



## **Elective Surgery Cancellation in A Hospital Setting: A Review**

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### **ABSTRACT**

Encouragement of cost-effectiveness in patient care is necessary due to the rising cost of healthcare and the depletion of financial resources. Case cancellations on the day of surgery results in inefficient use of operating rooms, waste of precious staff, and a reduction in resources available to patients and hospitals. Financial troubles and psychological stress are possible for patients. Hospitals could miss out on chances to do surgery, waste disposable equipment that was opened for cases that were never handled, and spend money on paying wages and benefits to employees who aren't working. In order to prevent needless case cancellations, the medical community must promote cost-effectiveness in all facets of patient care without compromising the standard of care that a doctor provides.

**Key words:** Elective surgeries; Cancellation; Causes of cancellation

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### **INTRODUCTION**

Surgical cancellation is an indicator in assessing the quality of care provided by the hospital services to its patient [Pattnaik,2022]. Operating rooms are among the most critical and important wings of the hospital, contributing to the workload, resources utilization and also revenue [Dexter,et al,2002]. Efficient use of OR time depends on scheduling of cases, allocation of staff, equipment and other resources. Its goal is to encourage cost effectiveness to minimize cost of treatment in every aspect of patient care, thus careful planning and bearing in mind the constraints in human and material resources should be made to prevent cancellation of elective surgery [Chalya, 2011].

According to Dr. Alejandro Sanz, Elective surgeries are important procedures that can be scheduled in advance; Elective surgeries are different from an urgent or emergency surgery, where the patient has an immediate, possibly life-threatening issue which requires medical attention.

Different definitions of cancellation exist in the international literature. Some authors define “cancellation” as on those procedures that were cancelled on the day on which surgery was scheduled [Haile,et al,2015], whereas others also include those that were cancelled on the previous day [Chalya,2011, Rai, 2003,]. The Modernization Agency Theatre Programme (NHS, UK) appears to define cancellation as those that occur after the patient has been notified of operation. [Henderson,] Cancellations of elective surgery are a well-documented occurrence in a medical institution. The procedures are proposed ahead of time and recorded accordingly; even concerned parties are informed such as anesthesiologists and other specialties depending on the specific medical needs of the surgical patients.

In an era of decreasing payments for surgical and anesthesia services, minimizing inefficiency is vital. Cancellations of surgeries have a psychological impact on the patient. [Perroca, 2007] A long waiting time for elective surgery due to cancellations may put stress on the patient and the patient's relatives. This makes the patient continue living with anxiety on top of the discomfort of his physical disability.

While discussing the topic, the major health pandemic should be taken into consideration. COVID 19 which has had a devastating effect on the health and life of people has significantly contributed to the cancellation of elective procedures. [Sohrabi et al, 2020] The pandemic came in waves, one after the other since January 2020 and which showed slight decline in cases only to come back more vigorously. It caused havoc on the health care system, and has disrupted hospital services routine not only in the Philippines but globally [WHO news art.]. During the pandemic, frequent curfew, lockdowns and restrictions on movement of people and transport forced people to stay at home. Due to difficulty of accessing health services during these times, non-urgent intervention had been postponed more as a general rule without exception.

This study will look into the cancellation of elective surgery in a government hospital from January 2022 to December 2022 with the following objectives: 1.) to determine the number of cancellation of elective surgery in a government hospital in 2022, 2.) to determine the cause of the cancellation and 3.) to analyze the significance of the findings and generate recommendations.

A case cancellation and long waiting of patients scheduled for surgery reflects that an OR is not utilized efficiently and reflects on the hospital administration which is overall responsible for efficient and timely delivery of health care that includes timely surgery [Dexter, et al 2002].

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## METHODS

A study lasting for four months was done in two main teaching medical centers in Iran. Research design is prospective cross sectional type. There was a researcher-made questionnaire for patients, family and medical staff. The respondents were 315 of the sample population. (Armoeyan, M, et al, 2021).

