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Feasibility of multimedia animations as preoperative guides for urgent abdominal surgeries in a public hospital in Brazil

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Abstract

Health literacy, culture and language play vital roles in patients' understanding of health issues. Obstacles are more evident in low- and middle-income countries (LMICs), where inadequate patient education levels are higher and hospital resources are lower. This is a prospective pilot study assessing the feasibility of digital preoperative animations as guides for surgical patients. Patients admitted to a public hospital in Brazil for acute cholecystitis or appendicitis were included. Feasibility was represented by acceptability rate and ease of integration with department protocols. Thirty-four patients were included, and 26 patients concluded the intervention (76.5% acceptability rate). Demographic factors seemed to affect the results, indicated by higher acceptability from those with lower education levels, from younger patients and from women. Few studies have evaluated the use of multimedia resources for surgical patients, and no studies assessed the use of animations as digital patient education resources in an LMIC. This study demonstrated that the use of animations for patient education in LMICs is feasible. A step-based approach is proposed to aid the implementation of patient education digital interventions. The use of digital multimedia animations as preoperative guides in LMICs is feasible. It may help improve patient education and promote clinical benefits.

Introduction

The use of new technologies has allowed the training of healthcare professionals to deliver improved health education [1]. Obstacles in health literacy, culture and language have been recognized as significant problems in patient comprehension of health problems and may influence treatment outcomes and follow-up [2–4]. Effective tools to help healthcare professionals educate patients are gradually being implemented. However, these tools show relevant limitations, particularly to patients with barriers to traditional instructional methods, as is the case with patients with low literacy levels [5–7].

Some international organizations such as the World Health Organization have incentivized global efforts to use digital tools for healthcare system strengthening. A plethora of countries—including many low- and middle-income countries (LMICs)—have worked on the development of their policies for digital health programs [8]. Despite the increased interest, digital health is still relatively incipient in LMICs as few programs presented scaled up, long-term implementation and have typically been fragmented and uncoordinated

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[8, 9]. Notwithstanding the growth in efforts to advance digital health globally, computer-based patient education is still primarily applied mainly for the English-speaking world [10]. Sustainable national programs to support global actions in digital health are lacking and no international encouragement strategies are observed [11].

It has been shown that patients may forget up to 80% of healthcare information discussed during clinic visits, and almost half of the information remembered is recalled incorrectly [6, 12]. Patients often forget what they were told and some have difficulty to comprehend the information contained in these leaflets [13]. The use of audiovisual multimedia tools can enhance learning, which may consequently lead to an improvement in treatment outcomes [2, 14, 15]. Digital tools may improve guidance and access to information, as well as provide reassurance and motivation by offering a sense of direction and safety [13, 14]. Additionally, independence and self-care may be enhanced by providing individual empowerment to patients [14]. Studies from low-resource settings have also demonstrated clinical benefits with optimized patient education processes [16].

For surgical patients, preoperative education helps decrease anxiety, increase self-efficacy and support postoperative recovery activities [15, 17–22]. Research has shown the clinical benefits of enhancing preoperative information to patients, which include decreased length of hospital admission, decreased demand for postoperative analgesia and increased patient satisfaction [2, 5, 7, 19, 23]. There has also been evidence of specific anesthetic benefits with improved patient education [24].

Many studies have investigated different aspects of digital health interventions for clinical purposes, but most are related to innovations directed at healthcare professionals. Studies have been performed to analyze the application of such tools for patient education, but most were not in surgical settings. Studies focused on surgical patient education were conducted mainly in elective surgery scenarios and in large part assessed specific interventions during the consent period [25]. By recognizing a need to address the issue of surgical patient education from a digital health lens and a global perspective, this study aims to assess the feasibility of applying a novel patient education tool in a middle-income country with a surgical patient population from a public hospital.

Methodology

Study design and participants

This is a quantitative and qualitative prospective pilot study to assess the feasibility of a disease-specific animated multimedia guides for patients in a public hospital in Brazil. Feasibility was calculated by the acceptability rate of completion of the intervention, which required full engagement in all steps of the study (final number of patients/total number of surgeries). The intervention was considered feasible if more than 50% of patients were compliant with all steps of the study. Other aspects of the implementation process were also taken into consideration for analysis purposes. This study was approved by the Institutional Review Board at McGill University (Montreal, Canada) and the Research Ethics Board at Sao Paulo University (Sao Paulo, Brazil) where certificates of ethical approval were obtained. Appendix A4 presents the certificates of approval. Participation in this study was completely voluntary, and informed consent forms were obtained for every patient.

All cases of cholecystitis and appendicitis were admitted by the general surgery team, and all patients with inclusion criteria for this study were approached to participate. The inclusion criteria were all patients above 18 years of age admitted to the hospital for acute cholecystitis or appendicitis. The excluded patients were those who were discharged from the hospital before the surgery, as well as any patient who presented severe clinical conditions or any comorbidity that determined a relevant degree of cognitive or audiovisual deficit. Minimum sample size for this feasibility study was 30 patients, as suggested by Lancaster *et al*. for a pilot study [26].

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Materials and procedures

The animations were created for two urgent surgical procedures: appendicectomy and cholecystectomy. Videos were available universally, accessed via the web. The video content and platform development were done during a period of 4 months, through a university–industry partnership and reviewed by four experts in the field. To offer a completely virtual experience, a website was created to serve as the platform for the study. The online platform used can be found at https://en.anima.med.br/home, and its screenshots are presented in Appendix A1. The duration of the videos was 8 min 55 s for appendicectomies, while the cholecystectomy animation lasted 9 min 5 s. Appendix A2 exhibits still images of scenes from the videos, and Appendix A3 presents the scripts for the animations. Every image in the animation was reviewed to maintain the entire production appropriate for all ages. Content and language were based exclusively on up-to-date medical literature with limited jargon use. All content was presented in the local language and included closed caption preference. The content was reviewed by local medical experts to produce an evidence-based approach based on local protocols. A sample of the videos used, directly translated to English, can be found at https://vimeo.com/734993061 and https://vimeo.com/734993097.

Participants were offered a tablet device by the department to access the platform but were also allowed to use any personal electronic device of their preference if they so desired. The initial page was composed of a registration to the platform, where the patient would choose a random username for login that could be used in future accesses. Additionally, they were asked their disease (appendicitis or cholecystitis) and baseline demographic information (date of birth, gender and educational level). Then, the platform directed patients to watch the animation, and patient engagement was observed to exclude from feasibility calculation any patient who stopped watching the video before the end. The platform showed disease-specific animations, and characters were personalized to the gender answered by the patient. After the video, patients would answer a questionnaire to assess the acceptability of the tool. Subsequently, participants were automatically put into an anonymous secure online repository. After all steps were concluded and only if they were all complete, the individual access was counted for the feasibility calculation. This step would mark the feasibility of the tool by creating two groups of individuals: those who completed the entire study—thereby representing acceptability of the intervention—and those who did not complete the study. Home access was offered to all participants who wanted to visualize the platform at any moment. Figure 1 demonstrates all the steps in the study to determine the feasibility.

