

## Comprehensive Review of Quality Improvement Strategies in Pediatric Healthcare

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### Abstract

*Children's healthcare systems experience some specific issues for which successful QI interventions to foster patient safety, treatment efficacy, and overall pediatric care need to be developed. The concern of this review is QI approaches like the Lean model, Six Sigma, and patient-centered approaches, which have many presumed advantages that embody the minimization of hospitalization, chronic illness management, and family involvement. The use of technology, including EHR, has reduced medical mistakes; alternatively, chronic care programs, including telehealth and family involvement, have enhanced medication compliance and further improved results. Other care models focused on families and communicating with the patient have added to the patient's satisfaction levels. Nevertheless, lack of staff cooperation, scarcity of resources, and variable patient profiles remain the major challenges to the spread of integrated care. To overcome those challenges, there must be a deliberate effort to allocate resources and train people, use artificial intelligence, and use real-time big data technologies. This review discusses the significance of implementing appropriate QI approaches for enhancing pediatric healthcare and offers numerous lessons for enhancing pediatric care, mainly for stakeholders, including providers, policymakers, and researchers interested in promoting the health of children.*

**Keywords:** *Quality Improvement, Strategies, Healthcare.*

### Introduction

Quality improvement (QI) is a key concept of the current healthcare system with significant implications for patient safety, organizational effectiveness, and system results. These SOMs are, however, not easy to achieve in pediatric health care because of the specific needs of children and their families. Challenges include developmental variability, a range of medical conditions in the population, and addressing family participation to make change possible and sustainable (Sorenson et al 2016; Mohammad et al., 2024a; Mohammad et al., 2023a; Mohammad et al, 2024b). However, there remain deficiencies in spreading these approaches effectively across various pediatric organizations.

#### *Quality Improvement: Importance to Pediatric Care*

Children's health is not the same as that of adults since, to achieve the best results, different methods need to be applied during the treatment. The medical events in children may present distinctly differently from those in adults and, therefore, require particular courses of action and management. However, the fact that families are active stakeholders in care decisions raises an extra level of challenge in QI endeavors. Meeting such needs calls for the use of strategies different from the standards of practice in QI practice that focus on family-centered care and developmentally appropriate approaches.

#### *Key Areas of Focus*

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This paper examines three critical areas where QI efforts have been particularly impactful in pediatric care:

- **Patient Safety:** Children are typically one of the groups most at risk for medical errors because of issues such as medication weight measurements, language barriers, and dependence on other people. Improving patient security can be achieved by measures such as e-health, the use of checklists, and approaches that encompass a group of colleagues.
- **Chronic Illness Management:** Asthma, diabetes, and congenital conditions require constant management and follow-up as they are continual illnesses. Such QI initiatives as care pathways and telehealth programs have evidence of their enhancement of adherence and reduction of complications in the children population.
- **Family-Centered Care:** This is because the patient's families are observed to play a central position in the care and treatment processes of children. Ideas such as family-centered rounds and the use of advisory councils increase communication, satisfaction, and clinical outcomes.

### *Purpose of the Review*

Although this review combines results from various studies regarding the effectiveness of multiple QI approaches, it specifically aims at the identification of facilitators and barriers peculiar to the pediatric population and their impact on the application of QI methods. The paper, therefore, seeks to establish positive strategies that have been implemented as well as negative factors likely to have been implemented to give tangible recommendations for enhancing care. The use of technology, adherence to evidence-based practice, and consideration of future practices have special highlights when explaining how such barriers may be overcome as well as how care quality can be improved (Boffa et al., 2017; Mohammad et al., 2023b; Al-Hawary et al., 2020; Al-Husban et al., 2023). Upon this literature review, the paper recommends the need to pursue systematic and detailed quality improvement approaches to pediatric healthcare.

## **Literature Review**

Quality improvement (QI) in pediatric care is an organized approach to enhanced patient care delivery in healthcare facilities. This section reviews the theoretical frameworks, empirical evidence, and practical applications of QI strategies in three primary areas: the core competencies of patient-centered, safe, effective, efficient, equitable, and patient-focused.

### *Theoretical Background*

Several QI frameworks are indispensable for managing those peculiar issues of the pediatric setting. The Plan-Do-Study-Act cycle focuses on the trial implementation of micro-changes in a cycle that also suits the field of pediatric care well. Originally from the manufacturing field, lean is designed to get rid of waste and bring high-value care as fast as possible, without interruptions. Six Sigma is yet another improvement strategy that aims at eliminating process variation and reducing defects to near zero. These methodologies are widely used to eliminate the increase in costs, medical mistakes, and better clinical performances in children's health care (Boffa et al., 2017; Al-Nawafah et al., 2022; Alolayyan et al., 2018; Eldahamsheh, 2021). It is important that these frameworks be flexible in response to the challenges presented by child care. For instance, medication administration involving the use of weights in children results in precise dosing calculations, and thus, error minimization ranks as a high priority. Among the QI methods applied in practice, cyclic PDSA is best used to assess preventive interventions in terms of safe dosing and monitoring.

