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Benefits of patient education in surgery

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ABSTRACT

Background: Research has found that 48 % of patients are anxious before surgery but patient education which involves preparing them about what to expect is associated with higher satisfaction after surgery. Patient satisfaction is important because previous research found that patients who had surgery in hospitals with the highest quartile of satisfaction had lower relative risk reductions of 11–13 % in 30-day postoperative mortality, minor complications, and failure to rescue. In using patient satisfaction as a metric in surgery, it is not yet known whether exceptions should be made for emergencies and coronavirus patients because of restricted opportunities for patient education.

Methods: This study analysed the survey responses of 38,689 patients who had surgery or clinical procedures from UK NHS hospitals. Regression analysis found that patient education (captured in patients' interactions with surgeons, physicians, and other staff e.g., preparing them about what to expect from surgery or clinical procedures) significantly increased patient satisfaction. It explained 34.9 %–49.7 % of adjusted variance in patient satisfaction. Multivariate analysis of variance found that patient satisfaction was lower after emergencies and among patients in coronavirus wards, likely because of restricted time or opportunities for patient education.

Conclusions: This study shows the benefits of patient education in surgery which prepares patients about what to expect. However, patient satisfaction should not be used as an isolated metric after emergency surgery and that involving coronavirus patients because of restricted time or opportunity for patient education.

1. Introduction

48 % of patients are anxious before surgery [1] whereas anxious patients are less likely to feel satisfied with their providers [2]. Preoperative anxiety is associated with lower satisfaction, with one study finding that for each 10-point increase in Patient-Reported Outcomes Measurement Information System (PROMIS) anxiety, patient satisfaction decreased by 16 % [2]. Patient satisfaction is important in surgery because a study of 103,866 patients who had surgery in 180 US hospitals found that hospitals in the highest quartile of patient satisfaction had patients with lower odds of 0.82–0.87 in postoperative mortality, failure to rescue and minor complications [3]. This was a relative risk reduction of 11 % in mortality, 12 % in minor complications, and 13 % in failure to rescue. These associations might reflect the good quality of the hospitals in a range of ways. One of the explanations may be that more satisfied patients are more likely to have received better patient education e.g., being adequately prepared about what to expect from surgery, what to do after discharge, and they might be more likely to have learnt warning signs to look out for that may increase the risk of postoperative mortality or complications. One study found that patients who underwent emergency abdominal surgery and were well informed about the risks or benefits, and what to do on discharge, reported higher satisfaction [4]. However, that study only had 68 patients therefore a larger study is needed, as is research representing patients who underwent other types of surgery.

The evidence about the link between patient satisfaction and mortality [3] is supported by other studies which have found that satisfaction is associated with better odds of recovery in terms of physical functioning [2,5], quality of life [5], mental/physical quality of life, adherence to prescribed medication and improvement [6]. These variables are likely to be interlinked because satisfied patients tend to have received better patient education [6], reducing the risk of mortality and complications because patients know about postoperative symptoms to watch out for, when to seek help, and the importance of adhering to clinical advice or prescribed medication. Indeed, satisfied patients tend to be more compliant with treatment recommendations and medication [6], which might in turn explain better odds of recovery. Patient education might also alleviate preoperative anxiety [7], and is associated

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with higher levels of patient satisfaction after surgery [4].

However, adequate patient education before surgery and other clinical procedures might not be possible in emergencies and circumstances of infection control (e.g., SARS-CoV-2 wards). This might explain the lower patient satisfaction found among those who had emergency surgery compared to planned surgery [8]. Surgeons likely have more time to provide information about what to expect, warning signs to look out for, and to answer patients' questions before planned surgery, compared to emergencies. There tends to be less emphasis on positive communication behaviours within emergency contexts [9], but there is little research about patients' experiences after emergency surgery except for a few studies [4,8].

