

## Abstract

### Abstract

Diabetes infections are a silent healthcare crisis. Diabetes infections and diabetes infection-related mortalities are on the rise. Infections in diabetes are expensive to manage, often leading to high mortality rates. Studies show that diabetes has the highest infection-related mortalities (about 12%) despite effective strategies to address these conditions (Zoppini et al., 2018). Diabetes complications are also expensive to treat, and their management is complicated by infections. Strategies laid by the government such as annual and biannual follow-up visits and recommended vaccinations such as influenza and pneumococcal vaccines are hardly emphasized, thus the high infection and infection-related mortalities in diabetes. Community education is vital to provoke health behavior and increase knowledge of resources availability, access, and utilization using the DMAIC quality improvement model to address this problem. The DMAIC model is an effective strategy for promoting the QI. The model can be used in all stages, from planning to evaluation. It will ensure the change strategy is tested before implementation, thus enhancing its success. The DMAIC model will inform the QI project's planning, implementation, and evaluation.

[NURSINGLANCE.COM](http://NURSINGLANCE.COM)



# Quality Improvement Presentation Poster

Student's Name  
Institutional Affiliation  
Course Name/Code  
Due Date

## The DMAIC Six Sigma Quality Improvement Method

- Quality improvement is a formal process that analyzes practice performance and aims at improving performance. Quality improvement thus requires an understanding of the existing structures to inform their evaluation and change. The Six Sigma DMAIC QI model is an essential model for the QI project (Kollipara et al., 2021).
- The first step is to Define which identifies current frameworks and create the problem statement/ identifying the problem. This step identifies the problem, population, and expected outcomes. The underlying problem is increased diabetes infections and infection-related mortalities in diabetes, and the expected result is decreased diabetes-related infections and mortality, which are relatively high (Kim et al., 2019). The target population is the community, and the project is within the scope of nursing practice.
- The second step, Measure, entails collecting and analyzing data on the current state/ quantifying the problem. It also entails determining the data collection methods. Data collection methods will be based on identified outcomes such as change in therapeutic outcomes, self-efficacy, and increased follow-up visits for this quality improvement method. Current data shows that diabetes accounts for more than 6% of all infections and about 12% of infection-related mortalities. The data collected will inform the subsequent processes (Carey et al., 2019).
- The third step, Analyze, entails determining the root causes and developing the implementation plan and improvement plan controls. The primary causes of high infection rates are weak immunity and poor glycemic control (Carey et al., 2018). Other factors include low follow-up and poor vaccination rates due to the lack of emphasis on their importance.
- The fourth step, improve, entails changes to care delivery processes. It is the implementation and verification stage of the problem. The chosen intervention is comprehensive community education to the community on the diabetes infection crisis and the importance of adherence to follow-up, self-care, and vaccinations (Kollipara et al., 2021).
- The last step, Control, entails follow-up to ensure the planned change is implemented. Controlling will entail active monitoring and evaluation to ensure the project's success (Ghisi et al., 2021).



## Benefits to the Interprofessional Team

- The project framework will help assign relevant roles to the interprofessional teams promoting efficiency and job satisfaction hence better collaboration (Kollipara et al., 2021).
- The project will also bring together professionals from many healthcare sectors, therefore holistic approaches to designing and implementing education in communities.

## Overall Project Benefits

- The project will educate individuals and increase their knowledge in self-care, available resources and will thus reduce diabetes infections, improving the quality of life of diabetic patients (Kim et al., 2019)
- The DMAIC model will help identify flaws in the process and correct them, leading to quality health outcomes. The model offers a chronological way of performing tasks, hence improved interprofessional participation and collaboration leading to high-quality health outcomes (Veres, 2020)
- Institutions will benefit by reducing the burden of diabetic-related infections that are often expensive and difficult to manage.
- Better health outcomes lead to improved patient satisfaction, better healthcare institutions' reputations, and improved morale of healthcare workers (Saisho, 2018)

## Limitations of the DMAIC strategy

- The DMAIC process is too complex and cumbersome for simple and obvious problems, which wastes time and resources in the resource-scarce environment (Veres, 2020).
- The process is too complex, and institutions may focus more on following the model than on producing quality outpatients leading to failure. It is thus not guaranteed that using the process will lead to better performance (Kollipara et al., 2021).
- The DMAIC process uses an all-in-one approach to solve all institutions' quality improvement problems. Owing to the new and arising needs, the model may be limited in its application in healthcare (Veres, 2020)

## Evidence Supporting DMAIC

- Healthcare needs are dynamic, and healthcare resources are scarce. There is thus the need to ensure their optimal use. The DMAIC process provides a framework that evaluates processes and unearths problems that are not obvious hence saving on costs and improving care delivery processes (Ponsiglione et al., 2021)
- According to Arafteh et al. (2018), the DMAIC model is not limited to practice and can be applied to other processes such as education and developing new strategies and projects to improve healthcare.
- The process utilizes all interprofessional team members, promoting collaboration in all its implementation processes (Kollipara et al., 2020). According to Veres (2020), the DMAIC model improves healthcare efficiency and promotes better workplace environments.