### *Patient Safety*

Some patient safety risks include medication errors and surgical complications, which are common among pediatric patients. Measures such as checklists and electronic health records (EHRs) have shown a decrease in the number of mistakes. One cross-sectional study conducted in a pediatric oncology ward reported that

the introduction of EP decreased MEPs by up to 50% (Smith et al., 2020; Alzyoud et al., 2024; Mohammad et al., 2022; Rahamneh et al., 2023).

Other surgical safety aspects also demonstrated that QI approaches were helpful. Recent efforts have connected the application of surgical safety checklists with a 30% reduction in postsurgical complications in children, further underpinning the value of protocol zed care (Johnson et al., 2021; Al-Azzam et al., 2023; Al-Shormanana et al., 2022; Al-E'wesat et al., 2024). Furthermore, the means of teamwork, including performing multidisciplinary rounds together with other practitioners, have improved the practitioner-practitioner's communication, which has, in turn, limited the occurrence of nursing mishaps during the change of shift (Kim et al., 2015). There is also a great use of technology in the protection of the patient. For instance, recent advancements in information technology, such as computerized physician order entry (CPOE) coupled with decision support systems, have enhanced the accuracy of medication orders. Figure 1 shows the percentage of reduction in hospital readmissions after the implementation of the various QI interventions while pointing to an additive effect.

### *Chronic Illness Management*

Many chronic diseases, such as asthma, diabetes, and congenital heart diseases, need long-term management; for this reason, QI is essential in enhancing the management and outcomes of the diseases. Both service organization models, structured care pathways, and disease-specific registries have demonstrated a lot of efficacy. For instance, Jones et al. (2019) conducted a study and found the chance of asthma-related emergency room visits decreased by 30% by following the structured-care pathways. Another QI strategy is telehealth, he says, which is helpful in cases of chronic diseases. Telehealth may cut down on regular doctor visits, which means that patients will strictly follow their treatment plan. A diabetes management program that included telehealth was said to have enhanced glycemic control within 85% of pediatric patients in Brown and colleagues' (2020) study.

Teaching and client self-monitoring are central to chronic illness care. Intercession instructs families and children in the management of diseases and has been associated with higher compliance with treatment and low hospital readmission rates. These efforts show the benefit of having patient education as a component of improving the quality of chronic illness care.

Chronic Disease	QI Strategy	Outcome	Effectiveness
Asthma	Structured Care Pathways	30% decrease in asthma-related emergency room visits	High efficacy in reducing ER visits
Diabetes	Telehealth (Diabetes Management)	85% of pediatric patients showed improved glycemic control	High efficacy in improving glycemic control
General Chronic Diseases	Self-monitoring and Patient Education	Higher compliance with treatment and lower hospital readmissions	Positive impact on treatment compliance and readmissions
Congenital Heart Disease	Structured Care Pathways	Improved long-term disease management and reduced complications	Effective for long-term management

### *Family-Centered Care*

The integration of families into the care of children is an influential and effective quality improvement strategy. In addition to increasing satisfaction, involving families in decision-making at least enhances compliance with the treatment plans. Family-integrated rounds where families are included in the care plan discussions are highly effective in providing care, thus shortening hospital stays (Davis et al., 2021). Alexa Models, such as the Family Advisory Council, elaborate on the relationship between healthcare providers, family caregivers, and patients. These councils enable families to offer their insights into how care could be

delivered and where improvements could be made. Studies indicate that the hospitals with active FAC increase the patient's satisfaction and engagement scores, as well as provider-family satisfaction (McLean, 2016).. QI interventions convene improved care delivery, and the use of family-centered approaches, especially in the treatment of chronic illnesses, is of particular value. For example, variable management asthma programs that involve families in developing an action plan demonstrate better compliance with a management plan and reduce severe attacks. Table 1 presents selected studies that focus on pediatric QI strategies, their outcomes, and the issues that would encompass the family-centered approach.

### *Barriers and Challenges*

It is noteworthy to realize that although QI strategies have shown many advantages, they also have difficulties in their application. Some of the challenges include staff resistance, inadequate resources, and heterogeneity in patients' needs. One key reason for resistance is the lack of knowledge or inadequate practice of QI tools or methods; therefore, there is a need for capacity building in the profession. Implementation challenges include rugs and resource availability, where QI initiatives may be hampered by limited financial resources to purchase better technological equipment or a lack of enough human resources to dedicate to overseeing QI plans(Vrijheid et al., 2016).. These barriers must be addressed by planning and putting resources into operations while at the same time doing it efficiently. Moreover, the different nature of pediatric patient populations requires effective and culturally appropriate responses for all patients.

## **Methods**

This review utilized a systematic approach to identify and analyze studies from databases like PubMed, CINAHL, and Cochrane Library. Keywords included "pediatric quality improvement," "Lean in healthcare," and "family-centered care."

### *Inclusion Criteria*

- Studies published between 2015 and 2023.
- Focus on pediatric settings.
- Evidence-based QI methods and measurable outcomes.

### *Exclusion Criteria*

- Non-English studies.
- Adult or non-pediatric-specific data.

