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ORIGINAL ARTICLE

The Impact of SMS Follow-up on Treatment Outcomes and Patient Satisfaction in Trauma Patients

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Abstract

Background: Communication channels such as text messaging (SMS) effectively improve patient adherence to treatment and overall healthcare outcomes. This study investigated the impact of SMS follow-up on treatment outcomes and patient satisfaction in trauma patients discharged from the emergency department.

Methods: This randomized controlled trial included trauma patients who required treatment after discharge from the emergency department of Haft Tir Hospital in Tehran, Iran. Patients were randomly assigned to either an SMS follow-up group or a control group that received no SMS. The SMS follow-up group received text messages containing reminders about medication adherence, wound care instructions, and clinic appointment schedules.

Results: A total of 340 patients with a mean age of 33.47 ± 8.54 years were included in the study. Of these, 126 were female (37.05%) and 214 were male (62.95%). The SMS follow-up group showed significantly higher treatment adherence than the control group (P = 0.036). Additionally, the SMS group had significantly lower wound infection rates (P = 0.021) and shorter healing times (P = 0.043). Patient satisfaction was also significantly higher in the SMS group compared to the control group (P = 0.024).

Discussion: The findings of this study suggest that SMS follow-up can significantly improve treatment outcomes and patient satisfaction in trauma patients discharged from the emergency department. SMS follow-up can help to improve patient adherence to treatment, reduce wound infection rates, and accelerate healing times. Additionally, SMS follow-up can enhance patient satisfaction by providing timely reminders and support.

Keywords: SMS, trauma, emergency department, treatment adherence, patient satisfaction.

INTRODUCTION

Trauma is a leading cause of emergency department visits and hospitalizations worldwide. Despite advances in trauma care, non-adherence to discharge instructions remains a significant challenge, leading to adverse outcomes for patients and increased healthcare costs [1-3].

The impact of SMS follow-up on treatment outcomes and patient satisfaction in trauma patients is an area of growing interest, as mobile health (mHealth) interventions offer a promising avenue for enhancing patient care and engagement post-discharge. The use of SMS for follow-up can potentially improve adherence to treatment plans, provide timely support and information, and ultimately lead to better health outcomes and higher patient satisfaction. Research has shown that SMS interventions can be effective in modifying hazardous drinking behaviors in trauma patients, as demonstrated by the text message intervention, which aimed to reduce harmful drinking among patients discharged from trauma wards [4-5].

Similarly, another study found that trauma patients recognized the potential benefits of mHealth interventions designed to reduce hazardous drinking, with feedback suggesting that text messages could be effective in promoting motivation to seek care [6].

Moreover, the integration of SMS into routine practices of primary health care services has been explored, with studies indicating that SMS reminders can encourage patients to perform daily rehabilitation activities and may be well-received by patients and family members, despite some technical challenges [7].

The feasibility of using SMS as a health survey tool has also been evaluated, with findings suggesting that SMS text messaging is a reliable and practical method for collecting research data [8].

In the context of trauma care, the Transmural Trauma Care Model (TTCM) has shown effectiveness in improving patient-related outcome measures, indicating that a structured post-clinical rehabilitation approach can lead to better health-related quality of life, pain management, and functional status. The acceptability of text messaging as an aid to reduce harmful drinking behaviors has been assessed, with most participants indicating that text messages could be effective and expressing willingness to sign up for such interventions [1].

Additionally, the response rate to outcome questionnaires using mobile messaging software has been studied, revealing that age significantly affects the response rate, with younger patients more likely to engage with the technology [9].

Overall, the literature suggests that SMS follow-up can play a significant role in improving treatment outcomes and patient satisfaction in trauma patients. However, the success of such interventions depends on various factors, including the content and frequency of messages, patient readiness to change, and the integration of the intervention into existing health care practices. Further research, particularly randomized controlled trials, is needed to confirm the effectiveness of SMS follow-up interventions and to explore their long-term impact on patient outcomes and satisfaction.

METHODS

Study Design and Participants:

This study was a randomized controlled trial conducted at Haft Tir Hospital's emergency department. We included 340 trauma patients who required post-discharge treatment.

Patients needing additional referrals were excluded. The study aimed to evaluate the effectiveness of SMS follow-up on patient adherence to treatment and overall satisfaction compared to routine discharge instructions.