Another study utilized the National Cancer database which included all patients diagnosed with stage I-III colon cancer treated with curative surgery. The delays which are long and short were classified as lower and upper quartile from time of diagnosis to therapy, respectively. The age, sex, race, tumor stage, location, adjuvant treatment, comorbidities, socioeconomic factors were all plotted between each group. Multivariable Cox regression model was used to identify the impact. (Grass, F, et al, 2020).

There was this research done in the USA last January 2011 to January 2016 that uses an integrative literature. It was conducted using four databases (CINAHL, PubMed, Embase and Cochrane). These are the contents of the database where the conclusions were based: ambulatory surgery, day surgery center, elective surgical procedure, elective operation, elective surgery, schedule, access to care, surgery cancellation, operation cancellation and surgery delay. (Taalwah N.A, et al, 2019)

A London, UK setting was used by researchers with a data sample of 5,288,604 elective surgery patients for a one year period. A binary dependent variable indicated whether the cancelled surgery was based on patient or hospital covariates. (Mcintosh, B, et al, 2012).

In relation to COVID 19 pandemic, a global expert response study was conducted to reveal projections for the proportion of elective surgery that would possibly be postponed during 12 weeks of peak disruption. A Bayesian  $\beta$ -regression model was used for 190 countries. The study used elective surgical case-mix data. (Nepogodiev, D., et al)

In Western Uganda, a cross-sectional study design was conducted to patients scheduled for elective surgery which were either cancelled or deferred on the actual day of scheduled surgery. STATA version 15 was helpful in the data analysis. (Bienfait, MV., et al, 2021)

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## RESULTS

There was significant correlation between emotional effects in the patients and the families and the reasons for cancellation and informants (Armoeyan, 2021). The physical and emotional effects were higher in men (52.4%) than in women (47.6%) (Armoeyan, 2021). Male patients, patients from lower socioeconomic groups and older patients had higher incidence rates of cancelled procedures (Mcintosh, 2012). General surgery cancellation was the highest (incidence rate of 21%). Most cancellation causes are preventable (86.5%) compared to non preventable (13.5%) (Taalwah, 2019). The highest cancellation of elective surgical operations was in the general surgery department with 81% elective cases cancelled or deferred, followed by the orthopedic department 10% and gynecology department 9%. The most common reasons for cancellation were patient-related (39%) and health worker-related (35%) factors. Cancellation was mainly due to lack of finances which accounted for 23.3% of the patients, inadequate patient preparation (16.6%) and unavailability of surgeons (15.5%). Major elective surgeries were cancelled 1.7 times more than minor elective surgeries (Bienfait, 2021).

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## DISCUSSION:

The surgery cancellation is one of the issues in the general hospital based on the study findings (Rahimi, 2017). It is known from cancellations under normal circumstances that patients can experience feelings of sadness, disappointment, anger, frustration and stress (Herrod et al, 2019). There was a significant correlation between emotional effects in the patients and the families and the reason for cancellation and informants (Amoeven et al, 2021). With the shift in the focus of care, surgical management of patients eventually changes as well. Surgical care that is not essential or time-critical was delayed and deferred to a later date when the pandemic subsided (Brindle, 2020)

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## REVIEW OF RELATED LITERATURE:

Cancellation of elective surgery may cause significant impact on the patients, their families, the institution and the surgeons as well. Cancellation of elective surgery has the most effect on the patients. It is known from cancellations under normal circumstances that patients can experience feelings of sadness, disappointment, anger, frustration and stress (Herrod et al, 2019). Short notice cancellation has a negative psychological effect on patient satisfaction and causes significant disappointment and frustration for patients and their families (Dimitriadis, et al, 2013). In a study conducted by Mosven Amoeven in 2021, entitled, The Effects of Surgery on Patients, Families and Staff, results revealed that the frequency distribution of all physical and emotional effects was higher in men than in women though it was not statistically significant. The most prevalent physical effects in the patients were hunger, thirst, and headache, respectively. The average cost of each surgery cancellation for the patients was almost twice that for the family members. There was a significant correlation between emotional effects in the patients and the families and the reason for cancellation and informants (Amoeven et al, 2021). According to the study conducted by Grass, et al in 2020 on the Impact of Delay to Surgery on Survival in Stage I-III Colon Cancer, they found out that delaying time-sensitive elective operations, such as cancer or transplant surgery, may lead to deteriorating health, worsening quality of

