year:			
<16	626/178	1.00	1.00
16-55	671/179	0.92 (0.75, 1.13)	0.87 (0.70, 1.07)
>55	637/168	0.90 (0.73, 1.11)	0.87 (0.68, 1.12)

*Data source: NSW Cancer Registry

**Adjusted for: other variables in Table 3, age at diagnosis; sex; public/private status; remoteness of residence; SES quintile; Local Health District of residence; country of birth; lung location of cancer; histology type; and Charlson co-morbidity

The lower EOD at diagnosis in older patients is contrary to patterns seen for many cancers, [15] but accords with results of earlier United States lung studies. [16,17] While reasons are unknown, it could reflect earlier detection from regular medical attention for tobacco-related respiratory and other comorbidity in older people. Also, less intensive diagnostic investigation of older cases may have led to under detection of more distant disease.

More conservative resections and risk of LC death applied for females than males for localised NSCLC, as reported in other studies. [19,20] Although this was not explained by differences in modelled variables, the measure of co-morbidity was blunt and residual confounding from higher levels of tobacco-induced and other co-morbidity could have led to an artificial elevation of deaths in males. [3]

Private health insurance was associated with more localised EOD, which may reflect higher SES. Higher SES Danish lung cancer cases have also shown higher odds of more localised EOD. [21] New South Wales patients with private insurance had higher odds of resection for localised NSCLC and were more likely to have a lobectomy than more conservative wedge or segmental resections. Similar results have been reported for NSCLC in North America. [22] The privately insured also had a lower risk of LC death which accords with North American evidence. [23] Statistical modelling indicated that this was not explained in New South Wales by more localised EOD at diagnosis, higher resection rates for localised NSCLC or a higher ratio of lobectomies to conservative procedures among the privately insured.

The presence of more advanced EOD at diagnosis among patients born in non-English speaking countries was a novel finding. BreastScreen data show that women from culturally and linguistically diverse backgrounds have lower screening participation. [24] This may be part of a broader pattern where cultural and language barriers reduce or delay use of diagnostic and related health services.

Despite this difference, patients born in non-English speaking countries had a lower recorded risk of LC death than the Australian born. This may be due to a greater residential proximity to specialist treatment centres in major cities or alternatively a healthy migrant effect. It is also possible that underrecording of deaths could occur if significant numbers returned to birth countries in the terminal stages of their disease, such that their deaths were not recorded in Australia.

Reasons for earlier EOD in remote/very remote areas are not known and run counter to data for other populations. [25] Lower access to specialised diagnostic services in these areas may have reduced detection of more advanced disease. An elevation in case fatality was not suggested in remote/very remote regions, which accords with a study of United States Medicare data. [26]

Resection rates for localised NSCLC were lower for lower than upper SES groups in New South Wales, as observed in other populations, [27] potentially due to more limited service access. While United States research has indicated lower survivals in lower SES groups, [27] poorer survivals were not indicated in lower SES areas of New South Wales in multivariable analyses.

Patients with higher co-morbidity had fewer resections for localised NSCLC and their resections were more conservative, as found in other populations. [21] This may reflect attempts to avoid undue surgical risk. It was anticipated that co-morbidity would be predictive of risk of LC death, [28] but only a weak relationship was observed, potentially due to the bluntness of the co-morbidity measure.

Cancers of pulmonary lobes had higher odds of localised EOD than cancers of the main bronchus, possibly reflecting greater visibility in imaging. Higher odds of resection for localised NSCLC presented for those located in pulmonary lobes than the main bronchus where more extensive and complex surgery may carry greater risks, especially for patients with low cardiopulmonary reserve. [29] Risk of LC death was lower for pulmonary lobe lesions than for those in the main bronchus, as reported elsewhere. [29]

Compared with adenocarcinomas, squamous cell lesions had higher odds and large cell lesions lower odds of localised EOD. Squamous cell and large-cell lesions were less likely to be treated by resection. Squamous cell carcinomas are often located centrally where surgery may be more difficult. [29] Risk of LC death was highest for large cell carcinomas, likely due to more aggressive biology. [29] Predictably, advanced EOD was strongly predictive of risk of LC death. For resection cases with localised or regional disease, a higher risk of LC death with longer time to surgery was evident in the unadjusted analysis, but not after co-variable adjustment.

The highest case fatality applied to non-resected cases. This may reflect a causal association for localised NSCLC, but also residual confounding. Compared with those having a lobectomy, risk of LC death following wedge resection was higher. Lobectomy would often be the surgery type of choice in treatments of localised NSCLC with curative intent, [8-10] which may explain the better outcomes for lobectomy cases. The lack of a significant difference in outcomes between lobectomies and segmental resections is consistent with earlier United States findings for early EOD NSCLC. [30,31]

While risk of LC death was lower when hospital numbers for lung resections were in the top two of three volume categories, differences were in the range attributable to chance. Further investigation is needed into relationships between surgical volume within resection types and by sub-group of patients.

The present data are observational, not experimental, and sometimes of sub-optimal quality, as seen for co-morbidity. Nonetheless findings generally accord with the international evidence, which adds to their credibility in the New South Wales setting. The potential for these relationships to be causal and modifiable needs to be considered by the clinical community, along with relevant interventions.

Example questions arising from the present study include:

(1) Is the best balance being achieved between resection and non-resection to accommodate age-related frailty and co-morbidity?

(2) Are there modifiable causal factors for improving survival outcomes for public patients?

(3) Could more advanced EOD in patients born in non-English speaking countries be decreased by reducing cultural and language barriers to services?

(4) Is the best balance being achieved between optimal therapy and accommodations for co-morbidity?

(5) Could the higher risk of LC death for cancers of the main bronchus be reduced by up-skilling or referral to higher-volume centres?

(6) Do opportunities exist for earlier treatment to increase survival? (7) Could survivals be increased through greater use of lobectomies? (8) Are segmental resections an effective substitute for lobectomies for some patients?

Conclusions

Linked registry and administrative data can increase system-wide understanding of health service delivery and outcomes. They prompt questions that could be workshopped with a view to achieving better outcomes. Linked data can provide useful input for administrative decision-making.

Competing interests

The authors declare that they have no competing interests.