This study used a questionnaire to portray the acceptability of certain aspects of this tool by each participant, composed of a 3-item assessment of acceptability, resulting in five total questions. Additionally, there was a section for comments where the participant could write their impressions of this tool freely. The survey was applied online in the same platform used for other steps of the study. A tab prompted the questionnaire after the visualization of the animation. The answers were automatically stored in a secure database, which could only be viewed by the main researcher as an anonymous data set.

Data collection and analysis

All data were collected prospectively and maintained in a password-protected online database. Data collection and analysis were done with Microsoft Office Excel software licensed version 16. The database was kept as a password-secure Excel document after being downloaded from the online platform. Descriptive statistical calculations and graphs were also done using this software. Finally, statistical inference tests were performed for the purpose of data analysis by using Fisher's exact test for categorical variables and *t*-test for continuous variables.

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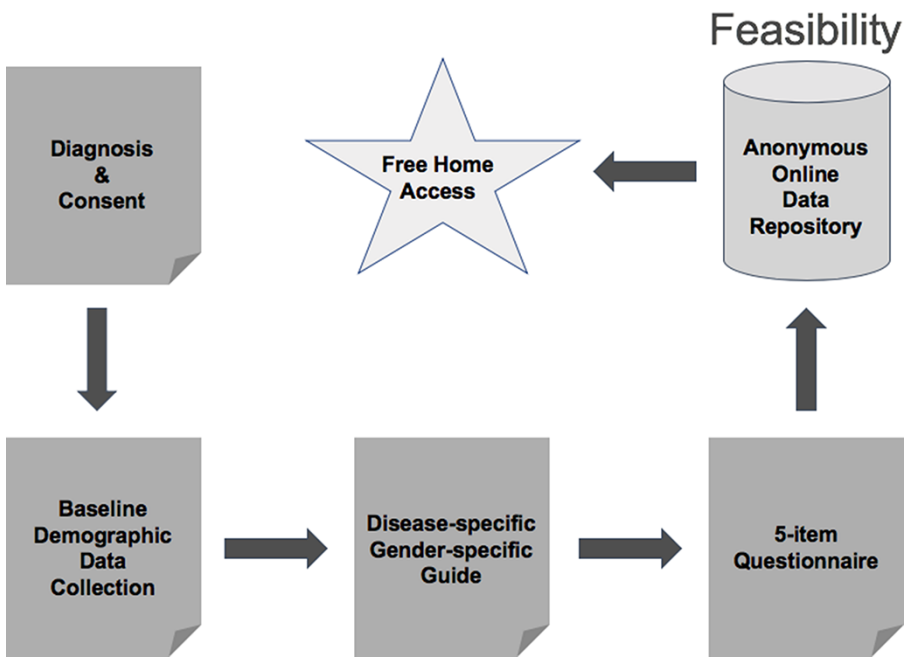


Fig. 1. Study steps.

Results

During a total of 4 months, from December 2019 to April 2020, there were a total of 34 cholecystectomies and appendicectomies registered by the department. All 34 patients fulfilled the inclusion criteria and were enrolled in this study. No patients presented exclusion criteria. Of the total, 20 surgeries were cholecystectomies, representing 59% of cases, while 14 were appendicectomies (41%). Demographic data from all participants were analyzed. The mean age was 45 years, and most of the population was composed of women (59%). Most participants had a high school degree (44%), but some had not completed high school (24%), while others had secondary education (32%). The demographic data of the population is shown in Table I.

Table I. *Demographic data between the groups of surgery types (n = 34)*

Demographics	Total (*n* = 34)	Appendicectomy (*n* = 14)	Cholecystectomy (*n* = 20)
Age	45.2 ± 16.7	41.9 ± 14.9	47.6 ± 17.9
Gender			
Male	14 (41%)	9 (64%)	5 (75%)
Female	20 (59%)	5 (36%)	15 (25%)
Educational level			
Below high school degree	8 (24%)	3 (21%)	5 (25%)
High school degree	15 (44%)	5 (36%)	10 (50%)
Secondary education	11 (32%)	6 (43%)	5 (25%)

Out of all 34 patients enrolled in the study, 26 completed all steps, which constituted an acceptability rate of 76.5% for this tool. All patients who did not complete all steps (eight participants) did, however, enroll in the study and proceeded to watch the videos. The animations were completely watched by six of those eight participants, representing a total of 32 out of 34 participants (94.1%) who watched the guides. The step that was not completed was invariably the questionnaire,

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which constituted unfeasibility of the tool by the established methodological criteria.

The comparative analysis of the two groups of acceptability demonstrated clear differences between them. No statistically significant difference was identified between the two groups. The mean age of the 26 participants who completed all steps of the study was 43 ± 15.8, while the patients who did not complete the study were almost 10 years older ($P = 0.16$). A notable difference was identified in gender ratios between the groups (65% females in the completion group versus 63% males in the non-completion groups with $P = 0.23$). The educational level also presented a marked difference between the two groups ($P = 0.079$). Table II depicts the differences between the demographic data of these two groups.

The analysis of this data established the acceptability rate for each demographic category. While no statistical significance was identified, the acceptability rate presented a decrease as the educational level increased, varying from 100% acceptability rate for those without a high school degree to 54.5% for those with secondary education. Likewise, gender also determined a difference in acceptability rates, as women presented 85% acceptability, while men remained at a 64.3% rate. The type of surgery did not present an effect in the acceptability rate. Table III shows the rate of acceptability for each demographic category. These elements seem to indicate that this tool may have higher acceptability from those populations with lower education levels, from younger patients and from women.

The results of the questionnaire completed by the 26 patients who formed the feasibility group also demonstrated a high degree of acceptability of this tool by the participants. For the question 'Did you understand the information provided to you?', the totality of participants answered 'Yes.' This was also the percentage of 'Yes' identified for the question 'Did you like the animation?' Additionally, a total of 12 comments from participants were registered, which represents 46% of all patients who completed the study. Out of these 12 comments, 83.3% were positive reviews of the tool. One of the negative reviews was provided by the first participant enrolled and related to internet connectivity. The second negative comment was associated with anxiety due to the wait time for surgery.

Assessment regarding the ease of integration to local protocols was performed through interviews with the healthcare professionals in the department. A high degree of acceptability was also identified among local staff and department head. No issues related to the integration to department protocols or

Table II. *Demographic data between the groups of study completion ($n = 34$)*

Demographics	Completed study ($n = 26$)	Incomplete steps ($n = 8$)	
Age	43 ± 15.8	52.6 ± 18.5	$P = 0.16$
Gender			$P = 0.23$
Male	9 (35%)	5 (62.5%)	
Female	17 (65%)	3 (37.5%)	
Educational level			$P = 0.079$
Below high school degree	8 (31%)	0 (0%)	
High school degree	12 (46%)	3 (38%)	
Secondary education	6 (23%)	5 (63%)	
Type of surgery			$P = 0.69$
Cholecystectomy	16 (62%)	4 (50%)	
Appendicectomy	10 (38%)	4 (50%)	

Table III. *Acceptability rate per demographic category ($n = 34$)*

Demographics	Total number	Acceptability rate	
Gender			$P = 0.84$
Male	14	9 (64.3%)	
Female	20	17 (85%)	
Educational level			$P = 0.8133$
Below high school degree	8	8 (100%)	
High school degree	15	12 (80%)	
Secondary education	11	6 (54.5%)	
Type of surgery			$P = 0.71$
Cholecystectomy	20	16 (80%)	
Appendicectomy	14	10 (71.4%)	

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clinical patient care procedures were declared. The only noteworthy difficulty acknowledged by the local professionals was internet access. This corroborates with one patient's comment, where a relevant connectivity issue which imposed difficulties to watch the guide was expressed.

