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Article Information Overview

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Article type Article

Title The Effect of Education through Short Message Service (SMS) Messages on Diabetic Patients Adherence

Journal *Scientia Pharmaceutica*

Volume 85

Issue 2

Special Issue **Selected Papers from the International Seminar on Pharmacology and Clinical Pharmacy (ISPCP-ITB 2016)**

Abstract Poor adherence and a lack of understanding of medication instructions for oral antidiabetic use are key factors that inhibit the control of glycemic levels. The aforementioned situation needs intervention to improve medication adherence and the therapy. This study was conducted with a quasi-experimental design with prospective data collection. The subjects of this study were 50 outpatients with type 2 diabetes mellitus (T2DM) who had received oral antidiabetic medicine therapy at least six months prior to adherence measurement. The patients were classified into two groups—the control group and the intervention group. The intervention group received Short Message Service (SMS) messages of diabetes education, while the control group did not. Data collection was conducted by doing interviews and administering the Morisky Medication Adherence Scale (MMAS) questionnaire. The results showed the increase in adherence in the intervention group as 1.15 ± 1.04 and that in the control group as 0.72 ± 0.90 . These results indicated that there were significant differences in MMAS score between the control and intervention groups ($p < 0.05$). The decrease in fasting blood glucose and glucose measured 2 h postprandially was greater in the intervention group than that in the control group. It was concluded that the provision of education through SMS had a positive effect on medication adherence and glycemic levels.

Keywords Short Message Service (SMS); adherence; glycemic control; diabetes



Author Information

Submitting Author Wirawan Adikusuma
Corresponding Author Wirawan Adikusuma

Author #1 Wirawan Adikusuma
Affiliation 1. Faculty of Health Science, University of Muhammadiyah Mataram, Mataram 83127, Indonesia
E-Mail adikusuma28@gmail.com

Author #2 Nurul Qiyaam
Affiliation 1. Faculty of Health Science, University of Muhammadiyah Mataram, Mataram 83127, Indonesia
E-Mail nuqi.gra@gmail.com

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Previously Published Papers

Wong, C.-S.; Chen, T.-T.; Chang, W.-P.; Wong, H.S.-C.; Wu, M.-Y.; Adikusuma, W.; Lin, Y.-F.; Chang, W.-C. Prognostic Effect of Comorbid Disease and Immune Gene Expression on Mortality in Kidney Cancer—A Population Based Study. *Cancers* **2020**, *12*, 1654. doi: [10.3390/cancers12061654](https://doi.org/10.3390/cancers12061654)

Muhammad Irham, L.; Chou, W.-H.; Wang, Y.-S.; Adikusuma, W.; Sung-Ching Wong, H.; Aryani Perwitasari, D.; Huang, W.-C.; Chen, B.-K.; Yang, H.-I.; Chang, W.-C. Evaluation for the Genetic Association between Store-Operated Calcium Influx Pathway (STIM1 and ORAI1) and Human Hepatocellular Carcinoma in Patients with Chronic Hepatitis B Infection. *Biology* **2020**, *9*, 388. doi: [10.3390/biology9110388](https://doi.org/10.3390/biology9110388)

Adikusuma, W.; Chou, W.-H.; Lin, M.-R.; Ting, J.; Irham, L.M.; Perwitasari, D.A.; Chang, W.-P.; Chang, W.-C. Identification of Druggable Genes for Asthma by Integrated Genomic Network Analysis. *Biomedicines* **2022**, *10*, 113. doi: [10.3390/biomedicines10010113](https://doi.org/10.3390/biomedicines10010113)

Santri, I.N.; Irham, L.M.; Djallilah, G.N.; Perwitasari, D.A.; Wardani, Y.; Phiri, Y.V.A.; Adikusuma, W. Identification of Hub Genes and Potential Biomarkers for Childhood Asthma by Utilizing an Established Bioinformatic Analysis Approach. *Biomedicines* **2022**, *10*, 2311. doi: [10.3390/biomedicines10092311](https://doi.org/10.3390/biomedicines10092311)