References

1. NSW cancer registry statistical reporting [accessed 2015 Jan 15]. Sydney: Cancer Institute NSW; 2014. Available from: http://www.statistics.cancerinstitute.org.au
2. Ferlay J, Bray F, Pisani P, Parkin DM. GLOBOCAN 2002. Cancer incidence, mortality and prevalence worldwide IARC CancerBase No. 5 [Internet]. Version 2.0 [accessed 2014, Nov]. Lyon: IARC Press; 2004.Available from: http://www-dep.iarc.fr/.
3. Australian Institute of Health and Welfare and Cancer Australia. Lung cancer in Australia: an overview [accessed 2015, Jan]. Cancer Series no. 64. Cat. No. CAN 58. Canberra: AIHW; 2011. Available from: <http://www.aihw.gov.au/publication-detail/?id=10737420419>.
4. Australian Institute of Health and Welfare. Cancer survival and prevalence in Australia: period estimates from 1982 to 2010. Cancer series no. 69. Cat. no. CAN 65. Canberra: AIHW; 2012.
5. Howlader N, Noone AM, Krapcho M et al, editors. SEER Cancer Statistics Review, 1975-2011. Bethesda, MD: National Cancer Institute.. Available at http://seer.cancer.gov/csr/1975_2011/, based on November 2013 SEER data submission, posted to the SEER web site, 2014, April.
6. Aberle DR, Adams AM, Berg CD et al. Reduced lung-cancer mortality with low-dose computed tomographic screening. N Engl J Med. 2011;365(5):395-409.
7. Walters S, Maringe C, Coleman MP et al. Lung cancer survival and stage at diagnosis in Australia, Canada, Denmark, Norway, Sweden and the UK: a population-based study, 2004-2007. Thorax. 2013; 68(6):551-64.
8. Cancer Council Australia and Australian Cancer Network (approved by NHMRC). Clinical practice guidelines for the prevention, diagnosis and management of lung cancer. Sydney: Cancer Council Australia; 2004. Available from: http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/cp97.pdf
9. National Comprehensive Cancer Network (NCCN). Clinical Practice Guidelines in Oncology, Non Small Cell Lung Cancer, Version 3.2011 [accessed 2014, Nov]. Available from: www.nccn.com.
10. Scott WJ, Howington J, Feigenberg S, et al. Treatment of non-small cell lung cancer Stage I and stage II: ACCP Evidence Bases Clinical Practice Guidelines (2nd ed). Chest. 2007;132(3): 234S-242S.
11. Australian Institute of Health and Welfare, Cancer Australia and Australasian Association of Cancer Registries. Cancer survival and prevalence in Australia: cancers diagnosed from 1982 to 2004. Cancer Series no. 42. Cat. No. CAN 38. Canberra: AIHW; 2008.
12. Hutchison CL, Menck HR, Burch M, et al, editors. Cancer registry management principles and practice. 2nd ed. Springfield, Illinois: National Cancer Registrars Association; 2004.
13. Charlson ME, Pompei P, Ales KL, et al. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. J Chron Dis. 1987;40(5):373-383.
14. StataCorp. STATA Statistical Software. Release 12. College Station, Texas: StataCorp LP, 2013.
15. Lyratzopoulos G, Abel GA, Brown CH, et al. Socio-demographic inequalities in stage of cancer diagnosis: evidence from patients with female breast, lung, colon, rectal, prostate, renal, bladder, melanoma, ovarian and endometrial cancer. Ann Oncol. 2013; 24(3):843-50.
16. O'Rourke MA, Feussner JR, Feigl P, et al. Age trends of lung cancer stage at diagnosis: implications for lung cancer screening in the elderly. JAMA. 1987;258(7):921-6.
17. Ramalingam S, Pawlish K, Gadgeel S, et al. Lung cancer in young patients: analysis of a Surveillance, Epidemiology, and End Results database. J Clin Oncol. 1998;16:651-7.
18. Ng R, de Boer R, Green MD. Undertreatment of elderly patients with non-small-cell lung cancer. Clin Lung Cancer. 2005;7(3):168-74.
19. De Perrot M, Licker M, Bouchardy C, et al. Sex differences in presentation, management, and prognosis of patients with non-small cell lung carcinoma. J Thoracic Cardiovasc Surg. 2000; 119(1):21-6.
20. Nakamura H, Ando K, Shinmyo T, et al. Female gender is an independent prognostic factor in non-smallcell lung cancer: a meta-analysis. Ann Thorac Cardiovasc Surg. 2010;17(5):469-80.
21. Dalton SA, Frederiksen BL, Jacobsen E, et al. Socioeconomic position, stage of lung cancer and time between referral and diagnosis in Denmark, 2001-2008. Br J Cancer. 2011;105(7):1042-8.
22. Groth SS, Al-Refaie WB, Zhong W, et al. Effect of insurance status on surgical treatment of early-stage non-small cell lung cancer. Ann Thorac Surg. 2013;95(4):1221-6.
23. Xiaolong N, Roche LM, Pawlish KS, et al. Cancer survival disparities by health insurance status. Cancer Medicine. 2013;2(3):403-11.
24. Australian Institute of Health and Welfare. BreastScreen Australia monitoring report 2012-2013 [accessed 2016, Jan]. Cancer series no. 95. Cat. No. CAN 93. Canberra: AIHW; 2015 (Supplementary table S1.11). Available from <http://www.aihw.gov.au/publication-detail/?id=60129552866>.
25. Campbell NC, Elliott AM, Sharp L, et al. Rural and urban differences in stage at diagnosis of colorectal and lung cancers. Brit J Cancer. 2001;84(7):910-4.
26. Shugarman LR, Sorbero MES, Tian H, et al. An exploration of urban rural differences in lung cancer survival among Medicare beneficiaries. Am J Pub Health. 2008;98(7):1280-7.
27. Greenwald HP, Polissar NL, Borgatta EF et al. Social factors, treatment, and survival in early-stage nonsmall cell lung cancer. Am J Public Health. 1998;88(11):1681-4.
28. Little AG, Rusch VW, Bonner JA, et al. Patterns of surgical care of lung cancer patients. Ann Thorac Surg. 2005;80(6):2051-6.
29. Strand TE, Rostad H, Moller B et al. Survival after resection for primary lung cancer: a population based study of 3211 resected patients. Thorax. 2006;61(8):710-5.
30. Ginsberg RJ, Rubinstein LV & Lung Cancer Study Group Randomized trial of lobectomy versus limited resection for T1 N0 non-small cell lung cancer. Ann Thorac Surg. 1995;60(3):615-23.
31. Warren WH, Faber LP. Segmentectomy versus lobectomy in patients with stage 1 pulmonary carcinoma: Five-year survival and patterns of intrathoracic recurrence. J Thorac Cardiovasc Surg. 1994; 107:1087-94

Factors Affecting Hospital Choice Decisions: an exploratory study of healthcare consumers in Northern India

V Kamra, H Singh and K K De

Abstract

This study examines the factors affecting hospital choice decisions by patients for tertiary level healthcare services and the relationships of these factors with respondent demographics. It also categorises the decision makers involved in the selection of hospitals. Data were collected from in-patients of multispecialty hospitals located in northern India with the help of a structured questionnaire. Factor analysis, ANOVA and t-test techniques have been employed to analyse the data. The study has revealed that the factors that affect hospital choice decisions of patients are basic amenities, reputation and quality, building and infrastructure, ease and affordability, personal substances (experiences), responsiveness of services, recommendations and suggestions, clinical support, privacy and information sharing, and range of services. The study has also revealed that various categories of respondent demographics, namely, age, gender, residence, education and monthly family income are significantly different statistically (P<.05) with respect to the identified factors. It has been found that most of the time family members, doctors or a combination of family members and doctors make the decisions to choose the hospital. It has also been found that friends/ relatives and patients themselves choose the hospital in some cases.

Key words: consumer behavior; decision-making; healthcare; India, multispecialty hospitals; patients.

Vishal Kamra
L M Thapar School of Management
Thapar University
Patiala, Punjab, India.

Harjot Singh
L M Thapar School of Management
Thapar University
Patiala, Punjab, India.

Kalyan Kumar De
Amity Business School
Amity University
Noida, UP, India.

Correspondence:
vishalkamra@ymail.com

Introduction

Consumer behavior is the behavior of individuals in seeking, purchasing, using, evaluating and disposing of products and services in the marketplace. [1] Consumer buying behavior is an important aspect of overall consumer behavior. [2] Knowledge of it serves as a tool for marketers to understand what consumers actually buy, why, how, when and how often they buy it, and also how they consume and dispose of it. [3]

Tertiary level healthcare services refer to a third level of the healthcare system, in which specialised consultative care is provided to in-patients suffering from chronic health diseases. Multispecialty hospitals are centres of excellence for in-patient surgical procedures and offer comprehensive healthcare treatment across many specialties. [4]

Hospital choice factors are the service features considered by the patients to select one hospital in comparison to other. [5] Nowadays, patients are showing additional interest in choosing hospitals as well as in the treatment procedures. [6] Therefore, it is important to recognise the factors that affect patient hospital choice decisions as well as to categorise the decision makers involved in the selection.

The Indian healthcare system

India has a population of 1.3 billion people residing in 29 states and seven union territories, 31 percent of which are situated in the northern part of the country that consists of seven states and two union territories. The government has traditionally provided healthcare services in India. In the early post-independence period, the Indian healthcare sector was suffering from a shortage of doctors and nurses, inadequate hospitals as well as a lack of modern medical equipment. In the 1980s, there was an approximate 30 percent decline in the use of both urban and rural public healthcare facilities. Thereafter, this sector has achieved tremendous growth, particularly in the last few decades. It is expected to become US$280 billion sector by the end of 2020. [7]

Defining the problem

A number of studies have been conducted on hospital choice factors in developed countries; however few if any studies have examined the factors affecting hospital choice decisions of patients for tertiary level health diseases at multispecialty hospitals in an emerging economy. The present study is an attempt to bridge this gap in the literature. Its purpose is to explore the factors affecting hospital choice decisions by patients and to examine whether these factors are significantly different statistically with respect to various categories of respondent demographics or not, in the context of the services of multispecialty hospitals in India, an emerging economy. It also attempts to categorise the decision-makers involved in the selection of hospitals.