Discussion

Patient education for surgical patients has long been a topic of debate. Evidences that preoperative education reduces stress levels, pain and anxiety date back to 1970s [27]. A Cochrane systematic review on patient education for cholecystectomy patients argued that due to the low quality of evidence, they could not determine whether formal preoperative education provides any benefit to patients [28]. Most institutions and governments have limited their span of action to offering informative leaflets, which lack support from the literature regarding their efficacy and are often difficult to read [25]. A randomized trial comparing different methods of preoperative education showed that multimedia usage resulted in higher patient knowledge recall when compared with pamphlets or verbal instructions, as well as higher satisfaction rates [29]. The use of internet-based tools in healthcare is exponentially growing, and there is an expectation that it will play an important role in service delivery. However, this transition is not straightforward, as many issues including acceptability and accessibility to digital media and internet must be addressed.

A study done with patients undergoing hernioplasty or cholecystectomy showed that only 31% of patients with internet access spontaneously used online resources to obtain information about their procedure [30]. Another corroborative study demonstrated that the internet was infrequently used as a source of information for patients undergoing cholecystectomy [31]. However, these studies are over 10 years old, and the advancement of the digital era has since been undeniable, expanding internet access to households anywhere in the world.

Although internet is widely diffused around the world, we still see varied degrees of connectivity for healthcare use, especially in LMICs [32]. Many health workers and patients experience logistical challenges when using digital health technologies [14]. Nonetheless, the extent to which online media has quickly spread to other parts of daily lives is an empirical demonstration that the future of healthcare is inevitably to become progressively more digital. A recent randomized trial using a web-based education platform for preoperative orthopedic patients suggested that this approach resulted in improved preparedness for surgery and rehabilitation and encouraged patients to participate actively in their treatment with more knowledge (33). Additionally, a study by Koenig *et al*. assessed patient use of internet-based resources for sports medicine and revealed that 54% of patients used the internet for find information about their condition, but most were either neutral or distrusted the available online information [34]. Contradictory information coming from an array of sources with no coordination may create uncertainty and even worsen anxiety [13]. Patients do not know how to identify reliable and evidence-based information on the internet due to the abundance of sources [10]. A centralization of content by governments' healthcare institutions and/or associations may be required to organize the available content.

This research assessed the feasibility of applying a centralized patient education tool in a low-resource setting. The results of the feasibility analysis identified an acceptability rate of 76.5%, which constitutes a strong indication of the feasibility of this intervention. It is noteworthy, however, that no home access was identified. This may indicate either a problem in the application of the tool or a general lack of interest in postoperative phases. The implementation phase of the study took place in a single moment, and there were no reminders for patients that the videos were available in the postoperative stages. This study also identified relevant differences in the participants' demographic characteristics that may have had an effect on their acceptability. Although no statistically significant differences were identified, this was most likely

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due to the sample size and study power. Confirming this idea, a randomized trial assessing the use of a multimedia tool in the consent process for elective surgical patients identified that race, education and age were independent predictors of patient comprehension [35].

This study reported a lower acceptability of the tool for patients with higher educational levels. Participants with an educational level lower than a high school degree had 100% acceptability rates, while participants with a high school degree had an acceptability rate of 80% and that the rate was only 54.5% for those with secondary-level education. Possibly, those with higher educational levels may assume to possess more knowledge and more autonomy to reach additional information. Age and gender were also identified as varying factors in the acceptability groups. A small age difference of approximately 9 years was identified between the groups, which may indicate that younger people accept educational tools with superior ease. Likewise, women had an acceptability rate of 85% and were more likely to complete the entirety of this tool, while men had 64.3% acceptability rates. Studies have shown that patients with lower educational levels may gain most when multimedia tools are used for preoperative education [36–39], as well as younger patients [40, 41]. Contrarily, no studies showing a gender effect on the acceptability were identified, which has been a random finding in this study.

Considering the analysis from the data collected in this study and the review of evidence in the literature, it is possible to conclude that it is feasible to conduct digital health education interventions in LMICs. Through this research, some clear methodological elements in the development of a new platform to address this issue in LMICs were observed. As a result, this study constructed a protocol proposal to provide future educational interventions with a framework to achieve feasibility and sustainability with specific actions to be adopted. An eight-step procedure is outlined as a protocol for the development of feasible digital patient education interventions in LMICs:

(i) Establishment of the content demanded based on health needs.
(ii) Definition of the target population (age, gender and socioeconomic status).
(iii) Development of content with partnerships, considering a Patient Education Triad:
  (a) Evidence-based medical information.
  (b) Didactically engaging multimedia product.
  (c) Locally appropriate content (linguistically and culturally).
(iv) Creation of a user-friendly online platform.
(v) Implementation of intervention tool.
(vi) Generation of assessment tools for results analysis.
(vii) Collection of feedback and suggestions.
(viii) Elaboration of long-term sustainability project to maintain the usage of platform.

The implementation of a free, web-based, multimedia platform to deliver patient education has great sustainability prospects. The development of innovative digital health technologies may be done in a centralized fashion, which may incur in an initial expenditure, but results in a globally available tool with low maintenance cost. This model can guarantee long-term economic sustainability for local institutions. Some positive financial consequences to healthcare systems may be observed, such as the reduction of healthcare costs with analgesia and a decrease in hospital visits. Additionally, patients may see a reduction in the burden of travel to healthcare institutions and easier return to work activities [14]. Lastly, adequate preoperative informational sessions have been shown to be more effective when they last longer [35]. By offering digital tools for patient education, it may be possible to reduce the time spent by healthcare professionals during preoperative sessions, thereby reducing workload and increasing work efficiency [37]. However, future studies should explore this matter to determine strong evidence that may support these possibilities.

This literature review identified 23 randomized trials on the use of any multimedia tool in any

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surgical scenario [2, 7, 15, 17–19, 21, 29, 36–39, 42–51]. A systematic review assessing the use of portable electronic devices for health education in low-resource settings identified only 10 studies related to the topic, but none were for surgical patients [52]. The present study is unique since it assesses the use of animations as an innovative multimedia educational tool for urgent surgical patients in a low-resource setting. However, this study presented limitations, the main on being its limited sample size, which restricted its power. This was a study design decision since the objective was to assess the feasibility of introducing a specific tool in a particular scenario. Consequently, the study was not able to demonstrate statistical significance with inference tests to corroborate the analysis. This lack of significance due to the small sample size does not exclude the clear discrepancies identified between the groups of acceptability, but it hinders any definitive conclusion. Furthermore, this study was not designed as a randomized, controlled trial, which may have produced research biases.

Conclusion

This study aimed to assess the application of a tool to overcome the existing gap in the communication between healthcare professionals and patients by creating multimedia animations as preoperative patient guides. Presently, new web-based platforms can readily be available universally and offer the possibility to standardize content and eliminate misinformation, while providing locally appropriate content through global collaborations. The study confirms the feasibility to introduce this type of digital resource as a patient education tool for urgent surgical patients in a low-resource setting. LMICs may benefit the most with digital multimedia interventions for healthcare due to their higher rates of inadequate patient education and lower availability of resources. This tool can be offered virtually, allowing it to be sustainable for a more extended period while creating the foundations of a modern patient education culture. Potential improvement of surgical outcomes should be studied in future research to establish the clinical benefits of such interventions.