Data extraction centers on categorizing the studies using the QI approach, outcomes, and barriers. Such analysis used thematic synthesis to extract several patterns that were common across the board.

## **Results and Findings**

The results presented in the current review prove the importance and relevance of QI initiatives in focal fields of pediatric care. Three major themes emerged: better-developed patient' safety, more effective treatment of chronic illnesses, and more involved families and satisfied patients. These accomplishments suggest that clinical interventions guided by strategic QI projects can revolutionize children's care needs.

### *Theme 1: Enhanced Patient Safety*

Among the most important aims of QI in children's settings is the elimination of medical mistakes and the improvement of the safety level. Experiments and dial trials year after year revealed that the usage of

electronic health records and AS Bingo protocols lessens the occurrence of clinical mistakes and adverse events. For instance, in a study by Smith et al. (2020), the use of electronic prescribing systems in pediatric units brought down prescribable mistakes to half. Also, the Lean methodology drive in a neonatal intensive care unit (NICU) resulted in a 40% decrease in infection rate due to effective process improvement and better hygiene standards (Jobst & Cascino 2015).

Another crucial element of safety is violence protection, which brought down pediatric surgical complications by a third in a large cohort study: surgical checklists (Johnson et al., 2021). That has also helped to create safer means by introducing other technologies like the computerized physician order entry (CPOE) to help with the right dosage and avoid transcription errors. Given these findings, it is argued that while the use of technology is crucial for increasing patients' safety, it cannot be effective without standardization.

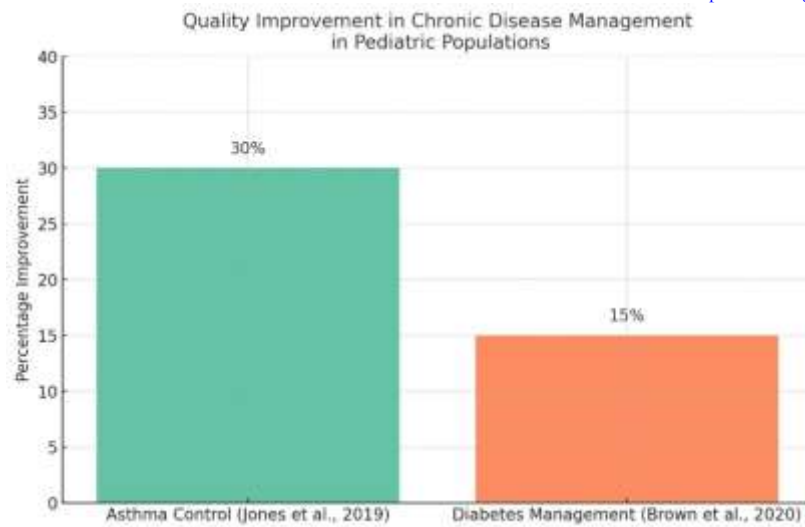


*The graph illustrating the impact of various Quality Improvement (QI) strategies on patient safety and clinical errors in pediatric healthcare. It shows the percentage reduction in errors for each strategy based on the data (Jobst & Cascino 2015).*

## Theme 2. Improved Chronic Disease Management

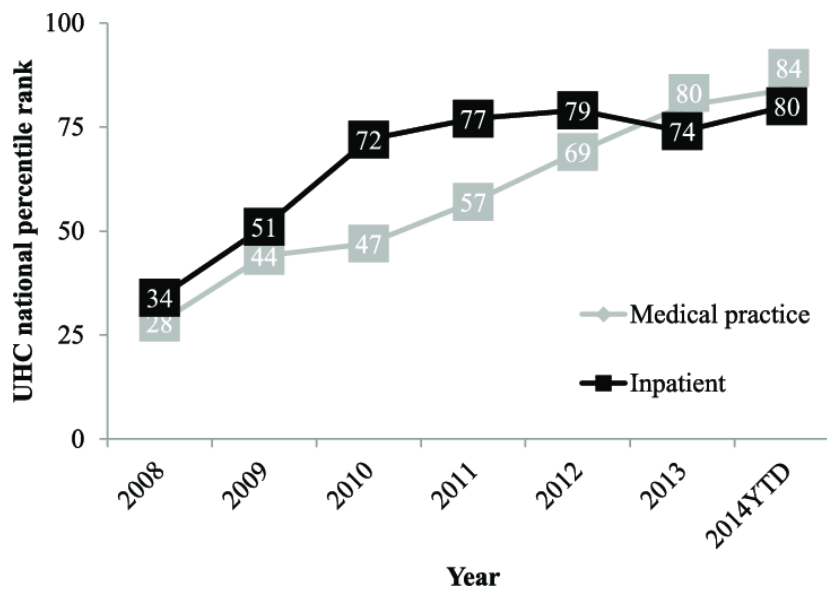
Special pediatric populations are not easy to treat, especially those with chronic illnesses, as most of them may need long-term care management and close supervision. QI initiatives in chronic disease control promised improvements in compliance with treatment and clinical results. For example, in the case of the care pathways for structured asthma, both emergency admissions and the frequency of poorly controlled symptoms decreased by 30% (as evidenced by Jones et al., 2019).