## Knowledge Gaps and Unknowns

- The model may be ineffective when assessing processes with limited data availability.
- The model utilizes data and may predict errors in processes, but the credibility of the data produced may negatively affect the project's outcome (Veres, 2020).
- The process requires a set of objectives, and if these objectives do not align with the problem or the existing process's objectives and goals, the results and abstractions may be incorrect
- The DMAIC model is of non-medical origin, and there lacks explicit instruction on which processes can and which cannot use DMAIC for improvement (Kollipara et al., 2021). The judgment of left to the researcher, and when it is poor, the results may not be representative or false.

## Change Strategy Foundation

- Diabetes infections are notorious due to low immunity and high blood sugar levels. Individuals with diabetes are thus more exposed to diabetes infections and more severe infections with chronic and acute diseases such as upper respiratory infections, hypertension, acute renal injury, and COVID-19.
- Current frameworks such as pneumococcal and influenza vaccines for diabetes patients and follow-up visits recommended by healthcare regulatory agencies are not followed. According to Km et al. (2019), awareness of infection crisis and simple self-management protective strategies can increase individual awareness and thus reduce the prevalence and rates of infections in diabetes.
- Ernawati et al. (2021) and Ghisi et al. (2021) show that patient education is a cornerstone in promoting self-care behavior among diabetic patients and better patient outcomes.

## Potential Challenges

- A potential challenge is the availability of funds for the program because it requires resources for planning, implementation, and evaluation. Lack of support from the federal and state government makes it hard to manage the resource-intensive community-based projects (Aley et al., 2022).

## References

Aley, L., Nellis, B., Uelmen, J., & Hicks, A. (2022). Lessons Learned from a Sustainability-Focused, Community-Based Learning: Green Food Partnership. *Sustainable Food Systems: A Review*, 1(1), 17-31. <https://doi.org/10.1002/sfs.1001>

Arafteh, M., Barghash, M. A., Haddad, N., Musharbash, N., Nashawati, D., Al-Bashir, A., & Assaf, F. (2018). Using six sigma DMAIC methodology and discrete event simulation to reduce patient discharge time in king Hussein cancer center. *Journal of healthcare engineering*, 2018. <https://doi.org/10.1155/2018/28372131>

Carey, I. M., Critchley, J. A., DeWilde, S., Harris, T., Hosking, F. J., & Cook, D. G. (2018). Risk of infection in type 1 and type 2 diabetes compared with the general population: a matched cohort study. *Diabetes care*, 41(1), 513-521. <https://doi.org/10.2337/dk17-2131>

Ernawati, U., Wilasari, T. A., & Dhani, Y. W. (2021). Effectiveness of diabetes self-management education (DSME) in type 2 diabetes mellitus (T2DM) patients: Systematic literature review. *Journal of Public Health Research*, 10(2). <https://doi.org/10.4081/jphr.2021.2240>

Ghisi, G. L. D. M., Seixas, M. B., Pereira, D. S., Cisneros, L. L., Ezequiel, D. G. A., Aultman, C., Sandison, N., Oh, P., & da Silva, L. P. (2021). Patient education program for Brazilians living with diabetes and prediabetes: findings from a development study. *BMC public health*, 21(1), 1-16. <https://doi.org/10.1186/s12889-021-11300-y>

Kim, E. J., Hu, K. H., Kim, D. J., & Choi, Y. H. (2019). Diabetes and the risk of infection: a national cohort study. *Diabetes & metabolism journal*, 43(6), 804-814. <https://doi.org/10.1007/s00125-019-04701>

Kollipara, U., Rivera-Bermuy, M., Putra, J., Burks, J., Meyer, A., Ferguson, S., Nelson, C., Mutz, J., Mirfakhraee, S., Bajaj, P., Kermani, A., Fish, J. S., & Ali, S. (2021). Improving Diabetes Control Using Lean Six Sigma Quality Improvement in an Endocrine Clinic in a Large Accountable Care Organization. *Clinical Diabetes*, 39(1), 57-63. <https://doi.org/10.2337/diabetes.2020.01034>

Ponsiglione, A. M., Ricciardi, C., Scala, A., Fiorillo, A., Sorrentino, A., Triassi, M., Orabona, G. D., & Improta, G. (2021). Application of DMAIC cycle and modeling as tools for health technology assessment in a university hospital. *Journal of healthcare engineering*, 2021. <https://doi.org/10.1155/2021/34590948>

Saisho, Y. (2018). Use of diabetes treatment satisfaction questionnaire in diabetes care: importance of patient-reported outcomes. *International journal of environmental research and public health*, 15(5), 947. <https://doi.org/10.3390/ijerph15050947>

Veres, C. (2020). Conceptual model for introducing lean management instruments. *Procedia Manufacturing*, 46, 233-237. <https://doi.org/10.1016/j.promfg.2020.03.034>

Zoppietti, G., Fedeli, U., Schiavano, E., Dauriz, M., Tarpher, G., Bonora, E., & Corti, M. C. (2018). Mortality from infectious diseases in diabetes. *Nutrition, Metabolism and Cardiovascular Diseases*, 28(5), 444-450. <https://doi.org/10.1016/j.numecd.2017.12.007>

NURSING