To my knowledged, there is little research investigating patient education and satisfaction among those in SARS-CoV-2 wards during the pandemic in 2020, yet it is plausible that the risk of infection and use of special protective equipment together with the clinical characteristics of patients (e.g., sedation) meant that patient education opportunities were limited because infection control restricted interactions. It is not yet known, either, whether such patients were more or less likely to have received patient education after emergency surgery, compared to planned surgery. Variations would be understandable in the difficult clinical circumstances, but need to be investigated to shed light on whether hospitals should be cautious about using patient education and satisfaction as isolated metrics without acknowledging the difficulties surgeons and physicians face in emergencies and circumstances of infection control.

2. Methods and materials

This study selected 38,689 patients from the Adult Inpatient Survey of all 137 acute National Health Service (NHS) hospital trusts in the United Kingdom who had surgery or clinical procedures. The survey was conducted by NHS trusts on behalf of the Care Quality Commission [10]. This study used a cross-sectional design to investigate the associations between patient education (captured through interactions with surgeons, physicians, and other staff) and patient satisfaction. This study then used a naturalistic 2x2 experiment design to examine how admission status (emergency versus planned patients), and the ward type (patients in SARS-CoV-2 wards versus other patients) predicted patient satisfaction. This study also examined the interaction between these two independent variables.

The data were nationally representative because all NHS trusts in the country took part, and each trust submitted data from 1250 patients. Between January and May 2021, each NHS trust invited patients who met the inclusion criteria indicated below to complete an online or postal survey [10] about their experiences while in hospital in 2020, which was during the first few months of the SARS-CoV-2 pandemic in the United Kingdom. Patients eligible for the survey spent at least one night in hospital at an acute trust, were discharged in November 2020 (or a period before that) and were aged 16 years or older. Patients excluded from the survey by NHS trusts were those admitted for pregnancy-related reasons, psychiatric reasons, private patients, NHS patients treated at private hospitals, and certain other criteria (e.g., not having an address).

Patients were eligible for inclusion in the present study if they had undergone surgery or a clinical procedure. The way that the Adult Inpatient Survey question was phrased by those who created it within the NHS/CQC does not enable researchers to select only those patients who had surgery because they combined them with patients who had clinical procedures. There were 73,015 patients in the Adult Inpatient Survey, of which 38,689 patients were eligible for the present study. The survey asked questions which captured patient education through interactions which can be categorised as follows. First were questions which evaluated physician-patient interactions: *"When you asked doctors questions, did you get answers you could understand?" "Did you have confidence and trust in the doctors treating you?"* and *"When doctors spoke about your care in front of you, were you included in the conversation?"* which had good internal reliability, $\alpha = 0.70$. Patients were asked to respond to those questions by thinking about physicians within the hospital who were not in the accident/emergency section of the hospital and therefore the survey evaluated patients' experiences of physicians in other specialties such as surgery and internal medicine. Next were questions which evaluated staff-patient interactions: *"To what extent did staff looking after you involve you in decisions about your care and treatment?" "Did you feel able to talk to members of hospital staff about your worries and fears?"* and "*Were you able to get a member of staff to help you when you needed attention?"* This group of questions had good internal reliability, $\alpha = 0.70$. Next were questions which asked patients about their experiences regarding their patient education about surgery or clinical procedures: *"Beforehand, how well did hospital staff answer your questions about the operations or procedures?"* and *"Beforehand, how well did hospital staff explain how you might feel after you had the operations or procedures?"* Internal reliability was not evaluated because this group only had two questions. Finally, this study evaluated questions about patient satisfaction. One question asked patients whether they felt treated with respect and dignity while in the hospital, and another question asked patients to indicate their rating of their overall experience while in the hospital. A full copy of the Adult Inpatient Survey data and documents by the Care Quality Commission is available online [10].

Multiple regression using SPSS software explored how patient education through physician-patient interactions, staff-patient interactions and concerning surgery/procedures predicted patient satisfaction. Multivariate analysis of variance (MANOVA) investigated the main effect of admission type (emergencies versus planned), main effect of ward type (SARS-CoV-2 versus other), and the interaction effect of admission type with ward type in predicting patient education and satisfaction.

