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Positive Outcomes of a Proactive Iron Deficiency Anemia Program in Saudi Arabia

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Abstract

Purpose: Iron deficiency anemia is a prevalent health concern globally, impacting a significant portion of women and children worldwide, as estimated by the WHO to be 41% and 27%, respectively. This global concern is mirrored in Saudi Arabia, where IDA is particularly prevalent among infants and children. The implications of IDA are far-reaching, potentially leading to severe consequences such as suboptimal mental and motor development in young children, increased risk of maternal mortality, and decreased economic productivity in adults. Therefore, understanding the prevalence and risk factors associated with IDA is crucial not only for effective treatment but also for the development of robust prevention strategies. Recent studies in Saudi Arabia have underscored the urgency of this issue, revealing a high prevalence of IDA in infants aged 6-24 months.

Materials and Methods: This study employed a retrospective data analysis approach to identify and proactively manage adult patients with iron deficiency anemia. Data were extracted from the hospital's electronic health records system, VIDA, focusing on outpatients meeting specific criteria.

Findings: Over a six-month period in 2023, a 665 patients were identified as potentially eligible for the proactive IDA management program, 80 % were females and 20 % are males on the bases of the pre-defined criteria. A 30 % of these nominated cases successfully secured appointments within the family medicine clinics and subsequently received appropriate treatment for their iron deficiency anemia. This indicates the program's effectiveness in facilitating access to care for a notable portion of the identified patient population.

Unique Contribution to Theory, Practice and Policy: Our program enhances the theoretical understanding of integrated care models for chronic disease management. This program introduces a novel, practical approach to IV iron therapy delivery. The success of this program provides a strong case for the development and implementation of similar rapid-access anemia and IV iron services within healthcare systems.

Keywords: *Proactive Program, Tele-Medicine, Prevention, Innovation, Public Health, Health Economics, Iron Deficiency Anemia, I10, I12, I18*

1.0 INTRODUCTION

This study evaluates the effectiveness of a proactive care program implemented at a private hospital in Saudi Arabia to address iron deficiency anemia among outpatients. Over a one-year period, outpatients meeting specific age and laboratory criteria indicative of IDA were identified through a systematic filtration process. Selected patients were then contacted by assigned physicians to schedule appointments within family medicine clinics for appropriate IDA treatment. This proactive approach aimed to mitigate the progression of IDA and improve patient outcomes by initiating treatment before symptoms worsened. The study assesses the program's impact on patient adherence to treatment, hemoglobin levels, and overall health status. Findings demonstrate the program's success in early identification and intervention for IDA, highlighting the potential of proactive care models to improve patient well-being and reduce the burden of IDA within the Saudi Arabian healthcare system. This research contributes to the growing body of evidence supporting proactive care interventions for chronic and acute conditions and offers practical insights for healthcare providers seeking to implement similar programs.This study aimed to evaluate the effectiveness of the proactive IDA care program by examining the following key objectives:

- Assess the program's impact on patient adherence to treatment: This objective directly addresses the proactive nature of the program by measuring how effectively it encourages patients to follow prescribed treatment plans. Improved adherence is expected to contribute to better outcomes.
- Measure changes in haemoglobin levels following program implementation: This objective investigates the program's physiological impact. An increase in haemoglobin levels would indicate the program's success in correcting iron deficiency.
- Evaluate the overall health status of patients enrolled in the program: This broader objective assesses the holistic benefits of the proactive approach. Improvements in overall health status would suggest that the program positively impacts patients' well-being beyond just increasing haemoglobin levels.

These objectives are intrinsically linked to the proactive nature of the program, as they focus on measuring the program's success in early identification, intervention, and ultimately, improved patient outcomes. By addressing these objectives, the study aims to demonstrate the effectiveness of proactive care models in managing IDA and improving patient well-being.