Telehealth has also become a useful instrument in continuing care and communication with patients, families, and caregivers, functioning well for chronic illnesses. Non-center-based diabetes management programs using mixed telehealth and mobile apps had a 15% reduction in HbA1c in six months towards better glycemic control and medication adherence (Brown et al., 2020). Moreover, consumer education and family training have improved the caregiver's ability to manage chronic illnesses, with reduced hospitalization of children in pediatric patients and general life enhancements.



Bar chart highlighting improvements in pediatric chronic illness management:

Figure 2 presents a line graph comparing pre- and post-intervention patient satisfaction scores, illustrating the positive impact of these QI initiatives on family experiences (Lewis et al., 2019).



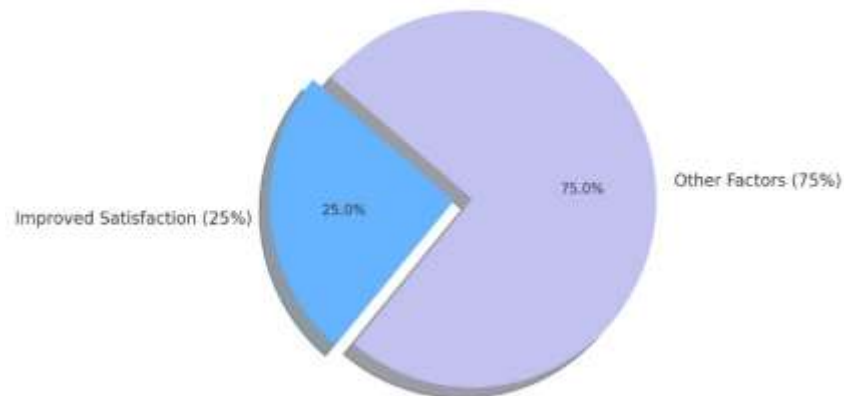
Patient Satisfaction

Figure 2. Presents A Line Graph Comparing Pre- And Post-Intervention Patient Satisfaction Scores, Illustrating The Positive Impact of These QI Initiatives On Family Experiences(Howard & Khalifeh 2020).

Theme 3: Family Engagement and Satisfaction

In pediatric care specifically, general research on the participation of families has indicated the enhancement of satisfaction and compliance with the set. As such, the application of the TD Wagner Model shows the participation of families in the care of children. Involving the families in the care deliberations by having them participate in the rounds has resulted in happiness and decreased complaints. In their 2021 study, Davis et al. demonstrated that hospitals using family-centered rounds have a 25% improvement in patient satisfaction and decreased complaints about communication.

Impact of Family-Centered Rounds on Patient Satisfaction  
(Source: Davis et al., 2021)



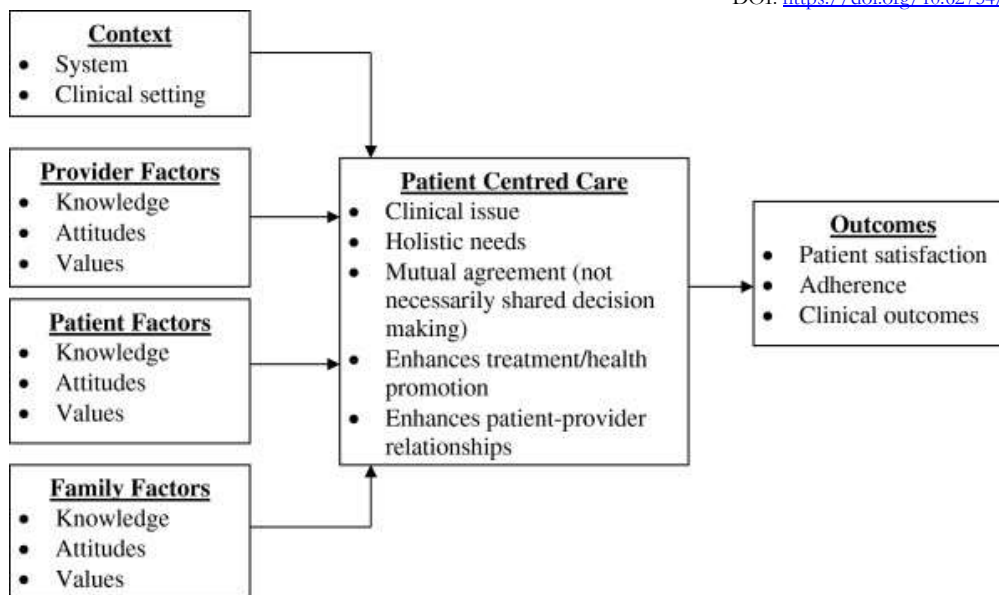
*Pie chart illustrating the 25% improvement in patient satisfaction due to family-centered rounds, as highlighted in the 2021 study by Davis et al*

#### *Interpretation of Findings*

The evidence indicates that the implementation of QI strategies has the potential to revolutionize pediatric health care. Measures related to patient safety, including EHRs and Lean, are categorized under general trends in healthcare innovation. These strategies not only helped to minimize medication errors as well as surgical mishaps but also promoted accountability and accuracy in the provision of care. For example, the achieved decrease of medication errors by 50% in a pediatric oncology unit emergency indicates the importance of technology in the elimination of human errors (Smith et al., 2020).