Literature review

Hospital choice factors

Consumers of healthcare services generally focus on attitudes and behaviors of hospital personnel, reputation and the hospital's image, quality of healthcare services and cleanliness of the facilities to select a hospital for the treatment. [8] Various factors which patients consider before selecting a hospital are nearness to home, availability of specialist doctors, latest technology, clean and hygienic environment, familiarity with hospital staff, past experience with hospital, cost of service, size of hospital and religious affiliation. [9]

Quality of service, a relative living in hospital town, finance, ease of transport, nearness to home, religion and connections with hospital staff are also the key factors in choosing a hospital. [10] Prior use of a hospital service, doctors' or friends' recommendations, courtesy of staff, new facilities, condition-specific reputation, nearness to home, quality of medical care and cost of service are also significant determinants of hospital choice decisions. [11]

The surroundings in which services are delivered have been found to influence hospital choice decisions, including the quality of medical staff, emergency and nursing care, the range of services, modern equipment, doctor-patient relationship, courteous employees, good surroundings, prior use of hospital, cost of care and availability of private rooms. [5] Various studies show that hospital choice decisions are more associated with convenient administrative procedures, quality of services, hospital image, cost of treatment, individual recommendation, waiting times at office visits and health insurance coverage. [12-14]

Patients have become more health conscious and they consider various factors like medical qualifications, cleanliness, infrastructure, payment mode, treatment time, technological capabilities, physical condition, image and reputation of the hospital, hospital size, nursing care and staff behavior, promptness of service, range of services, recommendations by doctor and relatives, waiting time, cost and location before selecting a hospital. [7, 15-19]

Most of the recently published studies have proposed that factors which affect hospital choice decisions of patients are reference by ambulance, physician's advice, family income, insurance type, quality of hospital services, employment of patient's family members in hospital, cost of services, punctuality of staff, publicity and advertisement, nearness of hospital, 24-hour outdoor services, quick admission process, machinery and technology, quality specialist doctors, confidential treatment record and payment modes. [6, 20, 21]

Identifying the decision makers

Patients themselves choose the hospitals for treatment except in emergency situations and mandatory hospitalisation. [22] Previous studies show that patients themselves decide in 22 percent of cases whereas they follow the advice of the doctor in 52 percent of cases. [5] In 62.5 percent of cases doctors decide, in 32.7 percent of cases patients and physicians make the decision and in 4.8 percent of cases patients themselves choose the hospital. [23] As per the findings of Daloglu, [24, p.20] 54 percent of the patients choose the hospital based on a doctor's recommendation, 33 percent decide themselves and 13 percent rely on their friends and relatives. Another study shows that, in 50 percent of cases doctors decide the hospital but in 42 percent of cases patients change their doctor in order to go for their preferred hospital. [15]

Table 1: Disease distribution of respondents from each region

	KNEE-JOINT REPLACEMENT	SPINAL CORD OPERATION	HEART BY-PASS SURGERY	HEART STENT IMPLANT	RENAL FAILURE	HIP-JOINT REPLACEMENT	INTESTINE PROBLEM	LUNG DISORDERS	TOTAL
U.T. 1	33	33	37	51	25	24	7	13	223
State 1	64	26	12	11	33	34	4	8	192
State 2	36	52	33	11	0	0	15	0	147
U.T. 2	34	22	24	6	2	5	11	10	114
State 3	4	9	13	10	13	3	4	8	64
State 4	9	13	14	3	1	0	9	3	52
State 5	1	3	13	2	5	6	3	5	38
State 6	11	6	11	0	0	1	0	0	29
State 7	5	8	5	0	0	5	0	1	24
Total	**197**	**172**	**162**	**94**	**79**	**78**	**53**	**48**	**883**

Methodology

The primary objective of the study was to identify the factors affecting hospital choice decisions of patients and to examine whether these factors are significantly different statistically with respect to patient demographics. Another objective was to categorise the decision makers involved in the selection of hospitals. Patients in multispecialty hospitals, particularly suffering from tertiary level health diseases, based in northern India comprised the population for the study. Patients suffering specifically from eight types of tertiary level health diseases were considered as respondents. Table 1 shows the disease-wise distribution of respondents from each region.

Considering the awareness level of the respondents, a set of 42 questions, based on a self-developed scale, was administered. They were requested to rate the importance of factors affecting their hospital choice decisions on a five-point importance scale (1 = Not At All Important, 2 = Unimportant, 3 = Neither Important Nor Unimportant, 4 = Important, 5 = Extremely Important). Various demographic variables were also considered to understand the diverse behavior of respondents. Table 2 shows the demographic criteria and health insurance break-up of respondents.

The study instrument was pre-tested on a sample of 100 respondents. It was found to be reliable with a value of 0.72 of Cronbach's alpha and valid with the values more than 0.40 of factor loadings for each statement. On the basis of convenience sampling, 1000 questionnaires were distributed and 883 fully-filled responses were received. There was a risk of some bias in this technique; however, it allows researchers to formulate theories quickly. Data were collected between March and August 2014 and were analysed by applying exploratory factor analysis, one way ANOVA and two-tailed t-test (at five percent significance level) with the help of SPSS® 16.0.

Measures of sample adequacy such as Kaiser-Meyer-Olkin (.70) and Bartlett's Test of Sphericity (approx chi-square 21313.85, degrees of freedom 861, significance .00) show that factor analysis can be applied. Principal component analysis with varimax rotation method was used for extracting the factors. Statements with factor loadings greater than value 0.40 were considered. Factors with an Eigen value of one or more were extracted. All the factors were named after discussion with other researchers and on the basis of existing literature. ANOVA and t-test techniques were applied to check the differences between Mean Score (MS) of each category of respondent demographics and the identified factors. The factors were tested individually with respect to all categories of respondent demographics. MS of each demographic category was compared and post hoc analysis was performed on independent demographic variables containing more than two categories.

Results

Ten factors were extracted, which cumulatively explained 65 percent of the total variance. Statistically significant differences ($P<.05$) were found among the various categories of respondent demographics with respect to these factors.

Table 2: Demographic criteria and health insurance break-up of respondents

DEMOGRAPHIC CRITERIA AND HEALTH INSURANCE	NO. OF RESPONDENTS (N=883)	PERCENTAGE (%)
AGE		
Up to 20 Years	52	05.9
21-35 Years	159	18.0
36-50 Years	256	29.0
More than 50 Years	416	47.1
GENDER		
Male	591	66.9
Female	292	33.1
MARITAL STATUS		
Married	787	89.1
Unmarried	96	10.9
RESIDENCE		
Metro City	149	16.9
Non Metro City	423	47.9
Semi Urban Area	204	23.1
Rural Area	107	12.1
EDUCATION		
Post Graduation and Above	194	22.0
Graduation	168	19.0
Diploma	62	07.0
Class XII or Below	439	52.0
OCCUPATION		
Government Employee	62	07.0
Private Employee	141	16.0
Businessmen	263	29.8
Dependent	417	47.2
MONTHLY FAMILY INCOME		
Up to Rs. 25,000		
Rs. 25,001 to Rs. 50,000	93	10.5
Rs. 50,001 to Rs. 75,000	136	14.3
Rs. 75,001 to Rs. 1,00,000	319	36.1
More than Rs. 1,00,000	224	25.4
HEALTH INSURANCE		
Yes	114	12.9
No	769	87.1

Factor analysis

Basic amenities

This was the first factor affecting hospital choice decisions of patients for tertiary level healthcare services. Five service features that significantly load on this factor are availability of facilities like water, electricity, wash rooms and fans, approachable pharmacy, canteen and cafeteria facility, provision for the parking of vehicles and sufficient waiting areas. The eigen value of this factor was found to be 3.568 and explained the variance of 8.496%. Findings of other studies also show that basic amenities are the considerable determinants of hospital choice decisions. [18]

Reputation and quality

This was the second factor affecting hospital choice decisions of patients. Six service features which significantly load on this factor are the brand name of the hospital, the reputation of doctors associated with the hospital, general image of the hospital in society, years of existence of the hospital, religious/cultural preference and quality specialist doctors. The eigen value of this factor was found to be 3.447 and explained the variance of 8.208%. Various studies also show that these service features are significant determinants of hospital choice decisions. [19]

Building and infrastructure

This was the third factor affecting hospital choice decisions of patients. Six service features that significantly load on this factor are the latest equipment and facilities in the operation theatre, modern living room facilities, hospital building and infrastructure, availability of latest and hi-tech equipment and number of the rooms and beds. The eigen value of this factor was found to be 3.226 and explained the variance of 7.681%. Previous studies also show that these service features are important determinants of hospital choice decisions. [6]

Ease and affordability

This was the fourth factor affecting hospital choice decisions of patients. Six service features that significantly load on this factor are the cost of hospital services, ease of approaching the hospital and getting appointments, proximity of the hospital to your place of residence, tie up of the hospital with the insurance companies and timing of the OPD services. The eigen value of this factor was found to be 3.128 and it explained the variance of 7.448%. Findings of various studies also support these findings. [16]

Personal substances (experiences)

This was the fifth factor affecting hospital choice decisions of patients. Four service features that significantly load on this factor are any friend/relative who is working in the hospital, awareness about a disease and its treatment process, severity and duration of the illness and your previous experience with the hospital. The eigen value of this factor was found to be 2.736 and it has explained the variance of 6.513%. Previous studies also support these service features as determinants of hospital choice decisions. [20]

Responsiveness of services

This was the sixth factor affecting hospital choice decisions of patients. Three service features that significantly load on this factor are the punctuality and courteous behavior of nursing staff, quick administrative procedures, speed in the delivery of services and waiting time to get treated. The eigen value of this factor was found to be 2.537 and has explained the variance of 6.040%. Findings of various studies also support these findings. [7]