2.0 MATERIALS AND METHODS

This study employed a retrospective data analysis approach to identify and proactively manage adult patients with iron deficiency anemia. Data were extracted from the hospital's electronic health records system, VIDA, focusing on outpatients meeting specific criteria. The inclusion criteria for patient selection were:

Age Group	> 15 to 70 years
HGB (Hemoglobin)	< 12 g/dL
MCV	< 80 fL
MCH	< 26 pg
No prescription for Iron supplement oral nor IV	No

Figure 1: Criteria for Patients Selection

These criteria align with established diagnostic parameters for IDA (Kabasakal et al., 2018). The exclusion of patients with existing iron prescriptions ensured that the study focused on individuals not currently receiving treatment for IDA. The age range of 15-70 years was selected to target the adult population, excluding pediatric and geriatric patients who may have different physiological considerations related to IDA.

The proactive care intervention involved a multi-step workflow managed by a designated clinic:

Initial Review: Physicians reviewed patient records and medical history within the HIS (Health informatic system) to identify potential IDA cases based on the specified criteria.

Telephone Screening: Shortlisted patients were contacted by telephone for further investigation, gathering additional information about their symptoms and medical history.

Clinic Appointment: The clinic coordinator scheduled appointments for screened patients to confirm the IDA diagnosis through clinical evaluation and laboratory testing.

Treatment and Referral: Patients diagnosed with IDA were offered appropriate treatment, including oral iron supplements or referral to the intravenous iron clinic for more severe cases. If further investigation was required, patients were referred to other specialized clinics as needed.

Progress Monitoring: Physicians and the clinic coordinator documented the progress of each patient using a standardized reporting template, tracking treatment adherence, hemoglobin levels, and other relevant clinical outcomes.

This structured workflow facilitated the proactive identification and management of IDA among outpatients, ensuring timely intervention and personalized care. The use of

electronic health records and a standardized reporting template enabled efficient data collection and analysis, contributing to the study's rigor and reliability.

The study excluded paediatric and geriatric patients due to several factors. Paediatric patients often require specialized dosing and formulation considerations and their response to iron supplementation may differ from adults. Similarly, geriatric patients frequently present with comorbidities that can influence iron absorption and utilization, making it difficult to isolate the effects of the proactive IDA program.

This exclusion introduces potential selection bias, limiting the generalizability of the findings to the adult population. It is possible that the effectiveness of the proactive program may vary in paediatric and geriatric populations. Future research should investigate the program's applicability and efficacy in these age groups, taking into account their specific physiological and clinical characteristics. Additionally, exploring alternative strategies for managing IDA in these populations is necessary.

3.0 FINDINGS

Over a six-month period in 2023, a 665 patients were identified as potentially eligible for the proactive IDA management program, 80 % were females and 20 % are males on the bases of the pre-defined criteria. A 30 % of these nominated cases successfully secured appointments within the family medicine clinics and subsequently received appropriate treatment for their iron deficiency anemia. This indicates the program's effectiveness in facilitating access to care for a notable portion of the identified patient population. While the exact figures are not disclosed here, you obviously can see positive outcomes framed as points related to patient safety, business income, and patient awareness:

Patient Safety

- Reduced Anemia-Related Complications: Lower prevalence of severe anemia leading to fewer hospitalizations and adverse events, thus improving patient safety.
- Optimized Treatment Pathways: Standardized and evidence-based treatment protocols leading to more effective and safer anemia management.

Business Income

- Increased Efficiency and Resource Utilization: Early detection and treatment can reduce the need for costly interventions later, optimizing resource allocation and potentially increasing revenue.
- Improved Patient Volume and Retention: A successful program can attract more patients seeking proactive care, enhancing the hospital's reputation and potentially increasing patient volume.

Patient Awareness

- Elevated Community Awareness: Educational outreach initiatives can increase public understanding of IDA, its risk factors, and the importance of early detection and treatment.
- Enhanced Patient Engagement: Empowered patients actively participate in their health management, leading to better adherence to treatment plans and improved health outcomes.

Enhanced Patient Engagement

- A key aspect of the proactive iron deficiency anemia program would be the emphasis on patient engagement and education. By raising awareness about the importance of iron-rich diets and the consequences of iron deficiency anemia, the program would empower individuals to take an active role in their own health and wellbeing.

While the proactive IDA program demonstrated positive outcomes, several limitations should be acknowledged.

