

DEDICATION

To my dear mother

Amna to whom I am indebted for the rest of my life

To the soul of my *honorable father*

Shamsudin Mohammad Yousuf

To my loyal wives

Madina and **Hanadi** for their support and encouragement

To my lovely sons **Muhannad, Moayad, Basil,** and **Munzir**

To my sweet daughters **Reham, Weam** and **Rawan**

To all those I love

Mohammad Shamsuddin Yousuf

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ABBREVIATIONS

AHRQ	Agency for Healthcare Research and Quality
ANOVA	Analyses Of Variance
BPR	Business Process Reengineering
CBAHI	Central Board for Accreditation of Healthcare Institutions
CPOE	Computerized Physician Order Entry
CQI	Continuous Quality Improvement
CSFs	Critical Success Factors
DRIP	Data Rich Information Poor
HIS	Health Information System
MOH	Ministry of Health, Saudi Arabia
IHI	Institute of Healthcare Improvement
IT	Information Technology
IOM	Institute of Medicine
MBNQA	Malcolm Baldrige National Quality Award
MFI	The IHI Model for Improvement
NHS	National Health Services
PDCA	Plan, Do, Check, Act
PDSA	Plan, Do, Study, Act
QA	Quality Assurance
QC	Quality Control
QI	Quality Improvement
QIP	Quality Improvement Project
QIT	Quality Improvement Team
REC	Research and Ethics Committee
SPC	Statistical Process Control
SPSS	Statistical Software for Social Sciences
TOC	Theory of Constraints
TQM	Total Quality Management
UK	United Kingdom
US	United States
WHO	World Health Organization

Abstract

The healthcare system in Saudi Arabia has serious problems with quality and safety despite the enormous fiscal expenditure by the government. There is evidence that Saudi Arabia has used some quality improvement models such as TQM to improve healthcare services during the last two decades. However, the results are still far beyond expectations. This study aims to evaluate the quality of healthcare services in Saudi hospitals using a quality improvement model. A three-phase sequential mixed method was used. In Phase one a proposed model for QI was developed using primary data from questionnaires and interviews and secondary data from literature review. The model was refined by 12 quality experts and pilot using one group pretest, posttest approach. Phase two involved selecting three hospitals for application of the model in real life settings. In Phase three multiple true experiments using Pre-test Post-test control-group design were conducted to evaluate the effect of the model on randomly selected clinical indicators. QI implementation in Saudi hospitals was found to be significantly low as measured by seven dimensions adapted from the literature with (P -value = < 0.05). The experimental study revealed significant differences between the pretest and posttest measurements in the experimental group in the three hospitals (p-value 0.035, 0.004, 0.006 consecutively) while there were no changes in the control group. This means, the proposed model has led to significant positive improvements in the experimental group. We also found no difference in the experimental group after six months of the intervention in the three hospitals (p-value 0.157, 0.704, 0.804 consecutively). This means, the improvement has been sustained after the intervention. Finally,

the results showed that participants have significantly positive perceptions about the model (p-value 0.000). Apparently, there are four key factors influencing the implementation of quality improvement in Saudi hospitals. These are: organizational culture, human resources utilization, processes and systems, and structure. This study provides evidence of what quality techniques and tools facilitate successful quality improvement implementation in the Saudi context. Recommendations for Saudi hospitals are to consider these practical strategies in order to increase chances of improving and sustaining improvement. Limitations are that, this study involved three MOH hospitals only and that other governmental and private hospitals were not involved.

الخلاصة

يعاني النظام الصحي في المملكة العربية السعودية من مشاكل حقيقية في الجودة والسلامة رغم ما تصرفه الدولة من مبالغ مالية كبيرة على الخدمات الصحية. لقد استخدمت المستشفيات السعودية خلال العقدين الماضيين بعض نماذج تحسين الجودة مثل إدارة الجودة الشاملة ولكن النتائج كانت وما زالت دون التوقعات. تهدف هذه الدراسة لتقييم جودة الخدمات الصحية في المستشفيات السعودية باستخدام نموذج لتحسين الجودة. وتتضمن الدراسة ثلاثة مراحل استخدمت فيها طرق كمية ونوعية. في المرحلة الأولى تم تطوير نموذج لتحسين الجودة باستخدام بيانات أولية من الاستبيانات والمقابلات الشخصية وبيانات ثانوية من مراجعة الأدبيات المنشورة، وقد تم تنقيح النموذج من خلال المراجعات والمداخلات من اثني عشر خبير جودة كما جرى تطبيق تجريبي للنموذج في أحد المستشفيات باستخدام مجموعة واحدة للاختبار القبلي والبعدي. وشملت المرحلة الثانية اختيار وتهيئة ثلاثة مستشفيات لتطبيق النموذج، بينما تضمنت المرحلة الثالثة إجراء تجارب حقيقية متعددة ومتزامنة في المستشفيات الثلاثة باستخدام مجموعة اختبار ومجموعة ضابطة والقياس القبلي والبعدي لمعرفة تأثير النموذج المقترح على مجموعة من مؤشرات الجودة، كذلك تم القياس بعد ستة شهور من انتهاء عمل الفرق لقياس مدى استدامة التغيير، كما تم تقييم تجربة المستخدمين للنموذج باستخدام الاستبيان ومراجعة المحاضر والتقارير والوثائق. وقد تبين من قياس تطبيق الجودة باستخدام سبعة معايير للقياس أن مستوى تطبيق تحسين الجودة في المستشفيات السعودية منخفض بدرجة كبيرة حيث كانت قيمة بي أقل من (0.05). وقد أظهرت الدراسة التجريبية وجود فروق كبيرة بين قياسات الاختبار القبلي والبعدي في المجموعة التجريبية في المستشفيات الثلاثة (قيمة بي 0.035، 0.004، 0.006 على التوالي) في حين لم تكن هناك تغيرات في المجموعة الضابطة. وهذا يعني أن النموذج المقترح أدى إلى تحسينات إيجابية كبيرة في المجموعة التجريبية. ووجدنا أيضاً عدم وجود فروق في القياسات القبلية والبعدي في المجموعة التجريبية بعد مرور ستة أشهر من التدخل وذلك على مستوى المستشفيات الثلاثة (قيمة بي 0.157، 0.704، 0.804 على التوالي) وهذا يعني استدامة التحسين بعد انتهاء التدخل. كذلك أظهرت النتائج قبول إيجابي كبير لدى الفرق المشاركة (قيمة بي 0.000). وأخيراً تبين وجود أربعة عوامل لها التأثير الأكبر على تطبيق الجودة في المستشفيات السعودية وهي: ثقافة المنشأة، استخدام الأمثل للموارد البشرية، العمليات والأنظمة،

والموارد، ولذا تقترح هذه الدراسة عدد من الممارسات العملية التي من شأنها مساعدة المستشفيات السعودية في معالجة هذه العوامل وتحسين فرص نجاح جهودها في تحسين الجودة، وختاماً فإن أهم محددات هذه الدراسة عدم تناولها للمستشفيات الحكومية الأخرى والمستشفيات الخاصة.