Recommendations and suggestions

This was the seventh factor affecting hospital choice decisions of patients. Three service features that significantly load on this factor are a recommendation by someone who has already had the treatment, a recommendation by your friends/relatives and by your local doctor. The eigen value of this factor was found to be 2.369 and explained the variance of 5.640%. Previous studies also show that these service features are relevant determinants of hospital choice decisions. [11]

Clinical support

This was the eighth factor affecting hospital choice decisions of patients. Two service features that significantly load on this factor are provision for the ambulance, blood bank and laboratories. The eigen value of this factor was found to be 2.173 and explained the variance of 5.174%. Findings of various studies also support these findings. [5]

Privacy and information sharing

This was the ninth factor affecting hospital choice decisions of patients. Two service features that significantly load on this factor are privacy and dignity during treatment and sharing of information with patients. The eigen value of this factor was found to be 2.151 and it has explained the variance of 5.123%. Previous studies also support these service features as determinants of hospital choice decisions. [21]

Range of services

This was the tenth factor affecting hospital choice decisions of patients for tertiary level healthcare services. Five service features that significantly load on this factor are the availability of emergency, general health and specialised healthcare services, service packages like full body checkup and having all the medical departments. The eigen value of this factor was found to be 2.054 and it has explained the variance of 4.890%. Findings of various studies also support these service features as determinants of hospital choice decisions. [15]

ANOVA and t-test

Age

Age has a positive effect on hospital choice decisions of patients. Korgaonkar et al [25] have observed the importance of prior experience in the minds of aged patients. For this study also, respondents in the age group of 'more than 50 years' reported remarkably higher importance (MS=4.79) with respect to 'personal substance (experience)' in comparison to other categories. The respondents of '21-35 years' category showed relatively lower importance (MS=3.96). This may be due to the severity and duration of illness and the patients' previous experience of the same hospital. The respondents of 'more than 50 years' category might have severe levels of illness. The difference could also be due to varying levels of awareness about the disease and its treatment process. The patients in the age group of '21-35 years' have also been observed to be highly educated in comparison to the patients in age bracket of 'more than 50 years'.

Table 3: Lists of names, statements, factor loadings and values of Cronbach's alpha for all the factors

NAME OF FACTORS	STATEMENTS	FACTOR LOADINGS	VALUES OF CRONBACH'S ALPHA
Basic amenities	Sufficient waiting area	0.757	0.784
	Approachable medical shop	0.711	
	Canteen and cafeteria facility	0.699	
	Provision for the parking vehicles	0.689	
	Availability of facilities like water, electricity, wash rooms, fans etc.	0.632	
Reputation and quality	Years of existence of the hospital	0.795	0.684
	Brand name of the hospital	0.739	
	Fame of the doctors associated with the hospital	0.719	
	General image of the hospital in the society	0.565	
	Quality specialist doctors	0.511	
	Religious / cultural preference	0.451	
Building and infrastructure	Latest equipment and facilities in the operation theater	0.741	0.733
	Modern living room facilities	0.736	
	Hospital's building and infrastructure	0.554	
	Number of the rooms and beds	0.541	
	Availability of latest and hi-tech equipment	0.493	
Ease and affordability	Proximity of the hospital to your place of residence	0.811	0.785
	Ease of getting appointments	0.775	
	Ease of approaching the hospital	0.735	
	Timing of the OPD services	0.733	
	Tie up of the hospital with the insurance companies	0.579	
	Cost of the hospital services	0.489	
Personal substances (experiences)	Any friend / relative / known who is working in the hospital	0.841	0.758
	Awareness about disease and its treatment process	0.825	
	Severity and duration of the illness	0.618	
	Your previous experience with the hospital	0.539	
Responsiveness of services	Punctuality and courteous behavior of the nursing staff	0.841	0.713
	Quick administrative procedures	0.662	
	Speed in the delivery of services	0.626	
	Waiting time to get treated	0.417	
Recommendations and suggestions	Recommendation by your local doctor	0.799	0.752
	Recommendation by someone who has already taken the treatment	0.722	
	Recommendation by your friends/relatives	0.648	

Table 3: Lists of names, statements, factor loadings and values of Cronbach's alpha for all the factors *continued*

NAME OF FACTORS	STATEMENTS	FACTOR LOADINGS	VALUES OF CRONBACH'S ALPHA
Clinical support	Provision for the ambulance and blood bank	0.719	0.694
	Provision for the laboratories	0.674	
Privacy and information sharing	Sharing of information about treatment process with patient	0.795	0.826
	Privacy and dignity while treatment process	0.767	
	Availability of service packages like full body checkup etc.	0.798	0.652
	Availability of general health care services	0.732	
	Availability of specialised health care services	0.646	
	Having all the medical departments	0.481	
Range of services	Availability of emergency health care services	0.448	

Gender

Gender has a positive effect on hospital choice decisions of patients. Roh and Lee [18] have found male respondents to be more concerned about the delivery of services. In this study also, male respondents reported significantly higher importance (MS=4.28) with respect to 'responsiveness of services' in comparison to that reported by female respondents (MS=3.78). Male respondents also reported considerably higher importance (MS=3.74) with respect to 'range of services' in comparison to that reported by female respondents (MS=2.94). It may be due to a greater concern by the male patients about the available services, time of service delivery and quick administrative procedures. The differences could also be due to higher concern by male respondents about the punctuality of the doctors and staff members, behavior of doctors and staff members, and quality of care provided by nursing staff than that of female respondents.

Residence

Residence has an important influence on hospital choice decisions of patients. Gesler and Meade [26] and Mheen et al [27] have confirmed that rural area patients are more concerned about the timely delivery of services. Respondents from a 'rural area' in this study, also reported notably higher importance (MS=4.31) with respect to 'responsiveness of services' in comparison to other categories. The respondents from a 'metro city' category have shown relatively lower importance (MS=3.93). The respondents from a 'metro city' have also reported considerably higher importance (MS=4.27) with respect to 'privacy and information sharing' in comparison to other categories. The respondents from a 'non metro city' category showed a relatively lower importance (MS=4.01). This may be due to the travel time to receive the treatment. It is quite possible that respondents of 'rural area' do not find it comfortable to have long waiting periods and lengthy administrative procedures compared to the respondents in other categories. The differences could also be due to high awareness level of 'metro city' respondents about the treatment process and confidentiality of complete health records.

Education

Knowledge, education and awareness about the disease and its treatment process have significant impact on the hospital choice decisions of patients. Lane and Lindquist [5] have studied not only the awareness of educated people for the various dimensions of hospital services, but also the importance of their personal preferences for the hospital selection. It was found that respondents of 'graduation' category in this study reported significantly higher importance (MS=4.52) with respect to 'personal substance (experience)' in comparison to other categories. The respondents of 'class XII or below' category showed relatively lower importance (MS=4.17). It may be due to the awareness about disease and its treatment process and reference of any friend or relative, who is already working in the hospital. The respondents of the 'graduation' category might have more knowledge about the symptoms, reasons and treatment process of the disease. The differences could also be due to the trust of the patients of 'class XII or below' category in a friend or relative who is already working in the hospital.

Monthly family income

Monthly family income has a positive influence on the hospital choice decisions of patients. You and Kwon [28] have concluded that middle class patients are more concerned about the availability of basic facilities in the hospitals. Respondents of this study, having monthly family incomes of 'Rs. 25,001 to Rs. 50,000' also reported notably higher importance (MS=3.92) with respect to 'basic amenities' in comparison to other categories. The respondents having monthly family incomes of 'Rs. 50,001 to Rs. 75,000' category showed relatively lower importance (MS=3.17). It may be due to availability of basic facilities in the hospital premises. The respondents in the monthly family income group of 'Up to Rs. 25,000' and 'Rs. 25,001 to Rs. 50,000' might have more concern about basic facilities like waiting areas, pharmacy, cafeteria, parking, lights, water and fans than the patients of other categories. The difference could also be due to lower concern of the respondents of other categories about basic amenities in the hospital.

Decision-makers involved in the selection of hospitals

Five categories were observed to be actively engaged in the selection of hospitals. Family members decided in 49.6 percent of cases, doctors decided in 12.3 percent of cases, family members and doctors together decided in 19.5 percent of cases, friends/relatives decided in 10.4 percent of cases, and patients themselves decided in 8.2 percent of cases. Previous studies have also presented the similar findings. [15] Table 4 shows the decision-makers involved in the selection of hospitals.