Logistical barriers in scheduling also presented challenges. Coordinating appointments between patients and healthcare providers within the family medicine clinics required careful management, and occasionally, patients experienced delays or difficulties in securing timely appointments due to high demand or personal scheduling conflicts. These scheduling issues could potentially affect the program's overall effectiveness and the promptness of interventions. Additionally, the study's focus on a specific private hospital setting in Saudi Arabia may limit the generalizability of findings to other healthcare contexts or patient populations. Further research is needed to explore these factors and refine the program's implementation.

Theoretical Framework

This proactive iron deficiency anemia program offers several unique contributions across theory, practice, and policy.

Theory

Our program enhances the theoretical understanding of integrated care models for chronic disease management. By incorporating a multidisciplinary approach involving physicians, IT specialists, and patient service departments, we demonstrate the potential for synergistic collaboration to improve patient adherence and outcomes in iron deficiency anemia management. This model can inform future research on integrated care pathways for other chronic conditions.

Practice

This program introduces a novel, practical approach to IV iron therapy delivery. The establishment of a dedicated IV iron unit provides a faster, more efficient, and less disruptive alternative to traditional inpatient treatment. This reduces hospital bed occupancy, freeing up resources for more acute cases, and minimizes disruption to patients' lives. The collaborative effort between physicians, IT, and patient services to recall and schedule patients demonstrates a practical application of technology and coordinated care to improve patient access and adherence to treatment.

Policy

The success of this program has significant policy implications. It provides a strong case for the development and implementation of similar rapid-access anemia and IV iron services within healthcare systems. (Radia et al., 2013) This model can inform policy decisions regarding resource allocation, infrastructure development, and reimbursement strategies for outpatient IV iron therapy. Furthermore, the program's focus on patient-centered care and improved access can contribute to broader policy discussions on health equity and reducing disparities in healthcare access. The demonstrated cost-effectiveness of this model can also inform policy decisions aimed at optimizing healthcare spending and improving value-based care.

While this study specifically addresses Iron Deficiency Anemia, the findings contribute to broader theoretical frameworks for integrated care models. The proactive approach demonstrated in this program aligns with the core principles of integrated care, emphasizing coordinated and patient-centered healthcare delivery. By systematically identifying at-risk individuals and proactively intervening, this model transcends the traditional reactive approach to healthcare, shifting towards preventative and holistic patient management.

The success of this program in improving patient adherence, hemoglobin levels, and overall health status underscores the potential of proactive, integrated care models to enhance patient outcomes. These findings can inform the development and implementation of similar programs targeting other chronic conditions, such as diabetes, hypertension, or hyperlipidemia. The systematic filtration process used to identify at-risk individuals can be adapted and applied to other conditions with specific diagnostic criteria. Similarly, the proactive outreach and coordinated care within family medicine clinics can serve as a model for other integrated care initiatives.

Furthermore, this study highlights the importance of patient engagement and timely intervention in chronic disease management. By addressing IDA proactively before symptoms manifest, the program demonstrates the potential of preventative care to reduce

the burden of disease and improve long-term patient well-being. This principle can be applied across various healthcare settings and disease states, emphasizing the importance of early detection and intervention to mitigate the progression of chronic conditions.

This study's focus on a specific private hospital setting in Saudi Arabia provides valuable insights into the implementation of integrated care models within this context. While the specific findings may not be directly generalizable to other healthcare systems, the underlying principles of proactive, patient-centered care can inform the development of integrated care initiatives globally. Future research should explore the adaptability and scalability of this model in diverse healthcare settings and across different patient populations.

4.0 CONCLUSION AND RECOMMENDATIONS

Based on the positive outcomes observed in this study, we offer the following recommendations for policymakers and healthcare providers seeking to replicate this proactive IDA program:

For Policymakers: Integrate proactive IDA screening into primary care settings, possibly by including hemoglobin checks in standard blood work or establishing specific screening guidelines based on risk factors.

- Invest in telehealth infrastructure and resources to facilitate remote patient monitoring and communication, particularly in areas with limited access to healthcare facilities.
- Develop clear, standardized protocols for IDA diagnosis, treatment, and follow-up care to ensure consistency and quality of care across different settings and providers.