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Authors' contribution

G.S. contributed to the literature review, the design and implementation of the research, the analysis and the writing of the manuscript.
D.G. contributed to the design and implementation of the research, the analysis and the writing of the manuscript.
D.D., as the research supervisor, contributed to the literature review, the implementation of the research, the data analysis and the writing of the manuscript.
E.M.U., as the local research supervisor, contributed to the implementation of the research, the data analysis and the writing of the manuscript.

Conflict of interest statement

None declared.

Ethics approvals

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

The study was approved on 3 July 2019 by the local Ethics in Research Committee of the Hospital das Clínicas, Universidade de São Paulo, São Paulo (SP), Brazil (protocol number 3.435.142).

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This study was also approved on 8 May 2019 by the Institutional Review Board at the Faculty of Medicine of McGill University, Montreal (QC), Canada (study number A05-E35-19A).

References

1. Rodin G, Mackay JA, Zimmermann C *et al.* Clinician-patient communication: a systematic review. *Support Care Cancer* 2009; **17**: 627–44.
2. Dallimore R-K, Asinas-Tan ML, Chan D *et al.* A randomised, double-blinded clinical study on the efficacy of multimedia presentation using an iPad for patient education of postoperative hip surgery patients in a public hospital in Singapore. *Singapore Med J* 2017; **58**: 562–8.
3. Manning DL, Dickens C. Health literacy: more choice, but do cancer patients have the skills to decide? *Eur J Cancer Care (Engl)* 2006; **15**: 448–52.
4. Nurhayati N, Songwathana P, Vachprasit R. Surgical patients' experiences of readiness for hospital discharge and perceived quality of discharge teaching in acute care hospitals. *J Clin Nurs* 2019; **28**: 1728–36.
5. Brock TP, Smith SR. Using digital videos displayed on personal digital assistants (PDAs) to enhance patient education in clinical settings. *Int J Med Inf* 2007; **76**: 829–35.
6. Klein-Fedyshin M, Burda ML, Epstein BA *et al.* Collaborating to enhance patient education and recovery. *J Med Libr Assoc JMLA* 2005; **93**: 440–5.
7. Jlala HA, French JL, Foxall GL *et al.* Effect of preoperative multimedia information on perioperative anxiety in patients undergoing procedures under regional anaesthesia. *Br J Anaesth* 2010; **104**: 369–74.
8. Lemaire J Scaling up mobile health: elements necessary for the successful scale up of mHealth in developing countries. 2011.
9. Lewis T, Synowiec C, Lagomarsino G *et al.* E-health in low- and middle-income countries: findings from the Center for Health Market Innovations. *Bull World Health Organ* 2012; **90**: 332–40.
10. Eggers C, Obliers R, Koerfer A *et al.* A multimedia tool for the informed consent of patients prior to gastric banding. *Obes Silver Spring Md* 2007; **15**: 2866–73.
11. World Health Organization. Global strategy on digital health 2020–2024. 2020.
12. Kessels RPC. Patients' memory for medical information. *J R Soc Med* 2003; **96**: 219–22.
13. Gysels M, Higginson IJ. Interactive technologies and videotapes for patient education in cancer care: systematic review and meta-analysis of randomised trials. *Support Care Cancer* 2007; **15**: 7–20.
14. WHO guideline Recommendations on Digital Interventions for Health System Strengthening. Geneva: World Health Organization; 2019.
15. Lo S-F, Wang Y-T, Wu L-Y *et al.* Multimedia education programme for patients with a stoma: effectiveness evaluation. *J Adv Nurs* 2011; **67**: 68–76.
16. Kamat N, Rajan Mallayasamy S, Sharma P *et al.* Effect of video-assisted patient education on compliance with therapy, quality of life, psychomorbidity, and cost of illness in irritable bowel syndrome. *Postgrad Med* 2019; **131**: 60–7.
17. Sun V, Raz DJ, Ruel N *et al.* A multimedia self-management intervention to prepare cancer patients and family caregivers for lung surgery and postoperative recovery. *Clin Lung Cancer* 2017; **18**: e151–9.
18. Tou S, Tou W, Mah D *et al.* Effect of preoperative two-dimensional animation information on perioperative anxiety and knowledge retention in patients undergoing bowel surgery: a randomized pilot study. *Colorectal Dis* 2013; **15**: e256–65.
19. Doering S, Katzlberger F, Rumpold G *et al.* Videotape preparation of patients before hip replacement surgery reduces stress. *Psychosom Med* 2000; **62**: 365–73.
20. Demir F, Ozsaker E, Ilce AO. The quality and suitability of written educational materials for patients: quality and suitability of educational materials. *J Clin Nurs* 2007; **17**: 259–65.
21. Sørlie T, Busund R, Sexton J *et al.* Video information combined with individualized information sessions: effects upon emotional well-being following coronary artery bypass surgery—A randomized trial. *Patient Educ Couns* 2007; **65**: 180–8.
22. Ayyadhah Alanazi A. Reducing anxiety in preoperative patients: a systematic review. *Br J Nurs Mark Allen Publ* 2014; **23**: 387–93.
23. Garretson S. Benefits of pre-operative information programmes. *Nurs Stand* 2004; **18**: 33–7.
24. Sameen Z, Talib K, Wani SQ *et al.* Preoperative education improves the preparedness for extubation at emergence from general anaesthesia! *J Perioper Pract* 2022; **32**: 41–6.
25. Mulsow JJW, Feeley TM, Tierney S. Beyond consent—improving understanding in surgical patients. *Am J Surg* 2012; **203**: 112–20.
26. Lancaster GA, Dodd S, Williamson PR. Design and analysis of pilot studies: recommendations for good practice: design and analysis of pilot studies. *J Eval Clin Pract* 2004; **10**: 307–12.
27. Shuldham C. 1. A review of the impact of pre-operative education on recovery from surgery. *Int J Nurs Stud* 1999; **36**: 171–7.
28. Gurusamy KS, Vaughan J, Davidson BR. Formal education of patients about to undergo laparoscopic cholecystectomy. *Cochrane Database Syst Rev* 2014; **2014**: CD009933.
29. Cornoiu A, Beischer AD, Donnan L *et al.* Multimedia patient education to assist the informed consent process for knee arthroscopy: multimedia patient education for surgery. *ANZ J Surg* 2011; **81**: 176–80.
30. Tamhankar A, Mazari F, Everitt N *et al.* Use of the internet by patients undergoing elective hernia repair or cholecystectomy. *Ann R Coll Surg Engl* 2009; **91**: 460–3.
31. Blay N, Donoghue J. Source and content of health information for patients undergoing laparoscopic cholecystectomy. *Int J Nurs Pract* 2006; **12**: 64–70.
32. Mishra SR, Lygidakis C, Neupane D *et al.* Combating non-communicable diseases: potentials and challenges for community health workers in a digital age, a narrative review of the literature. *Health Policy Plan* 2019; **34**: 55–66.