Randomization and Intervention:

Patients were randomly assigned to two groups: the SMS follow-up group and the routine discharge instructions group. The SMS group received personalized text messages tailored to their treatment needs, starting 48 hours post-discharge and continuing at intervals matched to their condition. Messages included medication reminders, wound care instructions, and follow-up visit prompts. The control group received standard discharge instructions and written recommendations without SMS follow-up.

Data Collection:

Data were systematically collected using a structured checklist and analyzed with SPSS v.23 software. Collected data encompassed patient demographics, injury details, treatment received, adherence to home treatment, clinic referrals, emergency department returns, other center referrals, patient outcomes, and satisfaction levels.

Scoring of Patient Adherence to Treatment:

Patient adherence to treatment was assessed using a self-reported adherence questionnaire administered during follow-up appointments. The scoring method included:

- Response Rate: Patients were asked to report how often they followed the prescribed treatment plans, medications, and care instructions. Responses were rated on a 5-point Likert scale (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Usually, 5 = Always).

- Adherence Score Calculation:

- A total adherence score was calculated by summing the scores for all relevant questions related to medications, wound care, and follow-up visits.

- Additional Measures: The frequency of clinic referrals, emergency department returns, and other care-seeking behaviors within the follow-up period were recorded to objectively assess adherence.

Scoring of Patient Satisfaction:

Patient satisfaction was evaluated using a standardized satisfaction survey that included various dimensions of care, which was administered at the time of the follow-up appointment. The scoring method comprised:

- Likert Scale Responses: Patients rated their satisfaction with aspects of care (e.g., overall experience, treatment received, information clarity) on a 5-point Likert scale (1 = Very Dissatisfied, 2 = Dissatisfied, 3 = Neutral, 4 = Satisfied, 5 = Very Satisfied).

- Overall Satisfaction Score:

- An overall satisfaction score was calculated by averaging the scores across all questions in the survey.

- Higher total scores indicated higher levels of satisfaction, with thresholds set (e.g., scores of 4 and above represented satisfactory experiences).

Statistical Analysis:

We employed descriptive statistics to summarize the data. Comparative analyses between the two groups were performed using regression analysis, t-tests, and repeated measures ANOVA. A P-value of less than 0.05 was set for statistical significance.

Ethical Considerations:

The study adhered to the Helsinki Declaration. Written informed consent was obtained from all participants for SMS follow-up, and patient confidentiality was maintained throughout the study. The research was conducted at Iran University of Medical Sciences in Tehran, Iran with the approval of the Ethics Board (IR.IUMS.REC 1395.9211592201).

RESULTS

Patient Characteristics:

The study included 340 patients with trauma, with a mean age of 33.47 ± 8.54 years. Of those, 37.05% were female and 62.95% were male. Two groups were homogenous regarding injury patterns. Traumatic injuries were categorized as 36.6% lacerations, 31.4% fractures, 26.7% soft tissue injuries, and 5.3% other cases (Table 1).

Table 1. Demographic Characteristics

Demographic Profile	Average / Frequency Percentage
Age	33.47 ± 8.54
Gender	
Female	37.05%
Male	62.95%
Marital Status	
Single	33.2%
Married	1.59%
Divorced	7.7%
Education	
Diploma	43.4%
Associate Degree	27.9%
Bachelor	19.7%
Higher	9.1%
Patient Job	
Manual Worker	31.8%
Free	26.4%
Employee	22.1%
Housewife	14.3%
Other	5.4%

Treatment Adherence:

Treatment adherence was significantly higher in the SMS group compared to the control group (P = 0.036). In the control group, 43.1% of patients had weak adherence, 38.6% had moderate, and 18.3% had good adherence. In the group receiving SMS, 24.5% had weak adherence, 39.8% had moderate, and 35.7% had good adherence (Figure 1).