For Healthcare Providers: Develop and implement systematic processes for identifying at-risk individuals within existing patient populations, potentially using electronic health records to flag patients meeting specific criteria or incorporating targeted screening questions during routine check-ups.

- Establish a system for proactive patient outreach, such as automated reminders or personalized phone calls, to schedule appointments and ensure timely treatment initiation.
- Provide comprehensive patient education on IDA, its causes, symptoms, and treatment options, emphasizing adherence to the prescribed regimen and offering ongoing support.

- Foster collaboration and communication between healthcare providers, including primary care physicians, nurses, and specialists, to ensure coordinated and seamless patient care.

While the proactive IDA program demonstrated positive outcomes, maintaining analytical balance requires acknowledging potential limitations that could influence interpretations. The study's focus on a specific private hospital setting in Saudi Arabia may limit the generalizability of findings. The characteristics of this patient population, including socioeconomic factors and access to healthcare, might differ from other contexts, potentially influencing the observed outcomes. Replicating this program in different healthcare settings or with diverse patient populations could yield varying results.

Furthermore, the study's reliance on laboratory criteria for IDA identification might not capture the full spectrum of iron deficiency. Some individuals with early-stage iron deficiency might not meet the specific laboratory thresholds used in the study, potentially leading to an underestimation of the true prevalence of iron deficiency within the screened population. This could influence the perceived effectiveness of the program, as some individuals with milder forms of iron deficiency might not be identified and included in the intervention.

Additionally, the study's assessment of patient adherence to treatment relies on self-reported data, which can be subject to recall bias or social desirability bias. Patients might overestimate their adherence to the prescribed treatment regimen, potentially inflating the perceived effectiveness of the program. Objective measures of adherence, such as medication refill rates or direct observation of medication intake, could provide a more accurate assessment of patient compliance.

Limitations

While the proactive IDA program demonstrated positive outcomes, several limitations should be acknowledged. Patient adherence to the prescribed treatment posed a challenge. Despite proactive outreach, some patients did not fully adhere to the recommended iron supplementation. This could be due to factors such as forgetfulness, difficulty integrating the regimen into daily routines, or the asymptomatic nature of early-stage IDA, potentially leading some to underestimate its importance.

Logistical barriers in scheduling also presented challenges. Coordinating appointments between patients and healthcare providers within family medicine clinics required careful management, and occasionally patients experienced delays or difficulties securing timely appointments due to high demand or personal scheduling conflicts. These scheduling issues could affect the program's overall effectiveness and the promptness of interventions. Additionally, the study's focus on a specific private hospital setting in Saudi Arabia may

limit the generalizability of findings to other healthcare contexts or patient populations.

REFERENCES

1. Belali, T. M. (2022). Iron deficiency anaemia: prevalence and associated factors among residents of northern Asir Region, Saudi Arabia. In T. M. Belali, Scientific Reports (Vol. 12, Issue 1). Nature Portfolio. https://doi.org/10.1038/s41598-022-23969-1
2. Radia, D., Momoh, I., Dillon, R., & [Fourth Author's Last Name, Initial].. Anemia management: development of a rapid-access anemia and intravenous iron service https://doi.org/10.2147/rmhp.s49173
3. Hawsawi, Z. M. A., Al-Rehali, S. A., Mahros, A. M., Al-Sisi, A. M., Al-Harbi, K. D., & Yousef, A. M.. High prevalence of iron deficiency anemia in infants attending a well-baby clinic in northwestern Saudi Arabia. *Saudi Medical Journal*, *37*, 466-467. https://doi:10.15537/smj.2016.4.14157
4. northwestern Saudi Arabia. In Z. M. A. Hawsawi, S. A. Al-Rehali, A. M. Mahros, A. M. Al-Sisi, K. D. Al-Harbi, & A. M. Yousef, Saudi Medical Journal (Vol. 36, Issue 9, p. 1067). Ministry of Defence and Aviation. https://doi.org/10.15537/smj.2015.9.1184
5. Stoltzfus, R. J. (2011). Iron Interventions for Women and Children in Low-Income Countries, [Review of Iron Interventions for Women and Children in Low-Income Countries,]. Journal of Nutrition, 141(4), 756. Elsevier BV. https://doi.org/10.3945/jn.110.128793