

# Associations between patient experiences and clinical outcomes: a cross-sectional data linkage study of the Australian private healthcare sector

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## INTRODUCTION

There is a growing demand internationally to evaluate patient experiences of healthcare services and to publicly report this information to drive quality improvement activities and promote patient choice.<sup>1 2</sup> Increasingly, results of patient experience surveys are being linked to hospital funding—for example, through pay-for-performance programme.<sup>3 4</sup> However, it is unclear whether patient experience is an accurate surrogate marker of good clinical outcomes. As the use of patient experience measures grows, it is important for patients, providers and funders to understand whether good patient experience correlates with improved outcomes.

The research literature is inconsistent in showing an association between patient experiences and clinical outcomes. Some studies demonstrate better patient experiences associated with lower rates of hospital readmissions,<sup>5–7</sup> complications<sup>8–10</sup> and mortality<sup>7</sup>; others report no such association.<sup>11–14</sup> Some of this variation may be attributed to the types of patient experience domains examined (eg, overall hospital rating, provider communication or hospital environment). Some, patient experience domains — such as communication with nurses and doctors — have been found to be more strongly associated with clinical outcomes than others.<sup>5 6 9</sup>

To better understand this relationship and to assess whether patient experience is a useful surrogate marker for clinical outcomes, we examined associations between patient experience domains and clinical outcomes among private inpatients of Australian hospitals. A positive association would suggest that these measures improve in tandem with each other. A negative association would caution against improving one measure at the expense of another. No association would suggest that they are

independent measures of quality of care, each warranting individual attention.

## METHODS

Secondary analysis was undertaken of a cross-sectional, de-identified Australian private health insurer's patient perspectives of care survey (the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey) linked to inpatient hospital records. The HCAHPS survey measures 11 domains using 25 questions: nurse communication; doctor communication; responsiveness of hospital staff; pain management; communication about medicines; discharge information; care transition; hospital cleanliness; quietness of the hospital environment; hospital rating and willingness to recommend hospital.<sup>15</sup> Patients, who were admitted to hospitals in 2016 and 2017, had a valid email address and consented to receiving marketing materials (as recorded in the insurer's database), were approached to complete an online HCAHPS survey 6 weeks after discharged. Responses were converted into a linear scale—that is, least positive response to most positive were assigned numerical values and then transformed to a 0–100 scale. The linear mean score for each domain was calculated by combining the relevant questions. Higher scores represented better patient experiences. Clinical outcomes, gained from the linked hospital records, included the following: 14-day readmission; 28-day readmission; hospital-acquired complications as defined by the Australia Commission on Safety and Quality in Healthcare<sup>16</sup> and length of stay.

To account for patient-mix, the linear mean score for each domain was adjusted for gender, age, education, admission via emergency department, overall health, overall mental health and subspeciality. T-tests and



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Pearson correlations assessed the association between each domain and clinical outcomes. Ethics approval was granted by The University of Melbourne School of Population and Global Health Human Ethics Advisory Group.

## RESULTS

In total, 96032 patients from 692 hospitals were approached and 24705 completed the HCAHPS survey (26% response rate). The data linkage was limited to medical specialties that comprised the majority of the insurer's volume and benefit outlays. Demographic and clinical characteristics of the 4018 respondents are described in [table 1](#). While New South Wales is the most populous state, the majority of respondents resided in Victoria and Queensland. The high proportion of hospital stays for orthopaedic surgery is not surprising given that such procedures are commonly performed 'electively' (non-emergency) and elective surgery is most commonly undertaken on private patients claiming private health insurance rebates.

[Table 2](#) provides T-tests and Pearson correlations analyses to test the associations between the HCAHPS domains and the defined clinical outcomes. Significant associations were found between two of the elements: care transition and 28-day readmission; and pain management and hospital-acquired complication. This means that patients readmitted within 28 days were more likely to be satisfied with their care transition from hospital than those who were not readmitted. Similarly, patients with a hospital-acquired complication were more likely to be satisfied with the way their pain was managed than those who did not have a complication. No significant associations were found between other patient experience domains and clinical outcomes.

## DISCUSSION

The absence of many associations between patient experience domains and clinical outcomes in our study, with the exception of two, suggests that patient experiences should not be viewed as a surrogate marker of good clinical outcomes. Patient experience appears to be a separate quality measure that does not necessarily reflect the safety and effectiveness of care delivered by a hospital. It appears that patients can be satisfied with their care yet experience adverse outcomes such as complication or readmission after discharge that would be classified as non-favourable outcomes and largely considered by funders (insurers/government) to be an indicator of a performance failure.

The results highlight that 28-day readmission can be associated with increased patient satisfaction. Patients who were readmitted were more likely to be satisfied with their care transition than those who were not readmitted. The significant association between pain management and hospital acquired complications indicates patients tended to be more satisfied with their pain management than those without complications. This is consistent