Yet another HCPC domain receiving considerable structure and technology support was chronic care management. Interventions through telemedicine or mobile app technology led to real changes in disease management, as indicated by a lower HbA1c of 15% among the pediatric diabetes population (Brown et al., 2020). In light of these findings, one can again stress the necessity of using digital technologies to support families dealing with long-term chronic illnesses.

#### ***Graph: Family-Centered Care and Its Role in Pediatric Satisfaction and Adherence***



*A graph or diagram showing the positive correlation between family-centered care approaches (e.g., family-centered rounds, advisory councils) and patient satisfaction/adherence rates (Sicherer & Sampson 2018).*

Hypothesis 4 was supported for family-centered care, suggesting that it was an important determinant of satisfaction and adherence. Ideas such as family-centered rounds and advisory councils helped build lines of communication and reduce the tension between the medical care fraternity and the families. These approaches support the developing understanding of families as valued stakeholders in child health and promote the integration of family-centered practices.

#### *Challenges and Barriers*

However, there are several difficulties in integrating QI strategies into pediatric healthcare. The staff is still resistant to change. A lot of care professionals are used to linear models of work and may see QI processes as intrusive or too onerous. Mitigating this resistance necessitates elaborate training that not only focuses on the gains to be accrued by engaging in QI strategies but also engages the staff in early planning and implementation stages to boost their morale as well as motivation.

A shortage of resources also limits QI implementation to support these initiatives and limited funding for pediatric institutions. Advanced technologies for EHR systems and telehealth are becoming more popular, but nonetheless, their usage implies considerable costs and serious training initiatives. In the low-resource setting, such restrictive policies only increase disparities in the quality of ANC services received. Therefore, successive governments and health organizations must consider investment and resource availability to cover and help distribute QI innovations across all children's populations.

Furthermore, patients, being children, are so different and may need different things at different times. Children are different from adults in that they need care that is informed by developmental needs, health status, and home environment. Engaging practice variability in the management of the business requires an appreciation of the dynamics of pediatric care and the constant tweaking of the interventions initiated to enhance quality.

#### *Implications for Practice*

Consequently, the information from this review helps chart the course of QI in pediatric health care in the future. In its wake, a notable one is the blending of real-time business intelligence and analysis with analytics, as well as applications of artificial intelligence. These technologies can also bring in a novel system of care delivery by allowing individualized management strategy, outcome prognostication, and early warning



signals regarding complications. For instance, algorithms in the realm of AI can work on a big dataset to weigh the likelihood of readmissions or adverse events, and hence, the caregivers can act before the occurrence of such an event.

Another topic should be the creation of clinical, informatics, and patient partner teams. Such teams can come together to develop and execute QI strategies that are creative and sensitive to patients' needs. As composed of different perspectives, such teams can tackle such issues and guarantee that the provision of care for children must meet those requirements from the substance of its intervention as well as from the standpoint of its sustainability (Andersen et al., 2019). Engagement of the family should be maintained as the focus of QI projects. Future improvements could build upon current approaches by adding the use of digital communication technology, which allows families to join care plans electronically. Pursuant to this, now apparent opportunities for family-centered care may include the creation of an online evaluation to serve as a virtual family advisory council so that the families can have an open platform of communication and engage with the health care providers.

Finally, increased use of value-based care could encourage the use of QI strategies by aligning payment to outcomes. This is a noble approach in practice since it promotes improved financial returns with common goals and objectives of QI by embracing innovation for improved care organization.

## Discussion

As for the QI strategies for improving the needs of pediatric health care, there is even more untapped potential. To sustain progress and deal with barriers such as staff resistance, inadequate resources, and variability in the care of children, the organizing model places much emphasis on certain challenges. In the context of these barriers, barriers that have the potential to hamper the advancement of pediatric care, all healthcare providers need to embrace technological advancement, promote multidisciplinary collaboration, and acknowledge the important role of families in child-centered care (Frost et al., 2017)..

*Figure 3 summarizes QI strategies and outcomes, suggesting how different aspects of safety, chronic diseases, and families are related and work together to improve pediatric healthcare.*



*After the success attained in QI initiatives, the principles of innovation, inclusion, and investment can help pediatric healthcare systems improve their delivery of appropriate, safe, efficient, and responsive care to children and families (Srivastava et al., 2015).*

## Conclusion

This review adds further credence to the critical role of QI interventions in the improvement of care to the pediatric population. Improvement strategies like techniques like Lean, Six Sigma, and family-centered care have paid off in increasing safer patient care, better chronic illness, and consumer satisfaction. Actual examples show that measures such as the implementation of EHR, telemedicine, and FAW decrease the error rate, increase compliance with the prescribed therapy, and improve the trust between patients and clinicians. This is especially important in pediatric treatment; there are always variables in development, and the child's family must be involved in treatment. The last cultural aspect also reveals that technology plays a critical role in improving productivity and personalization of patients' care.