Conclusion and implications

The results of this study revealed that the ten factors affecting hospital choice decisions of patients are: basic amenities, reputation and quality, building and infrastructure, ease and affordability, personal substances (experiences), responsiveness of services, recommendations and suggestions, clinical support, privacy and information sharing and range of services. It was found that statistically significant differences (P<.05) exist among the various categories of respondent demographics with respect to these factors. These differences were observed among the various categories of age, gender, residence, education and monthly family income, with respect to the factors, namely, 'personal substance (experience)', 'responsiveness of services' and 'range of services', 'responsiveness of services' and 'privacy and information sharing', 'personal substance (experience)' and 'basic amenities, respectively. It was also found that family members, doctors, family members and doctors together, friends/relatives and patients themselves chose the hospitals for the treatment. Various other studies have also reported these findings. [6,18,19]

These results have implications for healthcare organisations' marketing and policy formulations. They can be used by healthcare organisations, doctors and other healthcare professionals to improve the quality of services. In addition, this study is expected to make a meaningful contribution to the literature on healthcare marketing. Researchers may also benefit from this study while undertaking similar studies in future.

Limitations and future research

One limitation of this study is that it has been conducted in north India. Though the results concur with other studies conducted in other countries, future research could examine the factors affecting hospital choice decisions of patients from different parts of the world. Another limitation is that the study has been conducted with a limited number of respondents using convenience sampling methods. Future research could look at increasing the sample size or using other methods of sampling to gain more insight into the factors affecting hospital choice decisions. Additionally, the researchers could attempt to explore more factors in this regard and a disease-wise analysis could also be carried out to further understand the factors which affect hospital choice decisions of patients for tertiary level health diseases.

Table 4: Decision-makers involved in the selection of hospitals

DECISION-MAKERS	NUMBER OF CASES (N=883)	PERCENTAGE (%)
Family members	438	49.6
Doctors	109	12.3
Doctors and family members	172	19.5
Friends and relatives	92	10.4

Competing interests

The authors declare that they have no competing interests.

References

1. Schiffman L, David B, Aron O, Angela P, Leslie K. Consumer behaviour, 3rd Edition. Frenchs Forest, NSW: Pearson Education; 2005.
2. Gensch DH, Javalgi RG. The influence of involvement on disaggregate choice models. Journal of Consumer Research. 1987;14(June):71-82.
3. Brent CM. International patterns of consumer behavior. In: Mary Jane Schlinger, editor. Advance consumer research, Volume 2 (ed). Association for Consumer Research; 1975. p. 93-103.
4. Mishra PH, Mishra T. Study of patient satisfaction at a super specialty tertiary care Hospital. Indian Journal of Clinical Practice. 2014;25(7):624-634.
5. Lane PM, Lindquist JD. Hospital choice: a summary of the key empirical and hypothetical findings of the 1980s. J Health Care Mark. 1988;8(4):5-20.
6. Bahrami MA, Jannati A, Gholizadeh M, Alizadeh L, Khodayari MT. A survey of factors affecting patients' decision in selecting governmental and private hospitals in Tabriz, Iran. Journal of Tourism Research and Hospitality. 2013;2(1):1-4.
7. Verma DS, Khandelwal U. Consumers' preferences towards service industry: a factorial study of health care industry. International Journal of Multidisciplinary Research. 2011;1(8):83-89.
8. Berkowitz EN, Flexner W. The market for health services: is there a non-traditional consumer? J Health Care Mark. 1980;1(1):25-34.
9. Boscarino, Joseph, Steiber SR. Hospital shopping and consumer choice. J Health Care Mark. 1982;2(2):23-25.
10. Egunjobi L. Factors influencing choice of hospitals: a case study of the northern part of Oyo State, Nigeria. Soc Sci Med. 1983; 17(9):585-589.
11. Wolinsky FD, Kurz RS. How the public chooses and views hospitals. Hospital and Health Services Administration. 1984;29(6):58-67.
12. Bin SK. Factors affecting patient's choice of hospitals. Ann Saudi Med. 1997;18(5):420-424.
13. Keaveney SM. Customer switching behavior in service industries: an exploratory study. The Journal of Marketing. 1995;59(2):71-82.
14. Hanna N, Schoenbachler DD, Gordon GL. Physician choice criteria: factors influencing patient selection of generalists versus specialists. Health Mark Q. 1994;12(2):29-42.
15. Akinci F, Esatoglu AE, Tengilimoglu D, Parsons A. Hospital choice factors: a case study in Turkey. Health Mark Q. 2005;22(1):3-19.
16. Bhangale V. Marketing of healthcare services in India: a study on factors influencing patients' decision making on choice of a hospital. J Manag Marketing Healthc. 2011;4(4):229-233.
17. Borah BJ. A mixed logit model of health care provider choice: analysis of NSS data for rural India. Health Economics. 2006; 15(9):915-932.
18. Roh CY, Lee KH. Hospital choice by rural Medicare beneficiaries: does hospital ownership matter? – A Colorado case. J Health Hum Serv Adm. 2005;28(3):346-365.
19. Vonberg RP, Sander C, Gastmeier P. Consumer attitudes about health care – acquired infections: A German survey on factors considered important in the choice of a hospital. Am J Med Qual. 2008;23(1):56-59.
20. Dubey P, Sharma SK. Factors affecting choice of hospital services in bilaspur city. Abhinav: International Monthly Refereed Journal of Research In Management and Technology. 2013;2(April):97-104.
21. Ngondi BW. Factors influencing access to health care services among cervical cancer patients at Kenyatta national hospital [Doctoral dissertation]. University of Nairobi; 2014.
22. Jackson B, Jensen J. Cost issues. National consumer study (Lincoln NE). Nebraska: National Research Corporation; 1985.
23. Smith SM, Clark M. Hospital image and the positioning of service centers: an application in market analysis and strategy development. J Health Care Mark. 1990;10(3):13-22.
24. Daloglu, G. Özel hastaneyi kullananlarn tercih nedenleri ve seçilen hastalk gruplarindaki ortalama yatis süresi. Hacettepe Üniversitesi Saglik Bilimleri Enstitüsü Yayinlanmamis Yüksek Lisans Tezi, Ankara; 1991. (In Turkish).
25. Korgaonkar PK, Lund D, Price B. A structural equations approach toward examination of store attitude and store patronage behavior. Journal of Retailing. 1985;61(2):39-60.
26. Gesler WM, Meade MS. Locational and population factors in health care-seeking behavior in Savannah, Georgia. Health Services Research. 1988;23(3):443-462.
27. Mheen PJM et al. The relative importance of quality of care information when choosing a hospital for surgical treatment a hospital choice experiment. Med Decis Making. 2011; 31(6):816-827.
28. You CH, Kwon YD. Factors influencing medical institution selection for outpatient services. Journal of the Korean Medical Association. 2012;55(9):898-910.

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Aboriginal and Torres Strait Islander health performance framework 2014 report: detailed analyses.
AIHW (2015)
http://www.aihw.gov.au/publication-detail/?id=60129550779

The Road Is Made by Walking: Towards a better primary health care system for Australia's First Peoples. Summary report.
Dwyer J, Martini A, Brown C, Tilton E, Devitt J, Myott P, et al.
Lowitja Institute (2015)
https://www.lowitja.org.au/lowitja-publishing/L046

Good Beginnings: Getting it right in the early years. Review of the evidence on the importance of a healthy start to life and on interventions to promote good beginning.
Emerson L, Fox S, Smith C
The Lowitja Institute (2015)
https://www.lowitja.org.au/lowitja-publishing/L048

Aboriginal communities improving Aboriginal health: An evidence review on the contribution of Aboriginal Community Controlled Health Services to improving Aboriginal health.
Aboriginal Health & Medical Research Council. (2015)
http://www.ahmrc.org.au/index.php?option=com_docman&task=doc_download&gid=262&Itemid=45

AGED CARE

The cost of providing end of life care for nursing care home residents: A retrospective cohort study.
Ennis, L., Kinley, J., Hockley, J., McCrone, P.
Health Services Management Research 2015; 28(1-2):16-23.
Held at ACHSM Library

AUSTRALIAN HEALTH SYSTEM

Is our health workforce prepared for future health megatrends?
Day, G. E.
Australian Health Review 2015; 39(5):487-488.
Held at ACHSM Library

Retirement patterns of Australian doctors aged 65 years and older.
Joyce, C. M., Wang, W. C., McDonald, H. M.
Australian Health Review 2015; 39(5):582-587.
Held at ACHSM Library

Australian doctors' non-clinical activities: results from the Medicine in Australia: Balancing Employment and Life (MABEL) survey of doctors.
Joyce, C., Eyre, H., Wang, W. C., Laurence, C.
Australian Health Review 2015; 39(5):588-594.
Held at ACHSM Library