3. Results

Of the 38,689 patients who had surgery or clinical procedures, 19,316 patients (49.9 %) were in hospital under a planned admission, and 19,373 patients (50.1 %) were in hospital because of emergency admissions. Overall, 3314 patients (8.6 %) were in SARS-CoV-2 wards, of which 568 patients were admitted into hospital for planned reasons, and 2746 patients were admitted for emergency reasons. Across the whole sample, patient satisfaction was very high in terms of being treated with respect and dignity whilst in hospital ($M = 1.87$ on a scale of 0–2), and many patients had an overall positive experience of their stay in hospital ($M = 8.60$ on a scale of 0–10). On average, physician-patient experiences were very positive ($M = 1.82$ on a scale of 0–2), staff-patient interactions were positive ($M = 1.90$ on a scale of 0–2.33, where items with different response scales were averaged out), and patient education relating to surgery/clinical procedures was positive ($M = 2.62$ on a scale of 0–3).

MANOVA revealed that admission type significantly predicted all outcomes, $P < 0.001$, and ward type also significantly predicted all outcomes, $P < 0.001$. Patients who stayed in SARS-CoV-2 wards and emergency patients had, on average, less patient education captured through less positive physician-patient interactions, staff-patient interactions, surgery/procedure experiences, and less satisfaction. Multivariate tests (e.g., Pillai's Trace) were all significant, $P < 0.001$. There were significant interactions between the independent variables of admission type and ward type as predictors of all except two outcomes (physician-patient interactions and staff-patient interactions), $P < 0.05$. Emergency patients who stayed in SARS-CoV-2 wards had less positive surgery/procedure experiences, feelings of being treated with dignity and respect, and overall ratings of the satisfaction with their time in hospital. Figs. 1–5 illustrate these findings, which show less patient education and lower satisfaction among patients who had surgery or clinical procedures in emergencies and among patients in SARS-CoV-2 wards.

Multiple regression analysis found that patient education (captured

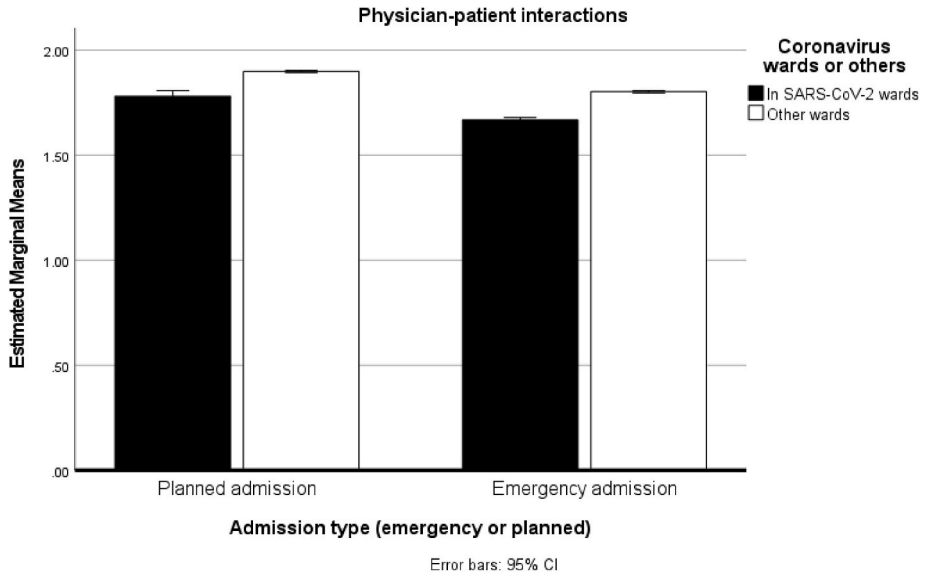

Fig. 1. Shows that patients in other wards had more positive physician-patient interactions than patients in SARS-CoV-2 wards.