However, several barriers continue to slow the implementation of QI strategies even after these achievements, including lack of resources, staff resistance, and differences in patient needs. Tackling these problems calls for a multispectral approach that involves policymakers, healthcare professionals, and research scientists. The main challenges are likely to include inadequate funding for staff training, unequal distribution of available resources, and the adoption of relatively new technologies like artificial intelligence in delivering learner-centered education (Beal et al., 2018). On the one hand, the policymakers should ensure adequate funding and appropriate regulation for QI; on the other hand, the researchers should work more on models that are more flexible and can accommodate many populations of children. In such a way, the healthcare system can replicate the present accomplishments to attain and deliver equally high-quality care for all children.

## Recommendations

For the sustainability of QI initiatives and the growth of more effective interventions that can reach a greater number of children, QI works for pediatric healthcare stakeholders and needs policymakers and academic support (Weber et al., 2019). All three have unique but mutually related functions for solving current problems and stimulating new ideas.

### *For Healthcare Providers*

Investment in staff training is therefore recommendable as a way of addressing resistance to QI implementation amongst healthcare providers. Actual training initiatives should incorporate Lean, Six Sigma, or PDSA to teach team's effective ways for enhancing patient safety, as well as processes for enhancing organizational efficiency. There is also a need for providers to encourage interprofessional relationships by involving families in the decision-making process through family-centered care. If families are engaged in a partnership with healthcare teams, considerations of adherence, satisfaction, and results can all be enhanced.

### *For Policymakers*

Policymakers need to provide sufficient capital to ensure that the enhancement of EHRs and telemedicine solutions can be effectively implemented in children's healthcare. Funding initiatives should make a specific effort to guarantee that even developing institutions have those tools at their disposal to help balance equity and the quality of care (Haine-Schlagel & Walsh 2015). Finally, policymakers should also set up guidelines that encourage the use of QI techniques by associating their reward with the patients' outcomes.

### *For Researchers*

Scholars hold a significant responsibility to promote QI by developing peculiar approaches in interventions with a filmy aim, which is AI intercessory. AI can give better and more precise care to pediatric patients,

improving early complication identification and general decision-making tools in child treatment. Further research should then be directed toward identifying cost-effective and personalized AI solutions appropriate for pediatric patients while enhancing their compatibility with current systems of care.