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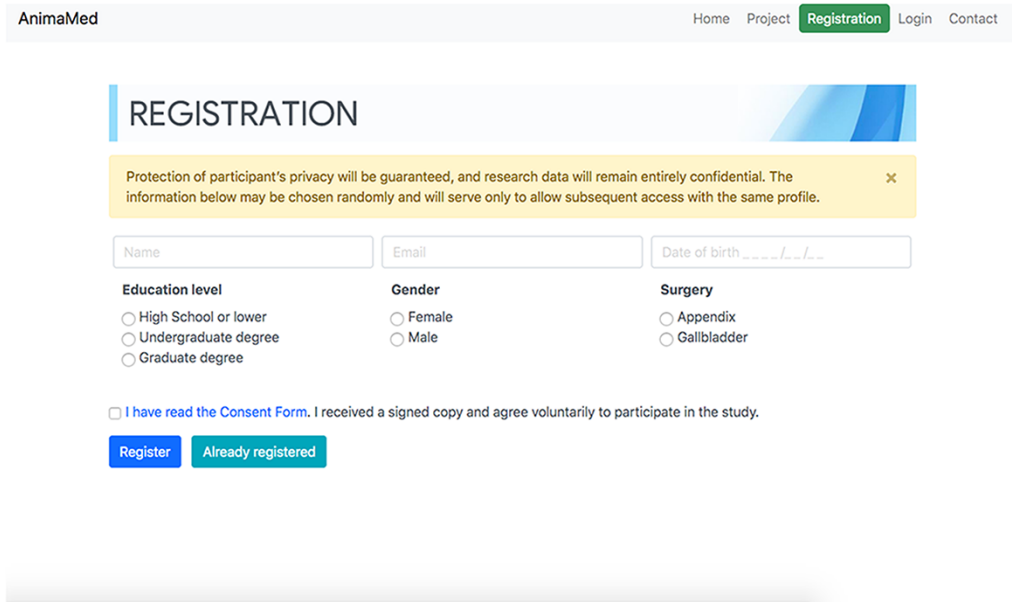
33. Yin B, Goldsmith L, Gambardella R. Web-based education prior to knee arthroscopy enhances informed consent and patient knowledge recall: a prospective, randomized controlled study. *J Bone Jt Surg* 2015; **97**: 964–71.
34. Koenig S, Nadarajah V, Smuda MP *et al.* Patients' use and perception of internet-based orthopaedic sports medicine resources. *Orthop J Sports Med* 2018; **6**: 232596711879646.
35. Fink AS, Prochazka AV, Henderson WG *et al.* Predictors of comprehension during surgical informed consent. *J Am Coll Surg* 2010; **210**: 919–26.
36. Bollschweiler E, Apitsch J, Obliers R *et al.* Improving informed consent of surgical patients using a multimedia-based program?: Results of a prospective randomized multicenter study of patients before cholecystectomy. *Ann Surg* 2008; **248**: 205–11.
37. Wilhelm D, Gillen S, Wirnhier H *et al.* Extended preoperative patient education using a multimedia DVD—impact on patients receiving a laparoscopic cholecystectomy: a randomised controlled trial. *Langenbecks Arch Surg* 2009; **394**: 227–33.
38. Rossi MJ, Guttmann D, MacLennan MJ *et al.* Video informed consent improves knee arthroscopy patient comprehension. *Arthrosc J Arthrosc Relat Surg* 2005; **21**: 739–43.
39. Rossi M, McClellan R, Chou L *et al.* Informed consent for ankle fracture surgery: patient comprehension of verbal and videotaped information. *Foot Ankle Int* 2004; **25**: 756–62.
40. Tuveri M, Caocci G, Efficace F *et al.* Different perception of surgical risks between physicians and patients undergoing laparoscopic cholecystectomy. *Surg Laparosc Endosc Percutan Tech* 2009; **19**: 305–11.
41. Taylor RJ, Chiu AG, Palmer JN *et al.* Informed consent in sinus surgery: link between demographics and patient desires. *The Laryngoscope* 2005; **115**: 826–31.
42. Eggers C, Obliers R, Koerfer A *et al.* A multimedia tool for the informed consent of patients prior to gastric banding. *Obesity* 2007; **15**: 2866–73.
43. Blay N. The effect of pre-admission education on domiciliary recovery following laparoscopic cholecystectomy. *Aust J Adv Nurs* 2005; **22**: 7.
44. Huber J, Ihrig A, Yass M *et al.* Multimedia support for improving preoperative patient education: a randomized controlled trial using the example of radical prostatectomy. *Ann Surg Oncol* 2013; **20**: 15–23.
45. Hoppe DJ, Denkers M, Hoppe FM *et al.* The use of video before arthroscopic shoulder surgery to enhance patient recall and satisfaction: a randomized-controlled study. *J Shoulder Elbow Surg* 2014; **23**: e134–9.
46. Luck A, Pearson S, Maddem G *et al.* Effects of video information on precolonoscopy anxiety and knowledge: a randomised trial. *The Lancet* 1999; **354**: 2032–5.
47. Danino AM, Chahraoui K, Frachebois L *et al.* Effects of an informational CD-ROM on anxiety and knowledge before aesthetic surgery: a randomised trial. *Br J Plast Surg* 2005; **58**: 379–83.
48. Keulers BJ, Welters CFM, Spauwen PHM *et al.* Can face-to-face patient education be replaced by computer-based patient education? A randomised trial. *Patient Educ Couns* 2007; **67**: 176–82.
49. Clark S, Mangram A, Ernest D *et al.* The informed consent: a study of the efficacy of informed consents and the associated role of language barriers. *J Surg Educ* 2011; **68**: 143–7.
50. Fink AS, Prochazka AV, Henderson WG *et al.* Enhancement of surgical informed consent by addition of repeat back. *Ann Surg* 2010; **252**: 10.
51. Bondy L. The effect of anesthetic patient education on preoperative patient anxiety. *Reg Anesth Pain Med* 1999; **24**: 158–64.
52. McHenry MS, Fischer LJ, Chun Y *et al.* A systematic review of portable electronic technology for health education in resource-limited settings. *Glob Health Promot* 2019; **26**: 70–81.