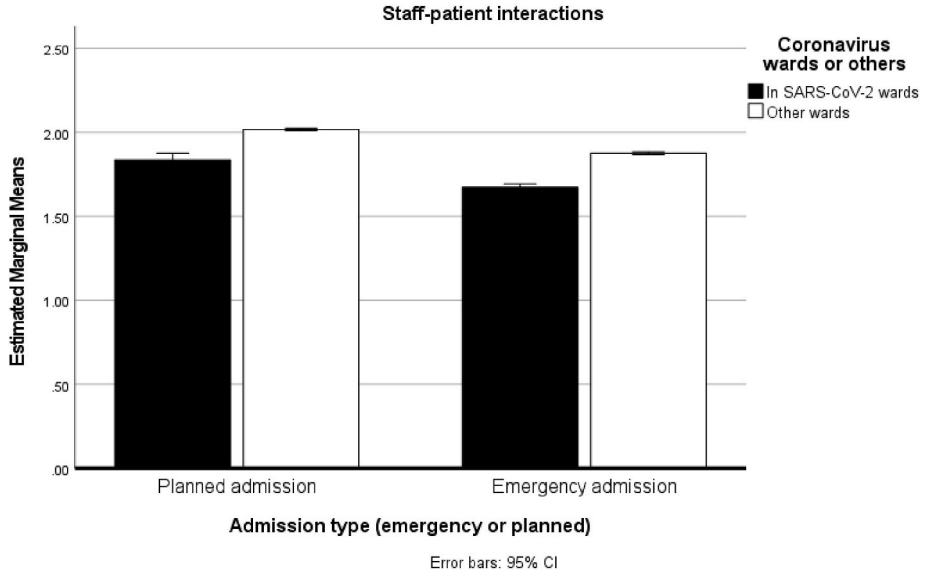

Fig. 2. Shows that patients in other wards had more positive staff-patient interactions than patients in SARS-CoV-2 wards.

through physician-patient interactions, staff-patient interactions, and concerning surgery/procedures) significantly predicted patient satisfaction in terms of their ratings of their time in hospital, $F(3, 36{,}272) = 11{,}959.02$, $p = 0.001$. The predictors explained 49.7 % of the adjusted variance in patient satisfaction. That pattern was replicated for the other indicator of patient satisfaction – their experiences of being treated with dignity and respect, F(3, 36,344) = 6,502,P = 0.001, with an adjusted variance explained of 34.9 %. The multiple regression analyses were repeated in each patient category, and the pattern of significant results was the same. For patients admitted during emergencies, the predictors explained 39 % of the variance in patients feelings treated with dignity and respect (compared to 27 % of the variance among planned patients). The variance explained was 52 % and 43 %, respectively, for patients' overall ratings of their stay in hospital. This means that patient education (captured in different types of interactions with surgeons, physicians, and staff) predicted more variance in patient satisfaction after emergency admissions compared to planned admissions.

4. Discussion

Patient education before surgery or clinical procedures was associated with higher satisfaction, likely because patients had less preoperative anxiety and felt better prepared patients about what to expect, and what might happen after the surgery/procedure. Patient education should answer questions and give patients information in a way they can understand. The findings that patient education is associated with higher satisfaction supports previous research in emergency abdominal surgery [4], and other fields [6], in a large nationally representative UK NHS sample of patients. This study found less patient education and satisfaction after emergency surgery/procedures and among patients in SARS-CoV-2 wards. This was likely because surgeons and other staff have limited time to provide sufficient patient education in emergencies, and because infection control restricted the quality of interactions with patients during the pandemic in 2020. Patients in SARS-CoV-2 wards may have been more likely to have been intubated and sedated, giving surgeons and other physicians less opportunities for patient education.