life, and unnecessary deaths (Grass et al,2020). Surgery cancellation has a significant impact on patients' life ,health, resources, cost, and quality of care. It is difficult to devise a solution without understanding the cause of cancellations ( Talalwah et al,2019).

Next to be affected by cancellations of elective surgery are the surgeons. Uncertainty of the scheduling, possible transfer of service and worsening status of the patient's health are inevitable possibilities. Of particular note, information related to surgical services in a pandemic was scarce on the WHO website (WHO Coronavirus Technical Guidance,2020). As a result of this, many surgical practitioners, including anesthesiologists and other health professionals involved in the care of surgical patients have formulated their own policies and guidelines , considering foremost their own safety rather than the delivery of needed services to the surgical patients. Because of the shift in the focus of care, surgical management of patients eventually changed as well. Surgical care that is not essential or time-critical was delayed and deferred to a later date when the pandemic subsided (Brindle, 2020). However, even in the midst of a pandemic certain procedure types were performed, including appropriate cancer treatment, emergency surgery and urgent transplantation, as these are considered life-saving procedures with curative potential. A complete neglect of certain surgical services were considered unwanted collateral damage, and inadvertently increased the number of deaths and life-years lost owing to the COVID-19 pandemic. This created ethical dilemmas at a time of scarce resources and high pressure on critical care staff ( Ives,2020).

During the early period of the pandemic, many surgical practitioners presented many different views, some of them contrasting each other as to how the surgical services should be approached and managed. With some early reports of a high risk of postoperative morbidity and death in patients exposed to COVID-19 at the time of surgery( Lei et al,2020) , a set of minimum screening initiatives were done until better data are available. For patients with urgent and non-emergency surgical conditions requiring operation, before admission (or on admission in a pathway evaluation if admitted semi urgently) there was an interview with attention to sick contacts and extent of social isolation performed. A single swab with PCR or chest CT on the day before surgery to screen for COVID-19 was recommended by some (Ai T,et al,2020). The applicability of these measures changed as knowledge, testing capability and sensitivity evolve, and with prevalence of COVID-19 (and evolving immunity) among the public.

The lack of consensus among medical Doctors prompted the different medical and surgical societies to come up with policies and guidelines in order to somehow relieve the impact and pressure of the pandemic among the medical and surgical practitioners. Having the feeling of a sense of urgency yet considering as well the safety and welfare of the practitioners and patients, experts patiently deliberated issues and concerns , set acceptable criteria , and kept themselves abreast with the ever changing developments in the battle against COVID virus in order to come up with acceptable guidelines for the practitioners. In the Journal of MinimInvasive Gynecology 2020, published online on May 7,2020,the Philippine Society for Gynecologic Endoscopy issued an official statement on Minimal Invasive Gynecologic surgeries during the Covid Pandemic in the Philippines supporting the suspension of elective surgeries,yet recognizing as well the occasions when surgery may be deemed urgent and cannot be delayed. In those instances, the society recommended several measures to guide the practitioner and the institutions such as the provision of full PPE for the surgical team, necessity for patients to undergo preoperative assessment and testing, measures to contain carbon dioxide release during the procedure and maximum use of non electrosurgical or ultrasonic measures for hemostasis ( PSGE Statementon MIMS). An advisory akin to this was also issued by the Association of Gynecological Endoscopy Surgeons(AGES) on Laparoscopic and Hysteroscopic procedures during the COVID 19 pandemic which was published in the Nigerian Journal of Clinical practice (Alabi,2020) .