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Appendix

Appendix A1. Images of the online platform

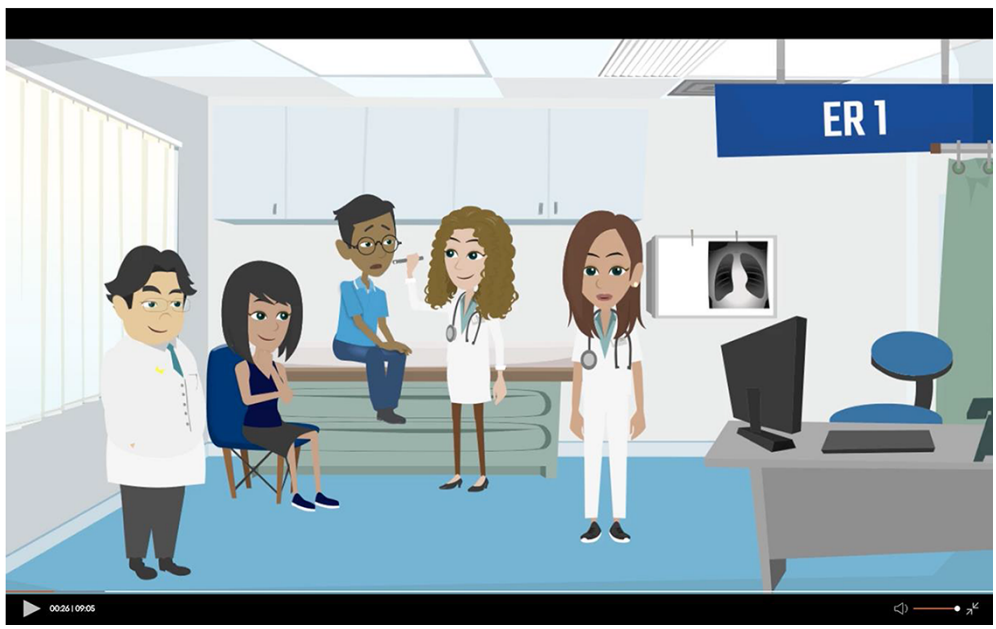




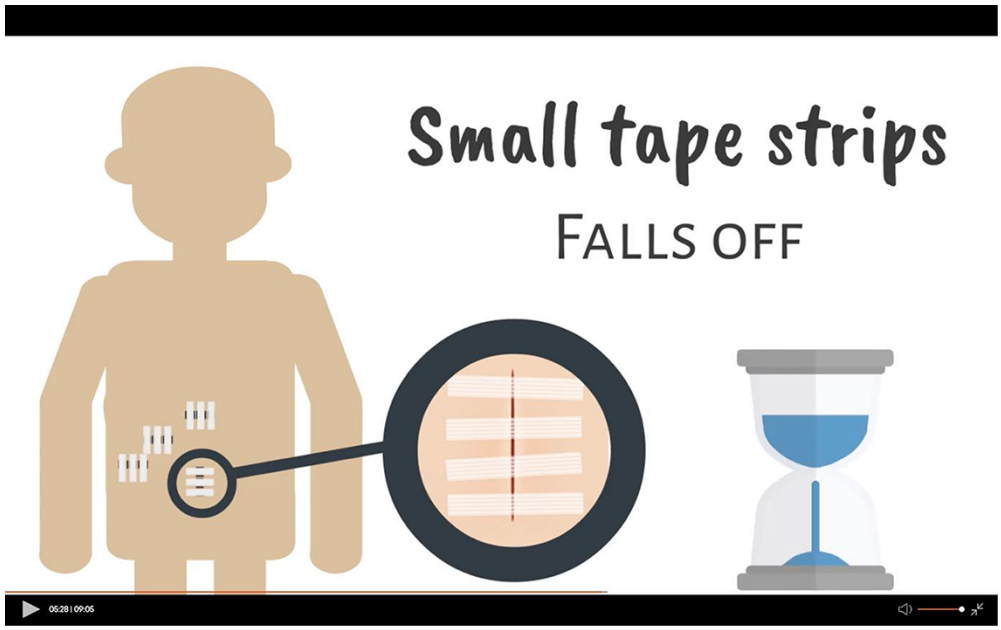
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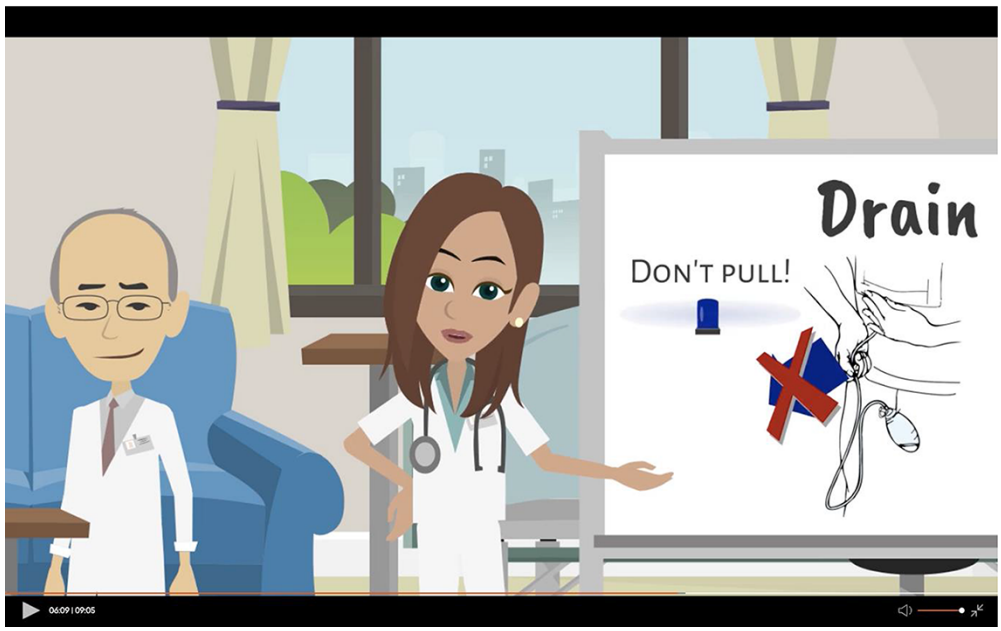
Appendix A2. Still images of animations





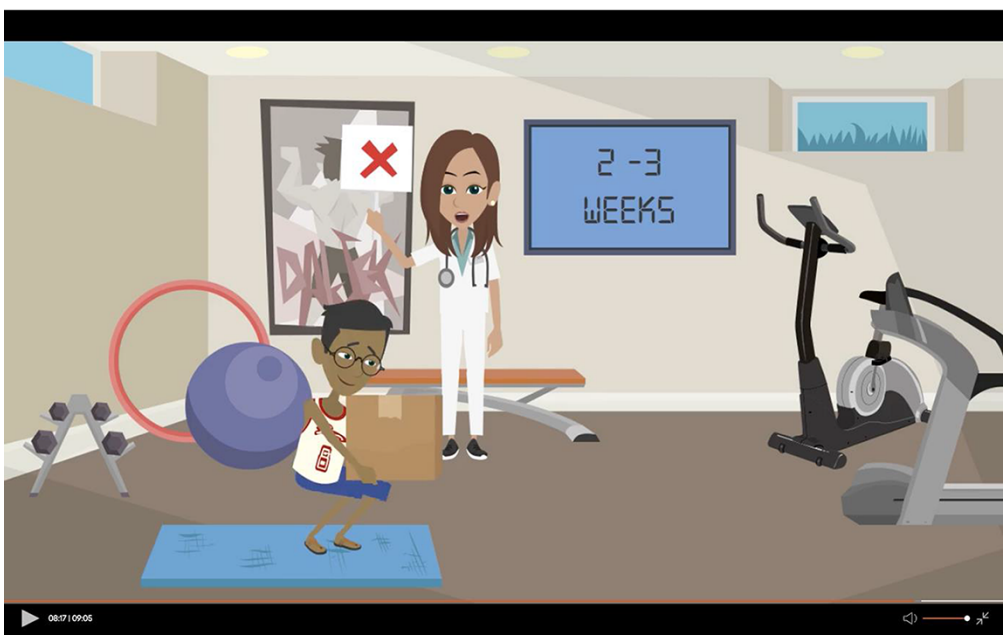
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Appendix A3. Animation manuscript

Introduction

Hello there! Our hospital team recently diagnosed you with a problem in your gall bladder. Our hospital team recently diagnosed you with a problem in your appendix. We are here to help your through this situation by providing you with some practical information to help you along your surgical procedure. It is completely normal to feel nervous right now, to have doubts and many questions. But together we will explore how to prepare, what to expect and the best way to be involved in your recovery after your surgery.