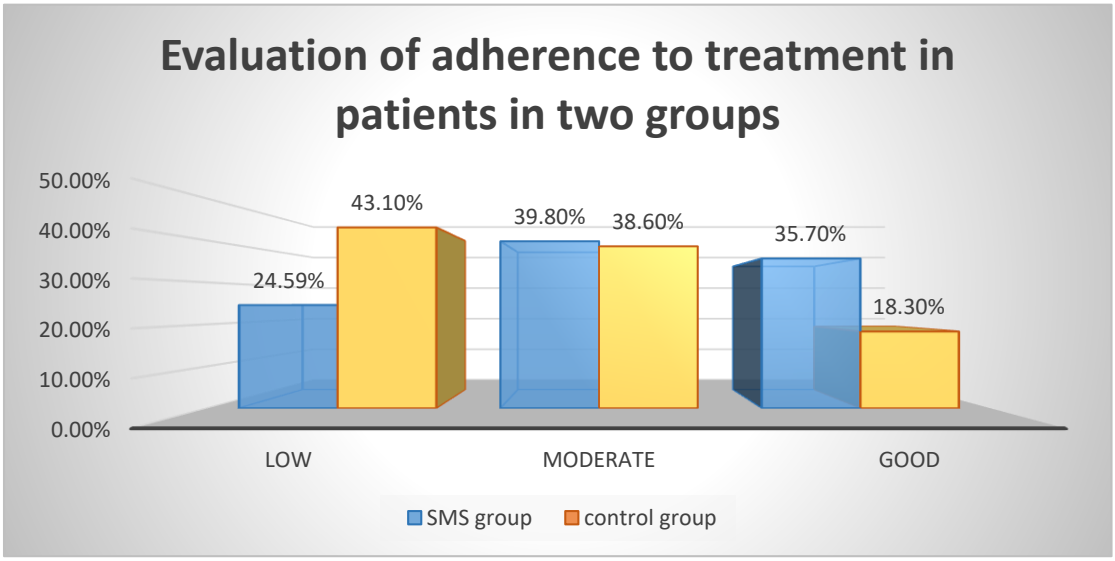

Figure 1. Evaluation of Adherence to Treatment in Patients in Two Groups

Figure 1 compares treatment adherence between the two groups, with significantly higher adherence in the SMS group.

Revisits to the Emergency Department:

Patients' return to the emergency department was significantly lower in the SMS group than in the control group (P = 0.019). In the control group, 61.4% of patients returned to the emergency room for a revisit appointment, while 38.6% did not. In the SMS group, 36.8% returned to the emergency room, while 63.2% did not (Figure 2).

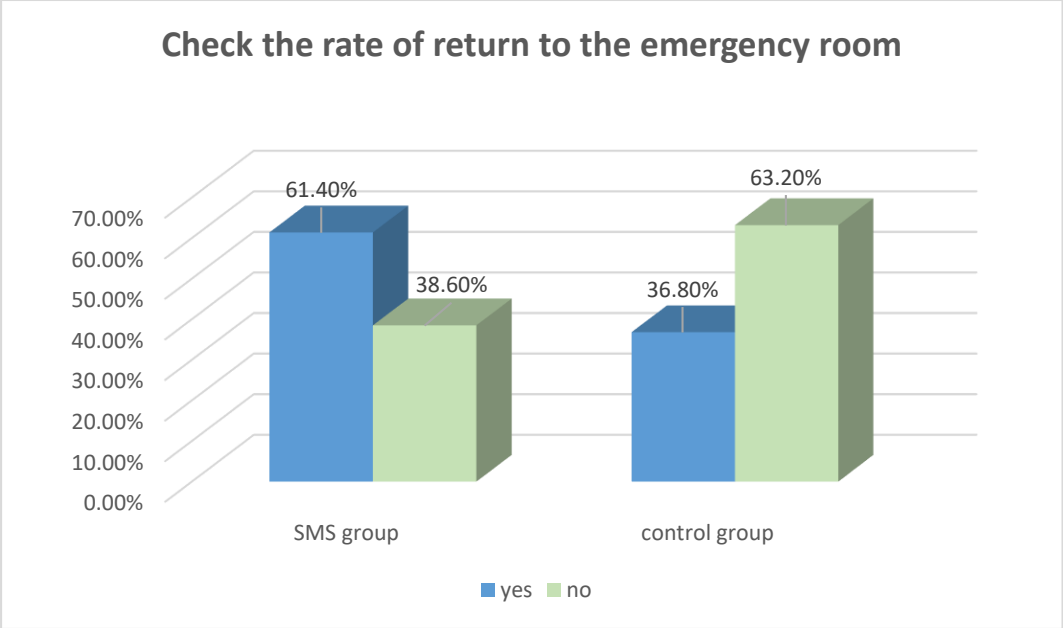

Figure 2. Check the Rate of Return to the Emergency Room

Figure 2 shows the comparison of return to the emergency room between the two groups, with significantly lower rates in the SMS group.

Referral to the Clinic:

Regarding clinic referrals, all the patients were referred to the physician to complete the treatment process in the group receiving SMS were significantly more than the control group (P = 0.031). In the control group, 42.3% of patients went to the clinic for further treatment, while 57.7% did not. In the SMS group, however, 68.9% went to the clinic, while 31.1% did not. (Figure 3).