Cancellations of elective surgery also cause losses on the institution directly through loss of income and indirectly through a possible miss of a good surgical candidate. A research study at Tulane University Medical Center in the United States in 2009 reported that 6.7% of scheduled elective outpatient surgeries were canceled, costing the hospital nearly \$1 million (Magnusson, et al,2011) . A similar research study conducted by McIntosh B et al in 2007 in the United Kingdom showed that almost 88 million dollars was lost for cancelling operations at the last minute because of hospital related reasons including lack of preanesthesia evaluation. The problem of last-minute changes in a surgical schedule is complex and involves multiple clinical systems such as the day surgery unit (DSU), operating room (OR), OR scheduling team, postanesthesia care unit (PACU), and intensive care unit (ICU). When the surgical scheduling team fails to update the DSU about a surgical case sequence change, the patient waiting time for surgery becomes uncertain, nursing assignments change, and workload increases. These consequences distress the DSU nurses, hindering their ability to prioritize patient needs and work as a team. In the event of cancellation, the OR workflow is interrupted, instrument kits previously prepared must be returned to central supply, resources are wasted, and the use of the room is reduced (Talati et al, 2015). Therefore, understanding the reasons for cancellations is essential to reduce the cancellation rate ( Pohlman , et al,2012).

What are the possible reasons behind cancellation of scheduled elective procedures. Elective surgery cancellation is a multifactorial problem that is documented worldwide and can vary from one hospital to another. Documentation is with ease because hospital records, particularly operating room records, are well kept and appropriately documented starting from surgical procedure proposals. Non preventable cause of cancellation is a medical emergency and a preventable one is lack of specific surgical need/instrument (Chalya et al,2011). In an integrative review conducted by Talalwah regarding the causes of cancellation of surgery wherein he identified 23 literature sources and conducted a randomized controlled trial to determine the causes of cancellations, he was able to classify the causes into three categories: hospital related reasons, patient related reasons an surgeon related reasons. Evidence revealed that most cancellations were avoidable (Talalwah et al,2020). A related study which was conducted by Dhafar et al in Saudi Arabian hospitals revealed that 86.5% of cancellations were preventable whereas 13.5% were non preventable (Dhafar et al,2015). An article published in the Malaysian Journal of Public Health Medicine, 2017, entitled Reasons for Surgery Cancellation in a Public Hospital in Iran ,identified the causes and reasons of surgery cancellation. The prevalence of surgery cancellation was also determined.The study showed that the majority of the cancellation was due to avoidable reasons. The highest number of cancellations occurred in the General Surgery, Orthopedic Surgery and Gynecology Surgery. The most common causes for surgery cancellation were due to patient medical problems and patients refusing the surgery. The least one cause was due to problems with facilities. The prevalence of the cancelation was not high but nearly 70 % of the cancelation could be avoided. The surgery cancelation is one of the

issues in the general hospital based on the study findings (Rahimi, 2017). In the study conducted by Bienfait et al regarding the factors associated with cancellation and deferment of elective surgical cases at a rural private tertiary hospital in Western Uganda, they were able to conclude that cancellation and deferment of elective surgeries is still of a major concern in this private rural tertiary hospital with most of the reasons easily preventable through proper scheduling of patients, improved communication between surgical teams and with patients and effective utilization of available resources and manpower. In their study, four hundred patients were scheduled for elective surgery during the study period, among which 90 (22.5%) were cancelled and 310 (78.5%) had their surgeries as scheduled. The highest cancellation of elective surgical operations was observed in the general surgery department with 81% elective cases cancelled or deferred, followed by the orthopedic department 10% and gynecology department 9%. The most common reasons for cancellation were patient-related (39%) and health worker-related (35%) factors. Other factors included administrative (17%) and anesthesia related factors (9%). Cancellation was mainly due to lack of finances which accounted for 23.3% of the patients, inadequate patient preparation (16.6%) and unavailability of surgeons (15.5%). Major elective surgeries were cancelled 1.7 times more than minor elective surgeries (Bienfait, et al, 2021).