All information presented here is recommended by a critical review of the medical literature and supported by your team of surgeons. Surgery guides like these have been shown to reduce fear, fatigue and pain while speeding up the recovery process. Planning for your procedure and going in as healthy as you can will have a positive influence on your recovery.

Preoperative

Your surgery will start soon enough, with no rush. Until then, there are some things that you have to do:

1. To have the operation you must have spent at least 8 h without eating any food and 4–6 h without drinking water. If your doctor has not allowed you to eat, you should follow that order until further notice. Sometimes if your surgery is only going to happen another day, the doctor can give you food, but remember to only eat when he tells you that you can.
2. Until your surgery, you are allowed to walk freely if you want and are able to without causing more pain.
3. You can take a shower or bathe your full body with soap but avoid washing your hair. Doing this will lower your risk of surgical site infection. Also ask for someone to help you remove your nail polish from your hands and feet.
4. Do not shave the area where you will be operated on. If needed, this will be done for you by the nurse or in the operating room.
5. Give all your jewelry and accessories to a family member. When it is close to your surgery, you will be asked to remove your clothes and put the hospital gown.
6. You are probably already receiving antibiotics and some medications to improve your pain and nausea. If you are still feeling anything, let the nurse know so she can help you feel better.

You can relax now and wait for them to call you to surgery. Let us continue with this guide to talk about your procedure.

Intraoperative

To make you feel better, the best solution for your situation is to have surgery. When there is a problem with the gallbladder, the procedure to solve that is called cholecystectomy, which is just a technical word to say: removal of the gallbladder. When there is a problem with the appendix, the procedure to solve that is called appendectomy, which is just a technical word to say: removal of the appendix. Do not worry because your body will not miss it!

This surgery is always done with general anesthesia. This surgery is usually done with general anesthesia. This way, you will be sleeping the whole time and feel no pain or remember anything after the anesthesiologist gives you all of the medications.

Most of the time, this procedure will be done using a video camera that goes inside your belly through a small cut in your belly button. The surgeon will also make two or three additional small cuts under your ribs in order to do the surgery. Sometimes it is necessary to do the surgery with a bigger cut under your ribs on the right side. The surgeon will also make two or three additional small cuts on the lower part of your belly. Sometimes it is necessary to do the surgery with a bigger cut in the middle of your belly or on the lower part of it. This is all done to ensure the safest and best quality treatment for you.

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If the surgeon finds that there is an important infection in the area, it may be necessary to put in a drain. That means you will wake up with a piece of plastic coming out from one of the cuts. But do not worry because this is not bad for you and does not hurt! The surgeon will remove it as soon as possible.

This surgery usually takes 1–3 h but remember that the preparation also takes some time, so tell your relatives to stay calm because the surgeon will talk to them as soon as it is over.

Do you have any questions about the surgery? You can still ask your doctors there. If not, then you are ready to hear about how it will be after surgery.

Postoperative

When you wake up after surgery, you may feel cold, weak, tired, nauseated and experience pain in your belly or in your shoulder. If you are having pain or nausea, tell your nurse, who will help you get more comfortable and give you medication.

Your throat may feel sore from the tube used to help you breathe during surgery. Feeling stiff or achy is also normal at this time. These feelings will go away when you start to move around more.

After you are fully awake, if your surgeon has allowed it, you can drink something and when it is mealtime the hospital will also bring you food. But do not wait for all that to sit up or get out of bed. The sooner you move, the better your recovery. Just remember to ask for help the first time out of bed, since you may feel a little dizzy. This will pass after your body readjusts.

You will have bandages where the cuts are. Do not remove them before 24 h. If they happen to fall out or get wet, exchange them for a similar bandage. After 2 days, you can leave the cuts without any protection. If they are not yet dry, you can use bandages to protect your clothes. You can then wash them normally in the bath. Just remember to leave them dry after the shower. If you see small tape strips over the cuts, you can just wait for them to fall off after a few showers. If you see stitches or clips, leave them there until a healthcare professional removes them after about 10 days. If you do not see any stitches there, then great! You do not have to worry about anything.

If you feel numb or sensitive around the area of the cuts, that is normal. You may also see some bruising on the skin and some swelling as well. This will all disappear with time.

If you have a drain, the nurse will empty it while you are at the hospital. Take that time to learn how you can do it at home. You do not have to be scared about it, just be careful not to pull it too hard.

At Home

After you leave the hospital, you will still have to take some time off to recover from the surgery. You will go back to feeling well after a few days, but it usually takes about a week for you to start feeling normal again. Take the time to catch up on some personal hobbies and rest!

It is normal to have some pain during the first weeks following surgery. You should have pain and nausea medications prescribed for home. You can take them for as long as the doctor prescribed. If you not feeling anything without them, you can stop taking them. Sometimes you may also need to take antibiotics at home. These have to follow strict schedule, so do not forget about them. You can also go back to taking your usual medications before the surgery, unless your doctor specifically told you not to.

If you have a drain, make sure you or a relative knows how to empty it and care for it at home. It is important to write down how much fluid is coming out of the drain each day and bring it to your follow-up appointment.

Sometimes the cuts can get infected. If they appear red, painful or start to leak fluid, please contact a healthcare professional. You should also seek professional help if you feel severe pain in the belly or chest, fever (38.5^{o}C or above), shortness of breath or constant vomiting.

There are no special restrictions to your diet, but a balanced, varied diet is always a good way to go.

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If you were on a special diet before your surgery, such as for diabetes or high blood pressure, start back on it.

Sometimes it is normal to have constipation after the surgery. To avoid that, remember to drink lots of fluid and eat fiber-rich foods like fruits and vegetables.

It is best to avoid pressing or stretching your belly. That means you should not lift anything heavy for at least 2–3 weeks after the surgery. For example, you should not carry babies or heavy boxes around.

You can drive when you feel comfortable sitting and alert enough to pay attention to the road.

You can also resume sexual activity normally as you feel gradually better.

You can try to increase your activities everyday according the progress you feel. You can go for walks, go out with friends and celebrate with family.

Conclusion

Remember to schedule a follow-up appointment. Each day, you should feel some improvement but do ask your healthcare provider if you are worried about something.

It is our hope that this video makes you feel more confident about what is ahead. We wish you the best on your journey.

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Appendix A4. Certificates of ethics board approvals



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Tél/Tel: (514) 398-3124

CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

The Faculty of Medicine Institutional Review Board (IRB) is a registered University IRB working under the published guidelines of the Tri-Council Policy Statement, in compliance with the Plan d'action ministériel en éthique de la recherche et en intégrité scientifique (MSSS, 1998), and the Food and Drugs Act (17 June 2001); and acts in accordance with the U.S. Code of Federal Regulations that govern research on human subjects. The IRB working procedures are consistent with internationally accepted principles of Good Clinical Practices.