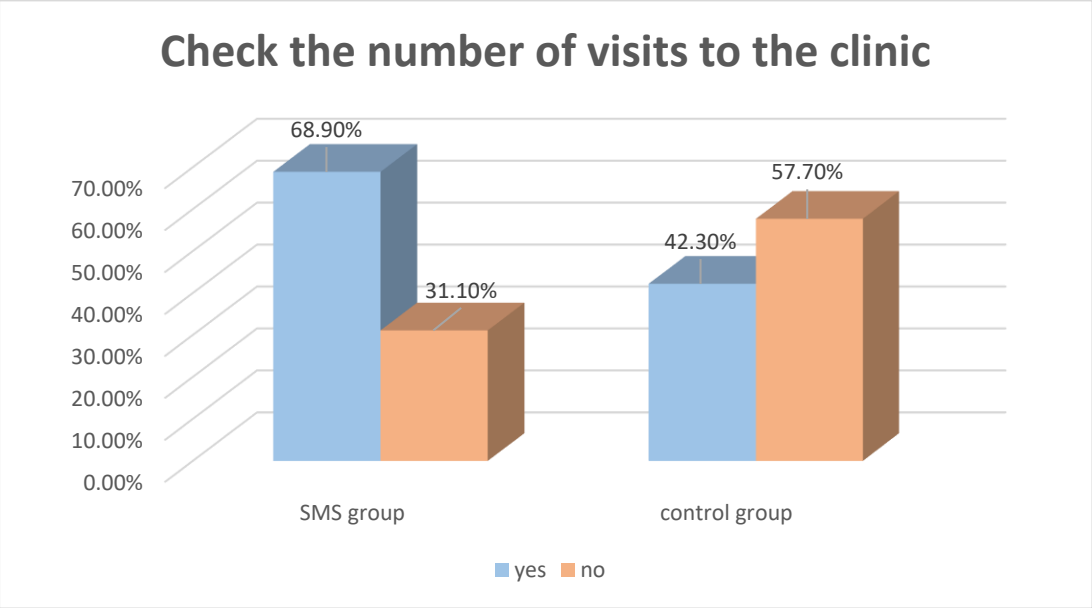

Figure 3. Checking the Rate of Referral to the Clinic

Figure 3 compares referrals to the clinic between the two groups, with significantly higher rates in the SMS group.

Patient Outcomes:

The recovery time was significantly shorter in the SMS group (22.37 ± 5.42 days) compared to the control group (28.71 ± 6.89 days) (P = 0.027). The rate of wound infection was also significantly lower in the SMS group (5.6%) compared to the control group (8.7%) (P = 0.041).

Patient Satisfaction:

Patient satisfaction was significantly higher in the group receiving SMS compared to the control group (P = 0.024). In the control group, patient satisfaction levels were low (21.4%), moderate (34.8%), good (25.7%), and excellent (18.1%). In the group receiving SMS, patient satisfaction levels were low (17.3%), moderate (29.4%), good (37.2%), and excellent (26.1%) (Figure 4).