Another interesting and more extensive research was the one organized by the National Institute for Health Research in Birmingham, UK. In this study they tried to determine the rate of cancellation of surgeries among hospitals in all UN member countries for a twelve week period during the COVID pandemic period. From there, they tried to formulate a global predictive model of surgery cancellations and determined as well the period of surgical recovery or the period hospitals would take in order to be able to clear all the backlog operations emanating from the cancellations. The best estimate was that 28,404,603 operations would be cancelled or postponed globally during the peak 12 weeks of the COVID-19 pandemic. Worldwide 2,367,050 operations would be cancelled per week, with 11 countries cancelling more than 50,000 operations per week. Most of the cancelled or postponed operations were estimated to be for benign disease (90.2 per cent, 25,638,922 of 28,404,603), followed by cancer (8.2 percent, 2,324,070 of 28,404,603) and obstetrics (1.6 per cent, 441,611 of 28,404,603). The best estimate was that the global 12-week cancellation rates would be 72.3 percent (28,404,603 of 39,275,857) overall, 81.7 percent (25,638,922 of 31,378,062) for benign disease surgery, 37.7 percent (2,324,070 of 6,162,311) for cancer surgery and 25.4 percent (441,611 of 1,735,483) for obstetrics. Overall, 12-week cancellation rates by the World Bank region would range from 68.3 to 73.0 percent. The most cancellations were projected to take place in Europe and Central Asia (8,430,348 procedures) and the least in Sub-Saharan Africa (520,459), reflecting the low baseline surgical volume there. The surgical recovery period was estimated as well out of this information. Based on a 20 percent increase in baseline surgical volume, it was estimated that it would take countries a median of 45 (range 43–48) weeks to clear the backlog of operations resulting from 12 weeks of disruption due to COVID-19. If baseline surgical volume were increased by 10 percent, it would take countries a median of 90 (86–95) weeks to clear the backlog, whereas with a 30 percent increase in baseline surgical volume this would take a median of 30 (29–32) weeks (Nepogodiev et al, 2020).

Anticipating the coming of the period under the new normal in which the public health category of COVID 19 might be shifted from pandemic to endemic, new challenges would eventually be faced by health care institutions which could entail additional expenses with doubtful return of investments. It will definitely not be an easy task nor can it be as simple as going back to the hospital practices prior to the pandemic in as much as health care institutions should always be vigilant and prepared for the coming of another possible wave of Covid infections somewhere along the way. For these reasons, there is a need for re engineering of hospital facilities, integrating places previously designated as isolation facilities, setting up new isolation areas with ante rooms, equipping rooms with filter mechanisms, preparing for backup staff should a personnel need to be isolated and quarantined and other infrastructures designed to keep the institution safe and ready to handle health problems under the new normal condition. For public hospitals subsidized by the government these adjustments may not be so much of a problem, but for private health care institutions these would mean additional expenses which they would have to pass on to their patients. There is indeed no need to emphasize, as it is very obvious, the need to have an efficient and reliable surgical services in as much as it is in these procedures where hospital can have a significant return of their valued investments. Therefore cancellations especially of elective procedures should really be minimized if not totally be avoided.