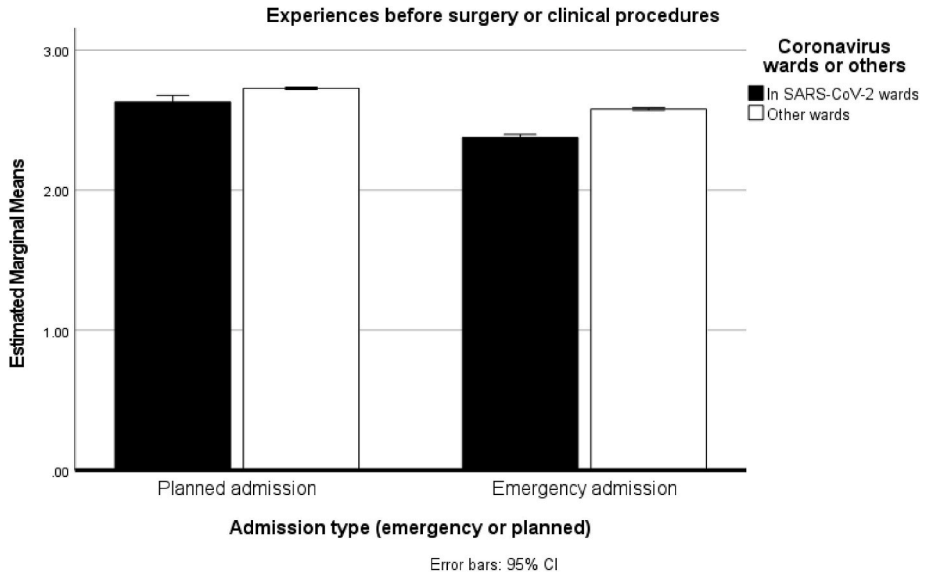

Fig. 3. Shows that patients in other wards had more positive pre-surgery or clinical procedure experiences than patients in SARS-CoV-2 wards. There was an interaction between the two independent variables in that emergency patients in SARS-CoV-2 wards had less positive experiences than patients in other categories.

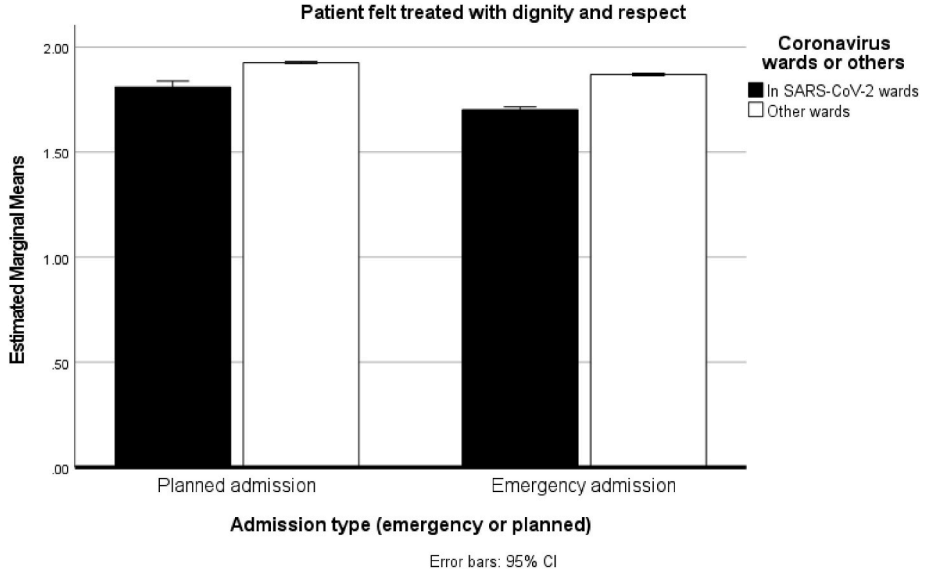

Fig. 4. Shows that patients in SARS-CoV-2 wards felt less treated with dignity and respect patients when admitted in emergencies.

This was more so in cases of SARS-CoV-2 patients admitted in emergencies.

The strengths of the study are the large and nationally representative sample size, and the relatively equal sample sizes in the emergency versus planned categories of patients who underwent surgery or clinical procedures. Another strength of the study is its timing because the data were collected within the first few months of SARS-CoV-2 pandemic in the UK and explores the experiences of patients in SARS-CoV-2 wards at that time. Future research should collect follow-up data which allows a longitudinal investigation of how UK NHS patient education and satisfaction predict 30-day mortality, complications, and failure to rescue after surgery.