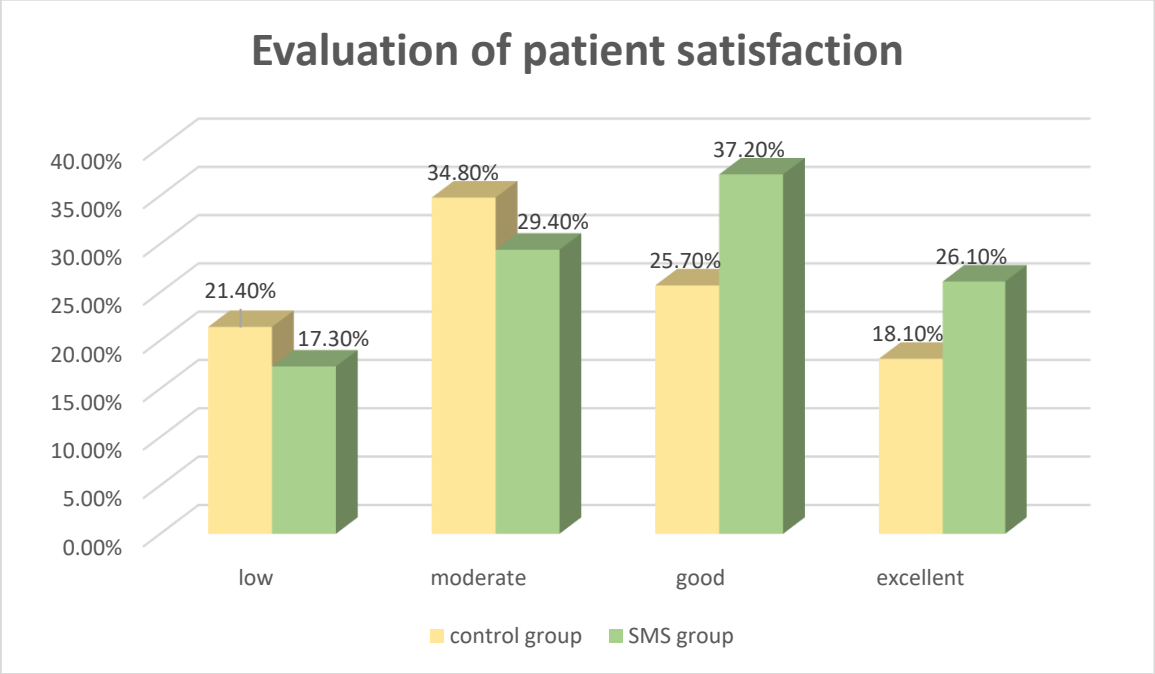

Figure 4. Evaluation of Patient Satisfaction

Figure 4 compares patient satisfaction between the two groups, with significantly higher satisfaction in the SMS group.

DISCUSSION

Our study included a diverse sample of trauma patients (n = 340) with a mean age of 33.47 ± 8.54 years, comprising 37.05% females and 62.95% males. The distribution of trauma types aligns with existing literature, which often categorizes acute injuries similarly, indicating that our sample is representative of the trauma patient population. This demographic data enhances the relevance of our findings, as they can be generalized to similar patient cohorts.

Treatment Adherence

A crucial finding of our research is the enhanced treatment adherence in the SMS group (35.7% good adherence) compared to the control group (18.3% good adherence), with a statistically significant difference (P = 0.036). This improvement supports findings from similar studies that highlight the efficacy of SMS reminders in improving adherence among varied patient populations. For example, a recent study by Bobrow et al. and Chow et al. [10-11] found that SMS reminders led to a notable increase in adherence rates among patients with chronic conditions. This evidence suggests that regular communication via SMS effectively keeps patients engaged in their treatment plans, thereby fostering better health-related behaviors.

Revisits to the Emergency Department

The study also revealed that the rate of revisits to the emergency department was significantly lower in the SMS group (36.8%) compared to the control group (61.4%) (P = 0.019). This reduction in emergency department revisits corroborates findings from previous studies, such as the work of Dexheimer et al. [12], which also reported decreased revisits in patients receiving mobile health interventions. By ensuring that

patients remain informed and engaged with their care routine, SMS follow-ups may preemptively address potential complications, thereby reducing unnecessary emergency room visits.

Referral to the Clinic

Regarding referrals to follow-up care, the SMS group saw a significantly higher rate (68.9%) compared to the control group (42.3%) (P = 0.031). This indicates that SMS communication not only encourages adherence during initial treatment but also promotes continuity of care through appropriate referrals. Previous literature, such as that by Hofmann et al. [13], also supports this observation, illustrating that SMS interventions significantly improved follow-up rates in orthopedic patients. Improved referral rates could lead to better long-term outcomes, as patients are more likely to receive comprehensive care when encouraged through effective reminders.

Patient Outcomes

Our study found that the SMS group had a shorter recovery time (22.37 ± 5.42 days) compared to the control group (28.71 ± 6.89 days) (P = 0.027) and a lower wound infection rate (5.6% SMS vs. 8.7% control, P = 0.041). These findings are particularly noteworthy, suggesting that SMS follow-ups may directly influence clinical outcomes. The literature consistently shows that effective communication is a vital component in managing postoperative recovery [14]. By facilitating timely reminders and care instructions, SMS interventions foster adherence, which in turn may lead to faster healing and reduced infection rates among trauma patients.

The mechanism by which SMS reminders accelerate healing and decrease complications likely involves several interconnected factors. Enhanced treatment adherence is a primary driver—when patients consistently take their medications, follow wound care protocols, and attend follow-up appointments, they are more likely to experience optimal recovery. SMS reminders serve as a consistent nudge, helping patients remember and act upon their treatment plans, particularly in managing their injuries and post-discharge care.