At a full Board meeting on 13 May 2019, the Faculty of Medicine Institutional Review Board, consisting of:

Frances Aboud, PhD	Alain Brunet, PhD
Joséane Chrétien, MJur	Patricia Dobkin, PhD
Carolyn Ells, PhD	Anthanasios Katsarkas, MD
Catherine Lecompte	Sally Mann, M.S.
Kathleen Montpetit, M.Sc.	Roberta Palmour, PhD
Lucille Panet-Raymond, BA	Maida Sewitch, PhD

Margaret Swaine, BA

Examined the research project **A05-E35-19A** titled: *Feasibility of the application of multimedia animations as preoperative guides for urgent abdominal surgeries in public hospitals in Brazil*

As proposed by: Dr. Dan Deckelbaum (Applicant) to _____ (Granting Agency, if any)

And consider the experimental procedures to be acceptable on ethical grounds for research involving human subjects.

13 May 2019 (Date)

Roberta Palmour (Chair, IRB) _____ (Dean/Associate Dean)

Institutional Review Board Assurance Number: FWA 00004545

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PARECER CONSUBSTANCIADO DO CEP

DADOS DO PROJETO DE PESQUISA

Título da Pesquisa: Viabilidade da aplicação de animações multimídia como guias pré-operatórios para cirurgias abdominais de urgência em hospitais públicos no Brasil

Pesquisador: Edivaldo Massazo Utiyama

Área Temática:

Versão: 1

CAAE: 14123419.2.0000.0068

Instituição Proponente: Hospital das Clínicas da Faculdade de Medicina da USP

Patrocinador Principal: Financiamento Próprio

DADOS DO PARECER

Número do Parecer: 3.435.142

Apresentação do Projeto:

Comunicação efetiva com paciente é um desafio e obstáculos como grau de instrução, cultura e linguagem desempenham papel vital na compreensão do paciente sobre sua saúde e podem influenciar resultados de tratamento. Ferramentas para ajudar profissionais de saúde apresentam limitações, particularmente para pacientes com barreiras a métodos tradicionais de ensino, como para aqueles com baixos níveis de alfabetização em países de baixa e média renda (PBMRs). Educação pré-operatória ajuda pacientes a sentir menos ansiedade, ter papel ativo no processo de tomada de decisões e aumentar a autoeficácia, além de diminuir tempo de hospitalização e da demanda de analgesia pós-operatória. Atualmente, não está claro quais os métodos mais eficazes ou quando é o momento ideal para oferecer informações cirúrgicas. Juntamente com essa incerteza, novas tecnologias são frequentemente descartadas devido a recursos limitados. Isto é ainda mais difícil em PBMRs, onde inadequados grau de instrução dos pacientes são mais elevados e recursos hospitalares são mais baixos. Estudos investigaram diversos aspectos do uso de recursos multimídia para fins clínicos, entretanto poucos analisaram a aplicação em pré-operatório e nenhum avaliou o uso destas ferramentas em populações de PBMRs ou para de cirurgias de urgências. Ferramentas multimídia para educação de pacientes é eficaz em todas as idades e o uso de recursos audiovisuais pode melhorar o aprendizado e otimizar resultados clínicos.

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Objetivo da Pesquisa:

Avaliar a viabilidade da aplicação de animações como guias pré-operatória para pacientes submetidos a procedimentos cirúrgicos de urgência em hospitais públicos em um país de renda média.

Avaliação dos Riscos e Benefícios:

Riscos: Os participantes do estudo não sofrerão danos de qualquer natureza e o respeito por sua dignidade será priorizado durante todo o período do estudo. A proteção da privacidade do participante será garantida e os dados da pesquisa permanecerão totalmente confidenciais, garantidos por um banco de dados online protegidos por senha acessados exclusivamente pelo investigador principal. O anonimato dos participantes será protegido pelo processo de coleta de dados e assegurado pelo investigador principal, impedindo que os pesquisadores tenham acesso a informações de identificação ou histórico hospitalar do participante.

Benefícios: Este estudo visa preencher a lacuna existente na comunicação entre profissionais de saúde e pacientes, criando animações multimídia como guias para pacientes pré-operatórios. Com essas animações multimídia, os pacientes poderão entender melhor sua condição médica, participar do processo de tomada de decisão em conjunto com os profissionais de saúde e ampliar a base de conhecimento sobre o que esperar do seu procedimento cirúrgico.

Comentários e Considerações sobre a Pesquisa:

Este projeto será submetido aos Conselhos de Ética em Pesquisa (CEP) no Canadá e no Brasil, tendo em vista que se trata de um estudo com colaboração entre universidades de ambos os países.

Considerações sobre os Termos de apresentação obrigatória:

Estão adequados. Esta será uma pesquisa em colaboração entre o Brasil e o Canadá, tendo apresentado a aprovação da instituição canadense.

Conclusões ou Pendências e Lista de Inadequações:

Adequado.

Considerações Finais a critério do CEP:

Em conformidade com a Resolução CNS nº 466/12 – cabe ao pesquisador: a) desenvolver o projeto conforme delineado; b) elaborar e apresentar relatórios parciais e final; c)apresentar dados solicitados pelo CEP, a qualquer momento; d) manter em arquivo sob sua guarda, por 5 anos da pesquisa, contendo fichas individuais e todos os demais documentos recomendados pelo CEP; e)

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encaminhar os resultados para publicação, com os devidos créditos aos pesquisadores associados e ao pessoal técnico participante do projeto; f) justificar perante ao CEP interrupção do projeto ou a não publicação dos resultados.

Este parecer foi elaborado baseado nos documentos abaixo relacionados:

Tipo Documento	Arquivo	Postagem	Autor	Situação
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_DO_PROJETO_1341180.pdf	20/05/2019 11:30:58		Aceito
Outros	AprovMcGill.pdf	20/05/2019 11:30:11	Edivaldo Massazo Utiyama	Aceito
Folha de Rosto	FRosto9691.pdf	20/05/2019 11:25:28	Edivaldo Massazo Utiyama	Aceito
Outros	SGP.pdf	14/05/2019 08:16:04	Edivaldo Massazo Utiyama	Aceito
Outros	CartaCompromisso.pdf	14/05/2019 08:11:26	Edivaldo Massazo Utiyama	Aceito
Outros	AnuenciaMcGill.pdf	14/05/2019 08:10:07	Edivaldo Massazo Utiyama	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	TCLE.pdf	14/05/2019 08:07:44	Edivaldo Massazo Utiyama	Aceito
Outros	anexos.pdf	14/05/2019 08:06:51	Edivaldo Massazo Utiyama	Aceito
Orçamento	financiamento.pdf	14/05/2019 08:05:42	Edivaldo Massazo Utiyama	Aceito
Cronograma	cronograma.pdf	14/05/2019 08:04:26	Edivaldo Massazo Utiyama	Aceito
Projeto Detalhado / Brochura Investigador	projpesq2019.pdf	14/05/2019 08:00:56	Edivaldo Massazo Utiyama	Aceito

Situação do Parecer:
Aprovado

Necessita Apreciação da CONEP:
Não

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Continuação do Parecer: 3.435.142

SAO PAULO, 03 de Julho de 2019

Assinado por:
ALFREDO JOSE MANSUR
(Coordenador(a))

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