Health expenditure Australia 2013-14: analysis by sector.
AIHW (2015)
http://www.aihw.gov.au/publication-detail/?id=60129553112

eHEALTH

Electronic Health Record Adoption In US Hospitals: Progress Continues, But Challenges Persist.
Adler-Milstein, J., DesRoches, C. M., Kralovec, P., Foster, G., Worzala, C., Charles, D., et al.
Health Affairs 2015 (web first).
Held at ACHSM Library

Social media used as a health intervention in adolescent health: A systematic review of the literature.
Shaw, J. M., Mitchell, C. A., Welch, A. J., Williamson, M. J.
Digital Health 2015; 1.
http://dhj.sagepub.com/content/1/2055207615588395.abstract

EMERGENCY MEDICINE

National Emergency Access Targets metrics of the emergency department–inpatient interface: measures of patient flow and mortality for emergency admissions to hospital.
Sullivan, C., Staib, A., Eley, R., Scanlon, A., Flores, J., Scott, I.
Australian Health Review 2015; 39(5):533-538.
Held at ACHSM Library

The 'unnecessary' use of emergency departments by older people: findings from hospital data, hospital staff and older people.
Faulkner, D., Law, J.
Australian Health Review 2015; 39(5):544-551.
Held at ACHSM Library

Accessible and continuous primary care may help reduce rates of emergency department use. An international survey in 34 countries.
van den Berg, M. J., van Loenen, T., Westert, G. P.
Family Practice 2016; 33(1):42-50.
Held at ACHSM Library

FUNDING

The Risks and Rewards of Value-Based Reimbursement.
Henkel, R. J., Maryland, P. A.
Frontiers of Health Services Management 2015; 32(2):3-16.
Held at ACHSM Library

Value-based reimbursement: the banner health network experience.
Kuhn, B., Lehn, C.
Frontiers of Health Services Management 2015; 32(2):17-31.
Held at ACHSM Library

Value-Based Payment: Supporting an Intertwined Clinical-Business Model.
Fifer, J.
Frontiers of Health Services Management 2015; 32(2):39-47.
Held at ACHSM Library

Moving Toward Value-Based Care and Payment.
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Frontiers of Health Services Management 2015; 32(2):48-53.
Held at ACHSM Library

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Tucker, S., Hughes, J., Brand, C., Buck, D., Challis, D.
Health Services Management Research 2015; 28(1-2):34-45.
Held at ACHSM Library

HEALTHCARE – OS

International Profiles of Health Care Systems, 2015.
The Commonwealth Fund (2016)
http://www.commonwealthfund.org/publications/fund-reports/2016/jan/international-profiles-2015

Annual Update of Key Results 2014/15: New Zealand Health Survey.
NZ Ministry of Health (2015)
http://www.health.govt.nz/publication/annual-update-key-results-2014-15-new-zealand-health-survey

The New Zealand Casemix System – An Overview.
NZ Ministry of Health (2015)
http://www.health.govt.nz/publication/new-zealand-casemix-system-overview-0

Comparing the Health Care Systems of High-Performing Asian Countries.
Smullen, A., Hong, P. K.
Asia & the Pacific Policy Studies 2015; 2(2):347-355.
http://dx.doi.org/10.1002/app5.76

The Year of the Monkey and Progress in Public Health in the Asia Pacific Region.
Binns, C., Low, W. Y.
Asia-Pacific Journal of Public Health 2016; 28(1):4-6.
http://aph.sagepub.com/content/28/1/4.short

HEALTH FACILITIES PLANNING & DESIGN

Ensuring safe hospitals through interior design.
Ferenc, J.
Health Facilities Management 2015; 28(12):12-13.
Held at ACHSM Library

The Front lines of patient safety: Multilevel efforts improve the care environment.
Kehoe, B.
Health Facilities Management 2015; 28(12):36-37.
Held at ACHSM Library

Creating a culture of safety: Facilities professionals play bigger role in maintaining patient welfare.
Burmahl, B.
Health Facilities Management 2015; 28(12):20-22.
Held at ACHSM Library

Building a safe environment.
Ferenc, J.
Health Facilities Management 2015; 28(12):23-26.
Held at ACHSM Library

Buldle up to fight infections: Patient safety efforts widen to help hospitals combat antibiotic-resistant bacteria.
Kehoe, B.
Health Facilities Management 2015; 28(12):27-30.
Held at ACHSM Library

Infrastructures to improve safety: Technology and engineering systems help boost environment of care.
Hrickiewicz, M.
Health Facilities Management 2015; 28(12):32-35.
Held at ACHSM Library

Linking patient safety and the supply chain.
Vesely, R.
Health Facilities Management 2015; 28(12):37-39.
Held at ACHSM Library

Design standards for imaging spaces: Complying with new Joint Commission safety requirements.
Gilk, T.
Health Facilities Management 2015; 28(12):44-47.
Held at ACHSM Library

Economies of Scale: Large hospital projects aim for increased efficiency and consolidated services.
Eagle, A.
Health Facilities Management 2016; 29(1):16-20.
Held at ACHSM Library

Unlocking facilities Data: Measuring building performance over a real-estate portfolio.
Oswald, P.
Health Facilities Management 2016; 29(1):21-24.
Held at ACHSM Library

Ambulatory Environments: Eight ways hospitals are reaching out into the communities.
Aliber, J.
Health Facilities Management 2016; 29(1):25-29.
Held at ACHSM Library

Barriers to entry: Advanced access-control technologies protect against external threats.
Lorenzi, N.
Health Facilities Management 2016; 29(1):31-34.
Held at ACHSM Library

Facility-specific pest management.
Harrison, R.
Health Facilities Management 2016; 29(1):41-43.
Held at ACHSM Library

6 major trends shaping the design and delivery of healthcare facilities in Australia: Creating the 21st century infrastructure needed to deliver best value.
Healthcare Facilities Design and Development (2015)
Held at ACHSM Library

HOSPITAL ADMINISTRATION

Staphylococcus aureus bacteraemia in Australian public hospitals 2014-15: Australian hospital statistics.
AIHW (2015)
http://www.aihw.gov.au/publication-detail/?id=60129554209

Quality management and perceptions of teamwork and safety climate in European hospitals.
Kristensen, S., Hammer, A., Bartels, P., Suñol, R., Groene, O., Thompson, C. A., et al.
International Journal for Quality in Health Care 2015; 27(6):498-505.
Held at ACHSM Library

Getting Rid of "Never Events" in Hospitals.
Morgenthaler, T., Harper, C.
Harvard Business Review 2015.
https://hbr.org/2015/10/getting-rid-of-never-events-in-hospitals
Held at ACHSM Library

Hospital Quarterly: Performance of NSW public hospitals – July to September 2015.
Bureau of Health Information (2015)
http://bhi.nsw.gov.au/publications/hospital_quarterly_nsw/hospital_quarterly_report_vol_6_issue_3

INNOVATION

The Science And Art Of Delivery: Accelerating The Diffusion Of Health Care Innovation.
Parston, G., McQueen, J., Patel, H., Keown, O. P., Fontana, G., Al Kuwari, H., et al.
Health Affairs 2015; 34(12):2160-2166.
Held at ACHSM Library

The digital revolution: eight technologies that will change health and care.
Gretton, C. and Honeyman, M.
The Kings Fund (2016)
http://www.kingsfund.org.uk/publications/articles/eight-technologies-will-change-health-and-care

KNOWLEDGE MANAGEMENT

Can Knowledge-Intensive Teamwork Be Managed? Examining the Roles of HRM Systems, Leadership, and Tacit Knowledge.
Chuang, C. H., Jackson, S. E., Jiang, Y.
Journal of Management 2016; 42(2):524-554.
Held at ACHSM Library

MANAGEMENT

Training crisis means more bullying.
Lindsay, T.
[cited 2016 28/1/2016]. Available from: https://www.mja.com.au/insight/2016/2/training-crisis-means-more-bullying?utm_source=MJA%20InSight&utm_campaign=1b4b2d7209-MJA_InSight_25_January_20161_22_2016&utm_medium=email&utm_term=0_7346f35e23-1b4b2d7209-42241813.