In the Philippine setting, studies concerning the effects of cancellations of elective surgeries are quite limited. Much of the studies done are focused on the E-learning method of teaching among Philippine schools (Oducado, et al, 2020), the knowledge attitudes and practices regarding the pandemic (Leehang, 2020), impact of the COVID 19 pandemic on physical and mental health (Tee, 2020), to mention a few. During the early period of pandemic when healthcare institutions were reportedly overwhelmed by the huge volume of patients with COVID infections, so much so that even big and modern hospitals in the country had to build covid facilities outside their hospital buildings, numerous reports over the media and newspapers circulated regarding the nonpayment of hospitals by the government's health insurance corporation. Several hospital had to stop their operations due to high cost of operation and inadequate staff to care for COVID patients. Even up to now, in the January 11, 2022 issue of the Philippine Daily Inquirer, the Philippine health insurance is being urged to pay hospital claims amounting to around 25.45 billion Philippine money (Mercado, 2022). Not to mention the fact that these figures may have been produced out of the very strict scrutiny by Philhealth. Meaning to say, these amount may only be the tip of the iceberg as there is the possibility that many more claims submitted to Philhealth were either denied or returned back to the hospital. In a study done in the Philippine General Hospital by Tabunara and Dominado, in the year 2021, regarding hospital expenditure of COVID 19 patients at the PGH with Philhealth coverage, the following results were obtained. Of the 691 COVID-19 patients included during the study period, 55.72% were male, mostly belonging to the 61-70 age range with a median age of 58. The average in-hospital stay was 14.20 days, and 76.99% were under charity services, with the moderate (42.84%) and mild (25.33%) pneumonia cases accounting for 68.17% of the admissions. Total hospital expenses clustered around Php 51,000 to 200,000 (~USD 1,041 to 4,156), most spending between Php 101,000 to 150,000 (~USD 2,078 to 3,118). The top three cost centers and expenditure sources were pharmacies, personal protective equipment (PPE) usage, and laboratory. The average out of pocket payment for patients less than 60 years old was higher, ranging from Php 25,899 to Php 44,428.63 (USD 538 to USD 924.44) compared to patients older than 60 (Php 4,005.60 to Php 32,920.20 ~ USD 83.35 to 684.98). The most out of pocket charges were for the age group 19-30, amounting to Php 44,428.63 (USD 924.44). The study only goes to show how much health institutions had been spending and perhaps losing from nonpayment by health insurance corporations. Thus the need to have an efficient

and effective management of health services that may be offered by healthcare institutions is an absolute necessity in order to defray its huge operational expenses. Only by knowing, analyzing and acting upon the different factors that may contribute to improving efficiency of hospital operations can sustainable hospital operation be achieved. Through this end, this study aims to contribute.

**Table 1: SUMMARY OF RESULTS:**

Author and Year	Title	Country	Results
Armoeyan,M; Aarabi A, Akbari L; Dec, 2021	The Effects of Surgery Cancellation on Patients, Families and Staff; A Prospective Cross Sectional Study;	Isfahan, Iran	-Frequency distribution of all physical and emotional effects was higher in men (52.4%) than in women (47.6%) although not statistically significant -The average cost of surgery cancellation was twice that for the family members --Negative impact on over all- highest incidence rate of cancellation is general surgery
- Grass F, Behm KT, Duchalais E, Crippa J, Spears GM, Harmsen WS Hubner,M; Mathis K; Kelly S Pemberton J; Dozois E; Larson D March ;2020	Impact of Delay to Surgery on Survival in Stage I-III Colon Cancer	USA	- There is statistically significant negative impact on overall survival when treatment was delayed beyond 40 days after diagnosis in patients with non metastatic colon cancer
Talalwah N.A, Mciltrot KH;” Feb 2019	Cancellation of Surgeries: Integrative Review	Dharan, Saudi Arabia	-General surgery cancellation was the highest (incidence rate of 21%) - Most cancellation causes are preventable (86.5%) compared to non preventable (13.5%)
Mcintosh B;Cookson G;Jones S; April 2012	Canceled Surgeries and Payment by Results in the English National Health Service	London , UK	-Male patients, patients from lower socioeconomic groups and older patients had higher incidence rates of cancelled procedures
Nepogodiev D;Omar,O;Glasbey J; Li Simoes F;Abbott T; Ademuyiwa A;Biccard B;Chaudrhry D;Davidson G; Oct, 2020;	Elective Surgery Cancellations due to the Covid-19 Pandemic: ; Global Predictive Modelling to Inform Surgical Recovery Plans	National institute for Health, United Kingdom	Predictors of cancellation are ; .- Most of the cancelled or postponed operations were estimated to be for benign disease (90.2 percent), -The best estimate was that the global 12-week cancellation rates would be 72.3 percent, 81.7 percent for benign disease surgery, 37.7 percent for cancer surgery and 25.4 percent for obstetrics . -Overall, 12-week cancellation rates by the World Bank region would range from 68.3 to 73.0 percent.