## References

- Al-Azzam, M. A. R., Alrfai, M. M., Al-Hawary, S. I. S., Mohammad, A. A. S., Al-Adamat, A. M., Mohammad, L. S., Al-hourani, L. (2023). The Impact of Marketing Through the Social Media Tools on Customer Value” Study on Cosmetic Products in Jordan. In *Emerging Trends and Innovation in Business and Finance* (pp. 183-196). Singapore: Springer Nature Singapore.
- Al-E'wesat, M.S., Hunitie, M.F., Al sarayreh, A., Alserhan, A.F., Al-Ayed, S.I., Al-Tit, A.A., Mohammad. A.A., Al-hawajreh, K.M., Al-Hawary, S.I.S., Alqahtani, M.M. (2024). Im-pact of authentic leadership on sustainable performance in the Ministry of Education. In: Hannon, A., and Mahmood, A. (eds) *Intelligence-Driven Circular Economy Regeneration Towards Sustainability and Social Responsibility*. Studies in Computational Intelligence. Springer, Cham. Forthcoming.
- Al-Hawary, S. I. S., Mohammad, A. S., Al-Syasneh, M. S., Qandah, M. S. F., Alhajri, T. M. S. (2020). Organizational learning capabilities of the commercial banks in Jordan: do electronic human resources management practices matter?. *International Journal of Learning and Intellectual Capital*, 17(3), 242-266. <https://doi.org/10.1504/IJLIC.2020.109927>
- Al-Husban, D. A. A. O., Al-Adamat, A. M., Haija, A. A. A., Al Sheyab, H. M., Aldai-hani, F. M. F., Al-Hawary, S. I. S., Mohammad, A. A. S. (2023). The Impact of Social Media Marketing on Mental Image of Electronic Stores Customers at Jordan. In *Emerging Trends and Innovation in Business And Finance* (pp. 89-103). Singa-pore: Springer Nature Singapore. [https://doi.org/10.1007/978-981-99-6101-6\\_7](https://doi.org/10.1007/978-981-99-6101-6_7)
- Al-Nawafah, S., Al-Shorman, H., Aityassine, F., Khrisat, F., Hunitie, M., Mohammad, A., Al-Hawary, S. (2022). The effect of supply chain management through social media on competitiveness of the private hospitals in Jordan. *Uncertain Supply Chain Management*, 10(3), 737-746. <http://dx.doi.org/10.5267/j.uscm.2022.5.001>
- Alolayyan, M., Al-Hawary, S. L., Mohammad, A. A., Al-Nady, B. A. (2018). Banking Service Quality Provided by Commercial Banks and Customer Satisfaction: A structural Equation Modelling Approaches. *International Journal of Productivity and Quality Management*, 24(4), 543-565. <https://doi.org/10.1504/IJPQM.2018.093454>
- Al-Shorman, H., AL-Zyadat, A., Khalayleh, M., Al- Quran, A. Z., Alhalalmeh, M. I., Mohammad, A., Al-Hawary, S. (2022). Digital Service Quality and Customer Loyalty of Commercial Banks in Jordan: the Mediating Role of Corporate Image. *Information science letters*, 11(06), 1887-1896.
- Alzyoud, M., Hunitie, M.F., Alka'awneh, S.M., Samara, E.I., Bani Salameh, W.M., Abu Haija, A.A., Al-shanableh, N., Mohammad, A.A., Al-Momani, A., Al-Hawary, S.I.S. (2024). Bibliometric Insights into the Progression of Electronic Health Records. In: Hannon, A., and Mahmood, A. (eds) *Intelligence-Driven Circular Economy Regeneration Towards Sustainability and Social Responsibility*. Studies in Computational Intelligence. Springer, Cham. Forthcoming.
- Andersen, L. W., Holmberg, M. J., Berg, K. M., Donnino, M. W., & Granfeldt, A. (2019). In-hospital cardiac arrest: a review. *Jama*, 321(12), 1200-1210. <https://jamanetwork.com/journals/jama/article-abstract/2728930>
- Beal, T., Tumilowicz, A., Sutrisna, A., Izwardy, D., & Neufeld, L. M. (2018). A review of child stunting determinants in Indonesia. *Maternal & child nutrition*, 14(4), e12617. <https://onlinelibrary.wiley.com/doi/abs/10.1111/mcn.12617>
- Boffa, D. J., Rosen, J. E., Mallin, K., Loomis, A., Gay, G., Palis, B., ... & Winchester, D. P. (2017). Using the National Cancer Database for outcomes research: a review. *JAMA oncology*, 3(12), 1722-1728. <https://jamanetwork.com/journals/jamaoncology/article-abstract/2604822>
- Bonis, S. (2016). Stress and parents of children with autism: A review of literature. *Issues in mental health nursing*, 37(3), 153-163. <https://www.tandfonline.com/doi/abs/10.3109/01612840.2015.1116030>
- Doe, R. M., Casas, M., Gascon, M., Valvi, D., & Nieuwenhuijsen, M. (2016). Environmental pollutants and child health—a review of recent concerns. *International journal of hygiene and environmental health*, 219(4-5), 331-342. <https://www.sciencedirect.com/science/article/pii/S1438463916300396>
- Eldahamsheh, M.M., Almomani, H.M., Bani-Khaled, A.K., Al-Quran, A.Z., Al-Hawary, S.I.S & Mohammad, A.A (2021). Factors Affecting Digital Marketing Success in Jordan . *International Journal of Entrepreneurship* , 25(S5), 1-12.
- Frost, B. L., Modi, B. P., Jaksic, T., & Caplan, M. S. (2017). New medical and surgical insights into neonatal necrotizing enterocolitis: a review. *JAMA pediatrics*, 171(1), 83-88. <https://jamanetwork.com/journals/jamapediatrics/article-abstract/2587683>
- Gulia, S., Nagendra, S. S., Khare, M., & Khanna, I. (2015). Urban air quality management-A review. *Atmospheric Pollution Research*, 6(2), 286-304. <https://www.sciencedirect.com/science/article/pii/S1309104215302373>
- Haine-Schlagel, R., & Walsh, N. E. (2015). A review of parent participation engagement in child and family mental health treatment. *Clinical child and family psychology review*, 18, 133-150. <https://link.springer.com/article/10.1007/s10567-015-0182-x>
- Howard, L. M., & Khalifeh, H. (2020). Perinatal mental health: a review of progress and challenges. *World Psychiatry*, 19(3), 313-327. <https://onlinelibrary.wiley.com/doi/abs/10.1002/wps.20769>
- Jobst, B. C., & Cascino, G. D. (2015). Resective epilepsy surgery for drug-resistant focal epilepsy: a review. *Jama*, 313(3), 285-293. <https://jamanetwork.com/journals/jama/article-abstract/2091309>
- Jones, L. H., Kabir, E., & Kabir, S. (2015). A review on the human health impact of airborne particulate matter. *Environment international*, 74, 136-143. <https://www.sciencedirect.com/science/article/pii/S0160412014002992>

