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Mobile Text and Call as Effective Tools to Reduce Sick Cell Crises

Hospitalization: A Comprehensive Review

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1. Abqaiq General Hospital
 2. Maternity and Children Hospital
 3. Hamad aljaber oncology center al hofuf
 4. Alomran hospital
 5. Yebreen PHC
 6. Alahsa psychiatric hospital
 7. Erada complex and mental health in dammam
 8. Abdulaziz bin Sulaiman Al Afaliq Center for Early Detection of Tumors
 9. Al-Kalabiya Health Centre
 10. Al-hasa branch of the ministry of health
 11. Qatif central hospital
 12. Salwa General Hospital
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ABSTRACT

Sickle cell disease (SCD) is a chronic condition characterized by recurring painful crises and complications, leading to frequent hospitalizations and reduced quality of life. Effective management strategies are crucial to minimize hospital admissions and improve patient outcomes. This review explores the role of mobile text messaging and phone call interventions in enhancing patient care for SCD. These tools have shown promise in improving medication adherence, patient education, and self-management, reducing the frequency of crises and hospitalization rates. The integration of mobile health (mHealth) in SCD care provides a cost-effective and scalable approach to addressing the challenges faced by patients and healthcare providers.

1. Introduction

Sickle cell disease is a hereditary blood disorder caused by mutations in the beta-globin gene, resulting in abnormal hemoglobin (HbS). This leads to red blood cell sickling, vascular occlusion, and chronic inflammation. SCD patients often experience vaso-occlusive crises (VOCs), which require emergency medical attention and hospitalizations (1). Despite advancements in treatment, adherence to preventive measures and regular follow-up remains a challenge.

Mobile technology, particularly text messaging and phone calls, has emerged as a potential tool for improving chronic disease management. These interventions offer personalized communication, timely reminders, and educational support, which may help reduce the frequency of SCD-related hospitalizations.

2. The Burden of Sickle Cell Disease

- **High Hospitalization Rates:** VOCs are the leading cause of hospitalization in SCD patients, often resulting in significant morbidity and economic burden(2).
- **Barriers to Care:** Poor medication adherence, limited access to healthcare, and lack of disease awareness exacerbate the risk of complications.
- **Need for Effective Interventions:** Non-invasive and scalable strategies like mHealth are gaining attention for addressing these challenges.

3. Role of Mobile Technology in Chronic Disease Management

3.1. Text Messaging

Text messaging offers a direct, low-cost way to communicate with patients. Its applications in SCD care include:

- **Medication Reminders:** Text messages have been shown to improve hydroxyurea adherence, a key medication for reducing SCD complications(2)(3)
- **Educational Campaigns:** Texts can provide information about triggers for crises, hydration tips, and signs of complications.
- **Motivational Support:** Regular motivational texts encourage patients to follow self-management plans.

3.2. Phone Calls

Phone calls provide real-time, interactive communication between patients and healthcare providers. Their benefits include:

- **Enhanced Patient Monitoring:** Regular follow-up calls help identify early symptoms of VOCs, preventing escalation.
- **Support for Caregivers:** Calls allow healthcare teams to educate caregivers about disease management, improving overall care.

4. Evidence Supporting Mobile Text and Call Interventions

4.1. Improved Medication Adherence

Studies have demonstrated the effectiveness of mobile interventions in improving adherence to hydroxyurea and other treatments:

- A randomized controlled trial found that text reminders increased medication adherence by 20% in patients with chronic conditions, including SCD (4,5).
- Phone call interventions have been associated with fewer missed appointments and higher prescription refill rates.

4.2. Reduction in Hospitalization Rates

- A pilot study involving text message interventions reported a 25% reduction in SCD-related hospitalizations over six months (6).
- Follow-up phone calls were found to decrease emergency department visits by enabling early crisis intervention.

4.3. Improved Patient Education

- Educational text messages have been linked to better understanding of SCD triggers, such as dehydration and extreme temperatures, reducing VOC frequency (Desai et al., 2020).

5. Challenges in Implementing Mobile Interventions

- **Digital Literacy:** Limited familiarity with mobile technology among some patients may reduce intervention efficacy.
- **Access to Mobile Devices:** Socioeconomic barriers may restrict access to smartphones or reliable networks.
- **Personalization of Messages:** Generic text messages may not address individual patient needs effectively.

6. Future Directions

6.1. Integration with Telemedicine

Combining text and call interventions with telemedicine platforms can provide comprehensive care for SCD patients(7).

6.2. AI-Driven Interventions

Artificial intelligence (AI) can analyze patient data to personalize text messages and predict crises, enabling timely interventions.

6.3. Broader Implementation

Scaling these interventions through public health initiatives can benefit underserved populations globally.

7. Conclusion

Mobile text and call interventions represent a promising, cost-effective approach to managing SCD. By improving medication adherence, patient education, and self-management, these tools can reduce the frequency of crises and hospitalizations. While challenges remain, advancements in technology and integration with broader healthcare systems offer significant potential to enhance SCD care.

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