NURSING

Determinants of job satisfaction for novice nurse managers employed in hospitals.
Djukic, M., Jun, J., Kovner, C., Brewer, C., Fletcher, J.
Health Care Management Review 9000; (Publish Ahead of Print).
Held at ACHSM Library

QUALITY

Care that Matters: Quality Measurement and Health Care.
Saver, B. G., Martin, S. A., Adler, R. N., Candib, L. M., Deligiannidis, K. E., Golding, J., et al.
PLoS medicine 2015; 12(11):e1001902-e1001902.
http://dx.doi.org/10.1371/journal.pmed.1001902

WORKFORCE PLANNING

Review of medical intern training final report.
Wilson, A. and Feyer, A.
Australian Health Ministers' Advisory Council (2015)
http://www.coaghealthcouncil.gov.au/Portals/0/Review%20of%20Medical%20Intern%20Training%20Final%20Report%20publication%20version.pdf

REPORTS OF INTEREST

The Role of Public-Private Partnerships in Health Systems Strengthening: Workshop.
Taylor, R. and Christian, J.
Institute of Medicine (2016)
Held at ACHSM Library

Oral Health and Dental Care in Australia; key facts and figures 2015.
AIHW (2016)
http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=60129554381

Australia's mothers and babies 2013 – in brief.
AIHW (2015)
http://www.aihw.gov.au/publication-detail/?id=60129553770

General practice activity in Australia 2014&-15. General practice series no. 38
Britt H, Miller GC, Henderson J, Bayram C, Harrison C Valenti L, Wong C, Gordon J, Pollack AJ, Pan Y, Charles J
Sydney University Press (2015)
http://purl.library.usyd.edu.au/sup/9781743324523

Health expenditure Australia 2013-14: analysis by sector.
AIHW (2015)
http://www.aihw.gov.au/publicationdetail/?id=60129553112

Healthy Communities: Potentially preventable hospitalisations in 2013-14.
National Health Performance Authority (2015)
http://www.myhealthycommunities.gov.au/Content/publications/downloads/NHPA_HC_Report_PPH_December_2015.pdf

NSW Auditor-General's report on Health entities.
Audit Office of NSW (2015)
http://www.audit.nsw.gov.au/publications/latest-reports/volume-ten-2015-health

GUIDELINES FOR CONTRIBUTORS

Manuscript Preparation and Submission

General Requirements

Language and format

Manuscripts must be typed in English, on one side of the paper, in Arial 11 font, double spaced, with reasonably wide margins using Microsoft Word.

All pages should be numbered consecutively at the centre bottom of the page starting with the Title Page, followed by the Abstract, Abbreviations and Key Words Page, the body of the text, and the References Page(s).

Title page and word count

The title page should contain:

1. **Title**. This should be short (maximum of 15 words) but informative and include information that will facilitate electronic retrieval of the article.
2. **Word count**. A word count of both the abstract and the body of the manuscript should be provided. The latter should include the text only (ie, exclude title page, abstract, tables, figures and illustrations, and references). For information about word limits see *Types of Manuscript: some general guidelines* below.

Information about authorship should not appear on the title page. It should appear in the covering letter.

Abstract, key words and abbreviations page

1. **Abstract** – this may vary in length and format (ie structured or unstructured) according to the type of manuscript being submitted. For example, for a research or review article a structured abstract of not more than 300 words is requested, while for a management analysis a shorter (200 word) abstract is requested. (For further details, see below - Types of Manuscript – some general guidelines.)
2. **Key words** – three to seven key words should be provided that capture the main topics of the article.
3. **Abbreviations** – these should be kept to a minimum and any essential abbreviations should be defined (eg PHO – Primary Health Organisation).

Main manuscript

The structure of the body of the manuscript will vary according to the type of manuscript (eg a research article or note would typically be expected to contain Introduction, Methods, Results and Discussion – IMRAD, while a commentary on current management practice may use a less structured approach). In all instances consideration should be given to assisting the reader to quickly grasp the flow and content of the article.

For further details about the expected structure of the body of the manuscript, see below - Types of Manuscript – some general guidelines.

Major and secondary headings

Major and secondary headings should be left justified in lower case and in bold.

Figures, tables and illustrations

Figures, tables and illustrations should be:

- of high quality;
- meet the 'stand-alone' test;
- inserted in the preferred location;
- numbered consecutively; and
- appropriately titled.

Copyright

For any figures, tables, illustrations that are subject to copyright, a letter of permission from the copyright holder for use of the image needs to be supplied by the author when submitting the manuscript.

Ethical approval

All submitted articles reporting studies involving human/or animal subjects should indicate in the text whether the procedures covered were in accordance with National Health and Medical Research Council ethical standards or other appropriate institutional or national ethics committee. Where approval has been obtained from a relevant research ethics committee, the name of the ethics committee must be stated in the Methods section. Participant anonymity must be preserved and any identifying information should not be published. If, for example, an author wishes to publish a photograph, a signed statement from the participant(s) giving his/her/their approval for publication should be provided.

References

References should be typed on a separate page and be accurate and complete.

The Vancouver style of referencing is the style recommended for publication in the APJHM. References should be numbered within the text sequentially using Arabic numbers in square brackets. [1] These numbers should appear after the punctuation and correspond with the number given to a respective reference in your list of references at the end of your article.

Journal titles should be abbreviated according to the abbreviations used by PubMed. These can be found at: http://www.ncbi.nih.gov/entrez/query.fcgi. Once you have accessed this site, click on 'Journals database' and then enter the full journal title to view its abbreviation (eg the abbreviation for the 'Australian Health Review' is 'Aust Health Rev'). Examples of how to list your references are provided below:

Books and Monographs

1. Australia Institute of Health and Welfare (AIHW). Australia's health 2004. Canberra: AIHW; 2004.
2. New B, Le Grand J. Rationing in the NHS. London: King's Fund; 1996.

Chapters published in books

3. Mickan SM, Boyce RA. Organisational change and adaptation in health care. In: Harris MG and Associates. Managing health services: concepts and practice. Sydney: Elsevier; 2006.

Journal articles

4. North N. Reforming New Zealand's health care system. Intl J Public Admin. 1999; 22:525-558.
5. Turrell G, Mathers C. Socioeconomic inequalities in all-cause and specific-cause mortality in Australia: 1985-1987 and 1995-1997. Int J Epidemiol. 2001;30(2):231-239.

References from the World Wide Web

6. Perneger TV, Hudelson PM. Writing a research article: advice to beginners. Int Journal for Quality in Health Care. 2004;191-192. Available: <http://intqhc.oxfordjournals.org/cgi/content/full/16/3/191>(Accessed 1/03/06)

Further information about the Vancouver referencing style can be found at http://www.bma.org.uk/ap.nsf/content/LIBReferenceStyles#Vancouver

Types of Manuscript - some general guidelines

1. Analysis of management practice (eg, case study)

Content

Management practice papers are practitioner oriented with a view to reporting lessons from current management practice.

Abstract

Structured appropriately and include aim, approach, context, main findings, conclusions.
Word count: 200 words.

Main text

Structured appropriately. A suitable structure would include:

- Introduction (statement of problem/issue);
- Approach to analysing problem/issue;
- Management interventions/approaches to address problem/issue;
- Discussion of outcomes including implications for management practice and strengths and weaknesses of the findings; and
- Conclusions.

Word count: general guide - 2,000 words.

References: maximum 25.

2. Research article (empirical and/or theoretical)

Content

An article reporting original quantitative or qualitative research relevant to the advancement of the management of health and aged care services organisations.

Abstract

Structured (Objective, Design, Setting, Main Outcome Measures, Results, Conclusions).

Word count: maximum of 300 words.

Main text

Structured (Introduction, Methods, Results, Discussion and Conclusions).

The discussion section should address the issues listed below:

- Statement of principal findings;
- Strengths and weaknesses of the study in relation to other studies, discussing particularly any differences in findings;
- Meaning of the study (eg implications for health and aged care services managers or policy makers); and
- Unanswered questions and future research.
  Two experienced reviewers of research papers (viz, Doherty and Smith 1999) proposed the above structure for the discussion section of research articles. [2]

Word count: general guide 3,000 words.

References: maximum of 30.

NB: Authors of research articles submitted to the APJHM are advised to consult 'Writing a research article: advice to beginners' by Perneger and Hudelson (2004) and available at: <http://intqhc.oxfordjournals.org/cgi/content/full/16/3/191> This article contains two very useful tables: 1) 'Typical structure of a research paper' and 2) 'Common mistakes seen in manuscripts submitted to this journal'. [3]

3. Research note

Content

Shorter than a research article, a research note may report the outcomes of a pilot study or the first stages of a large complex study or address a theoretical or methodological issue etc. In all instances it is expected to make a substantive contribution to health management knowledge.

Abstract

Structured (Objective, Design, Setting, Main Outcome Measures, Results, Conclusions).

Word count: maximum 200 words.

Main text

Structured (Introduction, Methods, Findings, Discussion and Conclusions).

Word count: general guide 2,000 words.

As with a longer research article the discussion section should address:

- A brief statement of principal findings;
- Strengths and weaknesses of the study in relation to other studies, discussing particularly any differences in findings;
- Meaning of the study (eg implications for health and aged care services managers or policy makers); and
- Unanswered questions and future research.