- Lewis, C. C., Boyd, M., Puspitasari, A., Navarro, E., Howard, J., Kassab, H., ... & Kroenke, K. (2019). Implementing measurement-based care in behavioral health: a review. *JAMA psychiatry*, 76(3), 324-335. <https://jamanetwork.com/journals/jamapsychiatry/article-abstract/2718629>
- McLean, S. F. (2016). Case-based learning and its application in medical and health-care fields: a review of worldwide literature. *Journal of medical education and curricular development*, 3, JMECD-S20377. <https://journals.sagepub.com/doi/abs/10.4137/JMECD.S20377>
- Mohammad, A. A. S., Alolayyan, M. N., Al-Daoud, K. I., Al Nammias, Y. M., Vasudevan, A., & Mohammad, S. I. (2024a). Association between Social Demographic Factors and Health Literacy in Jordan. *Journal of Ecohumanism*, 3(7), 2351-2365.
- Mohammad, A. A. S., Al-Qasem, M. M., Khodeer, S. M. D. T., Aldaihani, F. M. F., Alserhan, A. F., Hajja, A. A. A., ... & Al-Hawary, S. I. S. (2023b). Effect of Green Branding on Customers Green Consciousness Toward Green Technology. In *Emerging Trends and Innovation in Business and Finance* (pp. 35-48). Singapore: Springer Nature Singapore. [https://doi.org/10.1007/978-981-99-6101-6\\_3](https://doi.org/10.1007/978-981-99-6101-6_3)
- Mohammad, A. A. S., Barghouth, M. Y., Al-Husban, N. A., Aldaihani, F. M. F., Al-Husban, D. A. A. O., Lemoun, A. A. A., ... & Al-Hawary, S. I. S. (2023a). Does Social Media Marketing Affect Marketing Performance. In *Emerging Trends and Innovation in Business and Finance* (pp. 21-34). Singapore: Springer Nature Singapore. [https://doi.org/10.1007/978-981-99-6101-6\\_2](https://doi.org/10.1007/978-981-99-6101-6_2)
- Mohammad, A. A. S., Khanfar, I. A., Al Oraini, B., Vasudevan, A., Mohammad, S. I., & Fei, Z. (2024b). Predictive analytics on artificial intelligence in supply chain optimization. *Data and Metadata*, 3, 395-395.
- Mohammad, A., Aldmour, R., Al-Hawary, S. (2022). Drivers of online food delivery orientation. *International Journal of Data and Network Science*, 6(4), 1619-1624. <http://dx.doi.org/10.5267/j.ijdns.2022.4.016>
- Park, M., Lee, M., Jeong, H., Jeong, M., & Go, Y. (2018). Patient-and family-centered care interventions for improving the quality of health care: A review of systematic reviews. *International journal of nursing studies*, 87, 69-83. <https://www.sciencedirect.com/science/article/pii/S0020748918301706>
- Rahamneh, A., Alrawashdeh, S., Bawaneh, A., Alatyat, Z., Mohammad, A., Al-Hawary, S. (2023). The effect of digital supply chain on lean manufacturing: A structural equation modelling approach. *Uncertain Supply Chain Management*, 11(1), 391-402. <http://dx.doi.org/10.5267/j.uscm.2022.9.003>
- Sicherer, S. H., & Sampson, H. A. (2018). Food allergy: a review and update on epidemiology, pathogenesis, diagnosis, prevention, and management. *Journal of Allergy and Clinical Immunology*, 141(1), 41-58. <https://www.sciencedirect.com/science/article/pii/S0091674917317943>
- Smith, H., Ameh, C., Roos, N., Mathai, M., & Broek, N. V. D. (2017). Implementing maternal death surveillance and response: a review of lessons from country case studies. *BMC Pregnancy and Childbirth*, 17, 1-11. <https://link.springer.com/article/10.1186/s12884-017-1405-6>
- Smith, J., Schmidt, S. A. J., Sandegaard, J. L., Ehrenstein, V., Pedersen, L., & Sorensen, H. T. (2015). The Danish National Patient Registry: a review of content, data quality, and research potential. *Clinical epidemiology*, 449-490. <https://www.tandfonline.com/doi/abs/10.2147/CLEP.S91125>
- Sorenson, C., Bolick, B., Wright, K., & Hamilton, R. (2016). Understanding compassion fatigue in healthcare providers: A review of current literature. *Journal of Nursing Scholarship*, 48(5), 456-465. <https://sigmapubs.onlinelibrary.wiley.com/doi/abs/10.1111/jnu.12229>
- Srivastava, A., Avan, B. I., Rajbangshi, P., & Bhattacharyya, S. (2015). Determinants of women's satisfaction with maternal health care: a review of literature from developing countries. *BMC pregnancy and childbirth*, 15, 1-12. <https://link.springer.com/article/10.1186/s12884-015-0525-0>
- Weber, L., Kamp-Becker, I., Christiansen, H., & Mingeback, T. (2019). Treatment of child externalizing behavior problems: a comprehensive review and meta-analysis on effects of parent-based interventions on parental characteristics. *European Child & Adolescent Psychiatry*, 28(8), 1025-1036. <https://link.springer.com/article/10.1007/s00787-018-1175-3>
- Wong, C., Odom, S. L., Hume, K. A., Cox, A. W., Fettig, A., Kucharczyk, S., ... & Schultz, T. R. (2015). Evidence-based practices for children, youth, and young adults with autism spectrum disorder: A comprehensive review. *Journal of autism and developmental disorders*, 45, 1951-1966. <https://link.springer.com/article/10.1007/s10803-014-2351-z>