<a href="#">Bienfait MV, Katembo F, Sikakulya</a> - June 2021	Prevalence and Factors Associated with Cancellation and Deferment of Elective Surgical Cases at a Rural Private Tertiary Hospital in Western Uganda: A Cross-Sectional Study	Western Uganda	-90 patients (22.5%) were cancelled and 310 (78.5%) had their surgeries as scheduled. -The highest cancellation of elective surgical operations was in the general surgery department with 81% elective cases cancelled or deferred, followed by the orthopedic department 10% and gynecology department 9%. - The most common reasons for cancellation were patient-related (39%) and health worker-related (35%) factors. -Cancellation was mainly due to lack of finances which accounted for 23.3% of the patients, inadequate patient preparation (16.6%) and unavailability of surgeons (15.5%) - Major elective surgeries were cancelled 1.7 times more than minor electives surgeries
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## THEORETICAL FRAMEWORK:

Cancellation of cases on the scheduled day of surgery leads to inefficient utilization of theatre space, waste of valuable manpower and scarce resources for patients and hospitals. (Kolawole,2002) Therefore, in order to minimize the rate of cancellations, it is important to have knowledge on the magnitude and causes of the problem. Cancellation of elective surgical procedures is a major problem. However, despite the magnitude of the problem, little work has been done to evaluate the extent and causes of this problem.

This study is supported by the Theory of Magnitude which there is substantial evidence to support the idea of common processing mechanisms for time, space, and number. The model proposes that time, which refers to the surgical wait time, numbers corresponding to the incidence and space pertaining to the operating procedure and location are influenced by each other. But this is constrained by the evidence largely coming from perceptual or psychophysical studies. A clearer understanding of the developmental processes involved in the construction of magnitude representations. (Walsh, 2014)

Theory of constraints focuses on continuous improvement philosophy by dealing with constraints. According to Goldratt (1990), while dealing with constraints three basic questions about change are required to be answered: what to change, what to change to and how to cause change? Goldratt's Theory of Constraints is essentially about change and the Five Focusing Steps are directly concerned with these three basic questions about change that every manager needs to know. To determine what to change is looking for constraints; to determine what to change to, defining how to exploit constraint and subordinate other operations; to determine how to cause change is the elevate step (Dettmer, 1997) An alternative approach to assess and provide solutions to the problem of elective surgery late cancellations is to apply a strong management tool, one of which is the theory of constraints as published by Eliyahu Goldratt in 1984 in his book "The Goal". According to the theory of constraints, late cancellations of surgical care are just undesirable effects of underlying causes. (Abderrazak Sahraoui et al, 2014)

Hume's theory of causation is one of the most famous and influential parts of his philosophy. Hume's account of causation is part of his theory of human nature or "science man." His theory of causation, therefore, is not primarily a metaphysical account of what causality consists in, although it has implications for that. Rather, it is an investigation of two main questions. First, how do human beings come to have the idea of causation? Second, how do human beings come to be able to infer effects from causes and causes from effects. (Martin Bell, 2009)

## CONCLUSION:

Short notice cancellation has a negative psychological effect on patient satisfaction and causes significant disappointment and frustration for patients and their families (Dimitriadis, et al,2013) . Surgery cancellation has a significant impact on patients' life, health, resources, cost, and quality of care. It is difficult to devise a solution without understanding the cause of cancellations. Most cancellation causes are preventable(86.5%) compared to non preventable (13.5%) (Talalwah, 2019). Therefore, understanding the reasons for cancellations is essential to reduce the cancellation rate (Pohlman , et al, 2012).

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## CONFLICT OF INTEREST:

The researchers declare no conflict of interest.

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