References: maximum of 25.

NB: Authors of research notes submitted to the APJHM are advised to consult 'Writing a research article: advice to beginners' by Perneger and Hudelson (2004) and available at: <http://intqhc.oxfordjournals.org/cgi/content/full/16/3/191> This article contains two very useful tables: 1) 'Typical structure of a research paper' and 2) 'Common mistakes seen in manuscripts submitted to this journal'. [3]

4. Review article (eg policy review, trends, meta-analysis of management research)

Content

A careful analysis of a management or policy issue of current interest to managers of health and aged care service organisations.

Abstract

Structured appropriately.

Word count: maximum of 300 words.

Main text

Structured appropriately and include information about data sources, inclusion criteria, and data synthesis.

Word count: general guide 3,000 words.

References: maximum of 50

5. Viewpoints, interviews, commentaries

Content

A practitioner oriented viewpoint/commentary about a topical and/or controversial health management issue with a view to encouraging discussion and debate among readers.

Abstract

Structured appropriately.

Word count: maximum of 200 words.

Main text

Structured appropriately.

Word count: general guide 2,000 words.

References: maximum of 20.

6. Book review

Book reviews are organised by the Book Review editors. Please send books for review to: Book Review Editors, APJHM, ACHSM, PO Box 341, NORTH RYDE, NSW 1670. Australia.

Covering Letter and Declarations

The following documents should be submitted separately from your main manuscript:

Covering letter

All submitted manuscripts should have a covering letter with the following information:

- Author/s information, Name(s), Title(s), full contact details and institutional affiliation(s) of each author;
- Reasons for choosing to publish your manuscript in the APJHM;
- Confirmation that the content of the manuscript is original. That is, it has not been published elsewhere or submitted concurrently to another/other journal(s).

Declarations

1. Authorship responsibility statement

Authors are asked to sign an 'Authorship responsibility statement'. This document will be forwarded to the corresponding author by ACHSM on acceptance of the manuscript for publication in the APJHM. This document should be completed and signed by all listed authors and then faxed to: The Editor, APJHM, ACHSM (02 9878 2272).

Criteria for authorship include substantial participation in the conception, design and execution of the work, the contribution of methodological expertise and the analysis and interpretation of the data. All listed authors should approve the final version of the paper, including the order in which multiple authors' names will appear. [4]

2. Acknowledgements

Acknowledgements should be brief (ie not more than 70 words) and include funding sources and individuals who have made a valuable contribution to the project but who do not meet the criteria for authorship as outlined above. The principal author is responsible for obtaining permission to acknowledge individuals.

Acknowledgement should be made if an article has been posted on a Website (eg, author's Website) prior to submission to the Asia Pacific Journal of Health Management.

3. Conflicts of interest

Contributing authors to the APJHM (of all types of manuscripts) are responsible for disclosing any financial or personal relationships that might have biased their work. The corresponding author of an accepted manuscript is requested to sign a 'Conflict of interest disclosure statement'. This document will be forwarded to the corresponding author by ACHSM on acceptance of the manuscript for publication in the APJHM. This document should be completed and signed and then faxed to: The Editor, APJHM, ACHSM (02 9878 2272).

The International Committee of Medical Journal Editors (2006) maintains that the credibility of a journal and its peer review process may be seriously damaged unless 'conflict of interest' is managed well during writing, peer review and editorial decision making. This committee also states:

'A conflict of interest exists when an author (or author's institution), reviewer, or editor has a financial or personal relationships that inappropriately influence (bias) his or her actions (such relationships are also known as dual commitments, competing interests, or competing loyalties). The potential for conflict of interest can exist whether or not an individual believes that the relationship affects his or scientific judgment.

Financial relationships (such as employment, consultancies, stock ownership, honoraria, paid expenses and testimony) are the most easily identifiable conflicts of interest and those most likely to undermine the credibility of the journal, authors, and science itself...' [4]

Criteria for Acceptance of Manuscript

The APJHM invites the submission of research and conceptual manuscripts that are consistent with the mission of the APJHM and that facilitate communication and discussion of topical issues among practicing managers, academics and policy makers.

Of particular interest are research and review papers that are rigorous in design, and provide new data to contribute to the health manager's understanding of an issue or management problem. Practice papers that aim to enhance the conceptual and/or coalface skills of managers will also be preferred.

Only original contributions are accepted (ie the manuscript has not been simultaneously submitted or accepted for publication by another peer reviewed journal – including an E-journal).

Decisions on publishing or otherwise rest with the Editor following the APJHM peer review process. The Editor is supported by an Editorial Advisory Board and an Editorial Committee.

Peer Review Process

All submitted research articles and notes, review articles, viewpoints and analysis of management practice articles go through the standard APJHM peer review process.

The process involves:

1. Manuscript received and read by Editor APJHM;
2. Editor with the assistance of the Editorial Committee assigns at least two reviewers. All submitted articles are blind reviewed (ie the review process is independent). Reviewers are requested by the Editor to provide quick, specific and constructive feedback that identifies strengths and weaknesses of the article;
3. Upon receipt of reports from the reviewers, the Editor provides feedback to the author(s) indicating the reviewers' recommendations as to whether it should be published in the Journal and any suggested changes to improve its quality.

For further information about the peer review process see Guidelines for Reviewers available from the ACHSM website at www.achse.org.au.

Submission Process

All contributions should include a covering letter (see above for details) addressed to the Editor APJHM and be submitted either:

(Preferred approach)

1) Email soft copy (Microsoft word compatible) to journal@achse.org.au

   Or

2) in hard copy with an electronic version (Microsoft Word compatible) enclosed and addressed to: The Editor, ACHSM APJHM, PO Box 341, North Ryde NSW 1670;

All submitted manuscripts are acknowledged by email.

NB

All contributors are requested to comply with the above guidelines. Manuscripts that do not meet the APJHM guidelines for manuscript preparation (eg word limit, structure of abstract and main body of the article) and require extensive editorial work will be returned for modification.

References

1. Hayles, J. Citing references: medicine and dentistry, 2003;3-4. Available: <http://www.library.qmul.ac.uk/leaflets/june/citmed.doc> (Accessed 28/02/06)
2. Doherty M, Smith R. The case for structuring the discussion of scientific papers. BMJ. 1999;318:1224-1225.
3. Perneger TV, Hudelson PM. Writing a research article: advice to beginners. Int Journal for Quality in Health Care. 2004;191-192. Available: <http://intqhc.oxfordjournals.org/cgi/content/full/16/3/191> (Accessed 1/03/06)
4. International Committee of Medical Journal Editors. Uniform requirements for manuscripts submitted to biomedical journals. ICMJE. 2006. Available: <http://www.icmje.org/> (Accessed 28/02/06).

Other references consulted in preparing these Guidelines
Evans MG. Information for contributors. Acad Manage J. Available: <http://aom.pace.edu/amjnew/contributor_information.html> (Accessed 28/02/06)

Health Administration Press. Journal of Health care Management submission guidelines. Available: <http://www.ache.org/pubs/submisjo.cfm> (Accessed 28/02/06)

International Journal for Quality in Health Care. Instructions to authors, 2005. Available: <http://www.oxfordjournals.org/intqhc/for_authors/general.html> (Accessed 28/02/06)

The Medical Journal of Australia. Advice to authors submitting manuscripts. Available: <http://www.mja.com.au/public/information.instruc.html> (Accessed 28/02/06)

Further information about the Asia Pacific Journal of Health Management can be accessed at: www.achse.org.au.

About the Australasian College of Health Service Management

ACHSM (formerly Australian College of Health Service Executives) was established in 1945 to represent the interests of health service managers and to develop their expertise and professionalism. Today, the college is the leadership and learning network for health professionals in management across the full range of health and aged care service delivery systems in Australia and New Zealand and the Asia Pacific with some 3,000 members from both public and private sector organisations and non-government and not-for-profit organisations.

ACHSM aims to develop and foster excellence in health service management through the promotion of networking, the publication of research, and through its educational and ongoing professional development activities, including accreditation of tertiary programs in health service management, mentoring and learning sets.

ACHSM has Branches in all Australian States and Territories, New Zealand and Hong Kong. Memoranda of Understanding link ACHSM with other health management bodies in the Asia Pacific. As an international organisation, ACHSM is able to draw upon the experiences of researchers and managers in Australia, New Zealand, Hong Kong and other countries within the region to give readers valuable insights into management issues and approaches in a range of cultures and jurisdictions.

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Australasian College of Health Service Management
PO BOX 671, GLADESVILLE NSW 1675
Telephone: 61 2 8753 5100 Facimile 61 2 9816 2255
Email: achsm@achsm.org.au Web: www.achsm.org.au