Moreover, the nature of injuries in our sample varied widely. Certain injuries, such as soft tissue injuries, may require meticulous wound care to avoid infection, while others, such as fractures, necessitate strict adherence to immobilization or physical therapy. The SMS reminders tailored to specific treatment needs help address these nuances effectively, ensuring that patients understand the critical nature of their treatment regime. Patient factors such as age, socioeconomic status, and prior health literacy may also play a role; for example, younger patients may be more responsive to SMS technologies compared to older demographics.

Patient Satisfaction

Finally, our study demonstrated significantly higher patient satisfaction levels in the SMS group (good: 37.2%, excellent: 26.1%) compared to the control group (good: 25.7%, excellent: 18.1%) (P = 0.024). Higher satisfaction levels are consistent with findings from studies emphasizing the importance of patient engagement and communication in enhancing the overall treatment experience [15]. This underscores the notion that patients value proactive communication, which may lead to a more positive perception of their care.

CONCLUSION

In summary, our findings align with and extend the existing body of literature supporting the efficacy of SMS follow-up

interventions in trauma care. The significant differences observed in treatment adherence, emergency department revisits, referral rates, recovery times, infection rates, and patient satisfaction highlight the critical role of effective communication in improving patient outcomes. Future research should explore the long-term impacts of SMS follow-ups and the potential for integrating similar technologies into other treatment protocols across diverse healthcare settings [16].

Limitations of the Study:

Restrictions on the volume and content of text messages

Possibility of patients not reading messages sent by research units

Differences between individuals in terms of their level of attention and adherence to treatment

Conflict of Interest:

All authors declare no personal or financial conflicts of interest.

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تأثير متابعة الرسائل النصية القصيرة على نتائج العلاج ورضا المريض لدى مرضى الصدمات: تجربة عشوائية محكومة

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الملخص

الخلفية والأهداف: تعمل قنوات الاتصال مثل الرسائل النصية القصيرة على تحسين التزام المريض بالعلاج ونتائج الرعاية الصحية بشكل عام. بحثت هذه الدراسة في تأثير متابعة الرسائل النصية القصيرة على نتائج العلاج ورضا المريض لدى مرضى الصدمات الذين خرجوا من قسم الطوارئ.

منهجية الدراسة: شملت هذه التجربة العشوائية المحكومة مرضى الصدمات الذين احتاجوا إلى العلاج بعد خروجهم من قسم الطوارئ في مستشفى هفت تير في طهران، إيران. تم تعيين المرضى عشوائيًا إما في مجموعة متابعة الرسائل النصية القصيرة أو مجموعة تحكم لم تتلق أي رسائل نصية قصيرة. تلقت مجموعة متابعة الرسائل النصية القصيرة رسائل نصية تحتوي على تذكيرات حول الالتزام بالأدوية وتعليمات العناية بالجروح وجداول مواعيد العيادة.

النتائج: تم تضمين ما مجموعه 340 مريضًا بمتوسط أعمار 33.47 ± 8.54 عامًا في الدراسة. ومن بين هؤلاء، كان 126 من الإناث (37.05٪) و 214 من الذكور (62.95٪). أظهرت مجموعة متابعة الرسائل القصيرة التزامًا بالعلاج أعلى بشكل ملحوظ من مجموعة التحكم (P = 0.036).بالإضافة إلى ذلك، كان لدى مجموعة الرسائل القصيرة معدلات إصابة بالجروح أقل بشكل ملحوظ (P = 0.021) وأوقات شفاء أقصر .(P = 0.043) كما كان رضا المرضى أعلى بشكل ملحوظ في مجموعة الرسائل القصيرة مقارنة بمجموعة التحكم.(P = 0.024)

الاستنتاج: تشير نتائج هذه الدراسة إلى أن متابعة الرسائل القصيرة يمكن أن تحسن بشكل كبير نتائج العلاج ورضا المرضى في مرضى الصدمات الذين خرجوا من قسم الطوارئ. يمكن أن تساعد متابعة الرسائل القصيرة في تحسين التزام المرضى بالعلاج وتقليل معدلات إصابة الجروح وتسريع أوقات الشفاء. بالإضافة إلى ذلك، يمكن أن تعزز متابعة الرسائل القصيرة رضا المرضى من خلال تقديم تذكيرات ودعم في الوقت المناسب.

الكلمات الدالة: الرسائل القصيرة، الصدمات، قسم الطوارئ، الالتزام بالعلاج، رضا المرضى.