**Table 1** Demographic and clinical characteristics of the sample (n=4018)

	N (%)
<b>Gender</b>	
Female	2343 (58.3%)
<b>Mean age (SD)</b>	
	61.72 (16.06)
<b>Education</b>	
No formal schooling/primary school	98 (2.4%)
Secondary education/vocational training	1865 (46.4%)
Diploma and advance diploma	637 (15.9%)
Bachelor degree	709 (17.6%)
Graduate diploma and Graduate certificate	261 (6.5%)
Postgraduate degree	448 (11.1%)
<b>Language mainly spoken at home</b>	
English	3839 (95.5%)
<b>State*</b>	
Victoria	1227 (30.5%)
Queensland	1002 (24.9%)
New South Wales	908 (22.6%)
Western Australia	424 (10.6%)
South Australia	211 (5.3%)
Australian Capital Territory/Northern Territory/Tasmania	248 (6.2%)
<b>Hospital type</b>	
Private	3561 (88.6%)
Public	457 (11.4%)
<b>Subspeciality</b>	
Orthopaedics	882 (22.0%)
General surgery	453 (11.3%)
Cardiology	398 (9.9%)
Obstetrics	241 (6.0%)
Urology	264 (6.6%)
Breast/gastroenterology/ophthalmology	146 (3.6%)
Others	1634 (40.7%)
<b>Mean length of stay (SD)</b>	
	3.71 (2.44)
<b>14-day readmission</b>	
	193 (4.8%)
<b>28-day readmission</b>	
	319 (7.9%)
<b>Hospital-acquired complication†</b>	
	89 (2.2%)

\*Missing 1.

†Includes pressure injury; falls resulting in fracture or intracranial injury; healthcare-associated infection; surgical complications requiring unplanned return to theatre; unplanned intensive care unit admission; respiratory complications; venous thromboembolism; renal failure; gastrointestinal bleeding; medication complications; delirium; persistent incontinence; malnutrition; cardiac complications; third-degree and fourth-degree perineal laceration during delivery and; neonatal birth trauma.

with the high pain and high satisfaction paradox which suggests that patients who report moderate to severe pain intensity also reported being satisfied with their pain

**Table 2** Associations between HCAHPS domains and clinical outcomes

HCAHPS domains	14-day readmission			28-day readmission			Hospital-acquired complication*			Length of stay	
	No (mean score)	Yes (mean score)	P value	No (mean score)	Yes (mean score)	P value	No (mean score)	Yes (mean score)	P value	r	P value
Nurse communication	88.81	89.39	0.62	88.83	88.90	0.94	88.82	89.53	0.68	0.00	0.98
Doctor communication	96.14	96.65	0.64	96.09	97.03	0.28	96.11	98.49	0.14	0.01	0.49
Responsiveness of hospital staff	83.50	85.62	0.22	83.50	84.74	0.36	83.52	87.06	0.15	0.00	0.96
Pain management	89.19	90.28	0.46	89.23	89.33	0.94	<b>89.15</b>	<b>93.56</b>	<b>0.04</b>	0.00	0.83
Communication about medicines	79.54	81.11	0.59	79.37	82.59	0.16	79.71	74.87	0.26	-0.02	0.46
Discharge information	82.10	85.69	0.16	82.05	84.92	0.15	82.30	81.25	0.78	-0.00	0.72
Care transition	83.68	85.66	0.12	<b>83.57</b>	<b>86.10</b>	<b>0.01</b>	83.76	84.25	0.79	-0.02	0.20
Cleanliness of the hospital environment	94.35	93.69	0.64	94.36	93.91	0.69	94.35	92.86	0.47	-0.01	0.61
Quietness of the hospital environment	75.87	77.40	0.45	75.76	78.03	0.15	76.02	72.49	0.23	-0.01	0.37
Hospital rating	85.82	85.96	0.91	85.79	86.19	0.68	85.84	85.29	0.76	0.01	0.70
Willingness to recommend hospital	89.97	90.54	0.72	89.94	90.64	0.58	90.01	89.32	0.77	0.00	0.98

\*Includes pressure injury; falls resulting in fracture or intracranial injury; healthcare-associated infection; surgical complications requiring unplanned return to theatre; unplanned intensive care unit admission; respiratory complications; venous thromboembolism; renal failure; gastrointestinal bleeding; medication complications; delirium; persistent incontinence; malnutrition; cardiac complications; third-degree and fourth-degree perineal laceration during delivery and neonatal birth trauma.

HCAHPS, Hospital Consumer Assessment of Healthcare Providers and Systems.

management.<sup>17</sup> The results are consistent with several previous studies which found that hospitals with higher complication or readmission rates had better patient experiences, although the results were not statistically significant.<sup>11–14</sup> This may be a consequence of greater care provided by hospital staff to patients experiencing adverse outcomes or service recovery efforts by the hospitals. Service recovery is the process of addressing concerns raised by consumers in response to a service failure. Effective service recovery can improve service delivery and increase customer loyalty and satisfaction despite the service failure.<sup>18</sup>

The findings should be interpreted in the context of study design limitations. The availability of a large number of patient experience domains and clinical outcomes necessitated multiple testing, increasing the probability of detecting significant associations by chance alone. Respondents were likely to have experienced the clinical outcome prior to the conduct of the survey, as such there may have been some unmeasured confounding effects influencing their responses. In addition, the HCAHPS data and linked data did not include contextual information on potential confounders, such as the strength of the patient's support networks, sociocultural and economic status, the suitability of their home environment for after-hospital care, or their adherence to clinical recommendations. Australia is a multi-cultural country, yet the high proportion of respondents who spoke mainly English suggests a potentially poor response rate among culturally diverse people. The study also took place in private hospitals and generalisability to the public sector is unknown.

The results warrant cautious interpretation and further evaluation, but they suggest that patient experience and clinical outcomes are likely to represent distinct aspects of quality of care. This is not to imply that patient experience is not a valuable and valid measure, but rather that it should be seen for what it is: a marker of patient-centred care and good customer service and not a proxy for clinical outcomes. Improvement initiatives should include independent measurement of both measures to obtain a comprehensive evaluation of care.

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