Mortality and other outcomes data were not available within the Adult Inpatient Survey because it used a cross-sectional design, therefore future research is needed which should involve long-term follow-up, including linking patient education/satisfaction surveys with health and mortality records. Future research should investigate whether patient education reduces postoperative mortality and complications. If it does, it is plausible that the explanation might lie in the benefits of patient education for better patient adherence to postoperative or post-procedure advice, as well as better knowledge about warning signs to look out for, and when to seek help. Such research can shed light on whether the mortality-related findings from the US study [3] are replicable within the UK, and whether they have an impact on subsequent health outcomes. Country differences should be considered because the average patient satisfaction level in the present study was higher than the average of the 180 hospitals in that US study. Whereas average overall satisfaction was 86 % in the present study, the average in the US study was 68 % [3].

This study cautions against hospitals which use patient satisfaction as an isolated metric with which to evaluate surgery departments because the findings were that patients' medical conditions matter. This was demonstrated in the context of emergencies and infection control. To further investigate the role of patients' medical conditions, it is

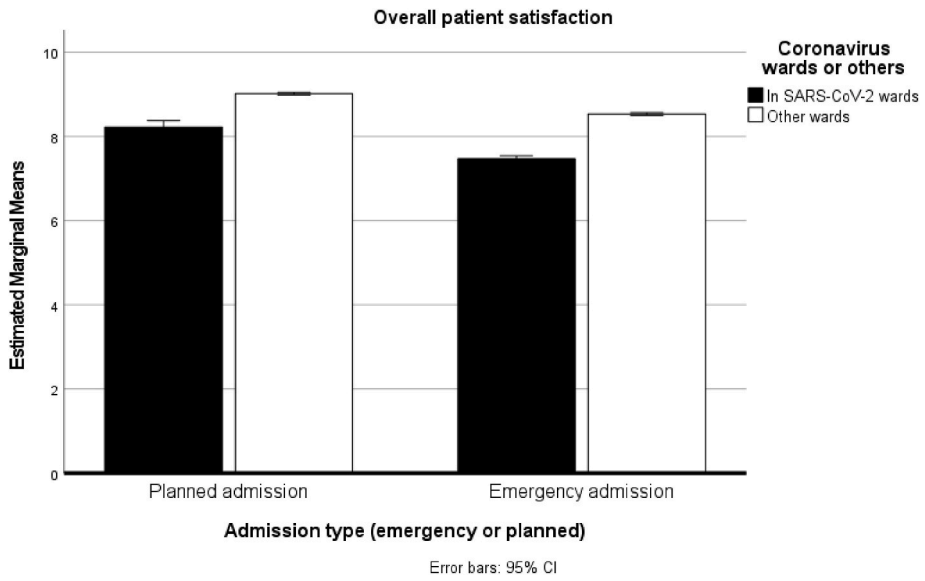

Fig. 5. Shows that patient satisfaction was lower among emergency patients, compared to planned patients, and among patients in SARS-CoV-2 wards compared to those in other wards.

recommended that the NHS/CQC add questions within the Adult Inpatient Survey which ask patients about the type of surgery or clinical procedure that they had, to enable future researchers to select patients based on more specifics. This study also cautions that patient satisfaction is not necessarily representative of the quality of surgery departments, therefore it should not be used as an isolated metric about which to penalise them. One study analysed data from 31 hospitals and found no significant association between patient satisfaction and the safety culture within hospitals [11], therefore, patient satisfaction should not be used as a stand-alone metric without evaluating other indicators of the quality of patient care as well as the context e.g., emergencies.

5. Conclusion

The take-home message is that communicating with patients well makes patients happier, and the other message is that such communication should include educating the patient about what to expect from surgery. The large sample size in this study helps to emphasise the importance of this take-home message. The findings of this study echo growing emphasis on patient education in surgery and recent calls for surgeons to help patients feel better prepared in terms of knowing what to expect from surgery and what to do afterwards [12]. At the same time, policymakers should acknowledge the pressures that surgeons and other clinicians face in emergencies or during infection control, when they cannot communicate with patients as well as they would have liked. The UK government sometimes refers to patient satisfaction as an indicator of how well the NHS is performing [13] but this study cautions policymakers against using patient satisfaction as an isolated metric. They should not use it to evaluate the quality of hospitals or surgical departments without acknowledging the role of unavoidable demands, such as during emergencies and infection control.

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Declaration of interest

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References

[1] Abate SM, Chekol YA, Basu B. Global prevalence and determinants of preoperative anxiety among surgical patients: a systematic review and meta-analysis. Int J Surg Open 2020;1(25):6–16. https://doi.org/10.1016/j.ijso.2020.05.010.
[2] Tyser AR, Gaffney CJ, Zhang C, Presson AP. The association of patient satisfaction with pain, anxiety, and self-reported physical function. J. Bone Jt. Surg. Am. 2018; 100(21):1811. https://doi.org/10.2106/JBJS.17.00372. 11.
[3] Sacks GD, Lawson EH, Dawes AJ, Russell MM, Maggard-Gibbons M, Zingmond DS, Ko CY. Relationship between hospital performance on a patient satisfaction survey and surgical quality. JAMA Surg 2015 Sep;150(9):858–64. https://doi.org/10.1001/jamasurg.2015.1108.
[4] Jones CH, O'Neill S, McLean KA, Wigmore SJ, Harrison EM. Patient experience and overall satisfaction after emergency abdominal surgery. BMC Surg 2017;17(1):1–8. https://doi.org/10.1186/s12893-017-0271-5.
[5] Renzi C, Tabolli S, Picardi A, Abeni D, Puddu P, Braga M. Effects of patient satisfaction with care on health-related quality of life: a prospective study. J Eur Acad Dermatol Venereol 2005;19(6):712–8. https://doi.org/10.1111/j.1468-3083.2005.01301.x.
[6] Dubina MI, O'Neill JL, Feldman SR. Effect of patient satisfaction on outcomes of care. Expert Rev Pharmacoecon Outcomes Res 2009;9(5):393–5. https://doi.org/10.1586/erp.09.45.
[7] Bailey L. Strategies for decreasing patient anxiety in the perioperative setting. AORN J 2010;92(4):445–60. https://doi.org/10.1016/j.aorn.2010.04.017. 1.
[8] Kamau C. Vulnerability of emergency surgery to the working conditions of new doctors. Bull Roy Coll Surg Engl 2016;98(8):354–7. https://doi.org/10.1308/rcsbull.2016.354.
[9] London KS, Druck J, Silver M, Finefrock D. Teaching the emergency department patient experience: needs assessment from the CORD-EM task force. West J Emerg Med 2017;18(1):56. https://doi.org/10.5811/westjem.2016.9.30667.
[10] Care Quality Commission, Ipsos MORI. Acute trusts: Adult inpatient survey, 2020. UK Data Service. SN; 2022. p. 8950. https://doi.org/10.5255/UKDA-SN-8950-1 [data collection].
[11] Lyu H, Wick EC, Housman M, Freischlag JA, Makary MA. Patient satisfaction as a possible indicator of quality surgical care. JAMA Surg 2013 Apr;148(4):362–7. https://doi.org/10.1001/2013.jamasurg.270.
[12] Melstrom LG, Mahuron K, Sun V. What to expect… when you are having surgery. JAMA Surg 2024. https://doi.org/10.1001/jamasurg.2024.0142. Mar 13.
[13] Department of Health and Social Care and The Rt Hon Wes Streeting MP. Former Health Secretary to help government fix health and care. Press release: November 9th. https://www.gov.uk/government/news/former-health-secretary-to-help-government-fix-health-and-care; 2024.