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Journal	Sci. Pharm. (https://www.mdpi.com/journal/scipharm) (ISSN 2218-0532)
Manuscript ID	scipharm-184777
Type	Article
Title	Effect of Education through Short Message Service (SMS) to Adherence Diabetic Patients (https://www.mdpi.com/2218-0532/85/2/23)
Authors	Wirawan Adikusuma * , Nurul Qiyaam
Special Issue	Selected Papers from the International Seminar on Pharmacology and Clinical Pharmacy (ISPCP-ITB 2016) (https://www.mdpi.com/journal/scipharm/special_issues/ISPCP-ITB_2016)

Abstract Poor adherence and lack of understanding about medication instructions for oral antidiabetics use are the key factors that inhibited the control of glycemic levels. The aforementioned condition needs intervention to improve medication adherence and the success of therapy. This study was conducted with quasi-experimental design with prospective data collection. The subjects of this study were 50 patients with type 2 diabetes melitus (T2DM) who had received oral antidiabetic drug therapy at least six months prior to adherence measurement. Patients were classified into two groups (control group and intervention group). The intervention group received text message or Short Message Service (SMS) about diabetes education, while control group did not receive these. Data collection was conducted by doing interview and giving Morisky Medication Adherence Scale (MMAS) questionnaire. The results showed that the increase of adherence in the intervention group 1.15 ± 1.04 and the control group 0.72 ± 0.90 . These results indicated that there were significant differences in MMAS score between the control and intervention group ($P < 0.05$). Decrease in fasting blood glucose and glucose 2 hour postprandial greater in the intervention group than the control group. It was concluded that the provision of education through SMS give a positive effect on medication adherence and glycemic levels.

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Author's Notes i have done revision. Please see attached file.

Author's Notes File [Report Notes \(/user/review/displayFile/2719940/ewTHF21A?file=author-coverletter&report=1708444\)](#)

Review Report Form

English language and style English very difficult to understand/incomprehensible
 Extensive editing of English language and style required
 Moderate English changes required
 English language and style are fine/minor spell check required
 I don't feel qualified to judge about the English language and style

	Yes	Can be improved	Must be improved	Not applicable
Does the introduction provide sufficient background and include all relevant references?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the research design appropriate?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the methods adequately described?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are the results clearly presented?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the conclusions supported by the results?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments and Suggestions for Authors

Thank you for the opportunity to review this manuscript. The paper presents data on a SMS intervention to improve diabetes self-management, which is a common health problem in need of innovative solutions. The use of newer technology is a strength and is likely to increase readers' interest in this paper. The main problems with the paper at this point are areas where not enough detail is provided. Overall, I recommend that the authors review the TREND guideline for elements to include in a report of a non-



randomized clinical

trial: https://www.cdc.gov/trendstatement/pdf/trendstatement_trend_checklist.pdf Some specific examples are that the manuscript needs more information about:

- content of the SMS messages (e.g., a table of common topics)
- who delivered the SMS messages (pharmacists are mentioned in the discussion: was it a pharmacist?)
- how the interventionist selected what messages to deliver (did they have a list of standard information that they could select from? Were the same messages given to every participant? Was there an algorithm for matching messages to patients' needs?)
- method of assigning participants to groups (nonrandomized, but how specifically was this done? Every other patient? Naturally existing groups of some kind?)
- more information about the patients who refused to participate in the study (how many, any demographic differences from participants, any information on why they refused?)
- any attrition or missing data? If so, who, how much, any demographic differences by group?
- was the analysis performed an intent-to-treat or completers analysis? (for many of these issues a diagram would help, showing the number of patients recruited, enrolled, randomized, retained, and included in analyses -- again, see the TREND website for an example)

I also had two specific questions about the analyses:

- why were nonparametric statistics used to analyze the MMAS scores? (e.g., was there a concern about normality?)
- why was chi square used to test potential confounding variables' effects on MMAS scores (the Morisky scale was treated as ordinal-level, not categorical, in the main outcome analysis)




In addition to these concerns, I can also see at least one potential challenge to interpretation of the results: The authors characterize the SMS messages as "patient education" but a better description might be "self-management" because the intended effect was behavior change rather than simply increased knowledge. Thinking of the intervention as a behavior-change program, I wondered whether the observed effect was really due to education (i.e., content of the messages), or to mere attention (receiving reminders, feeling that someone cares and is paying attention to adherence)? Mere attention effects could also explain why adherence improved over time in the control group, a finding that otherwise seems a bit mysterious.

Submission Date 02 March 2017

Date of this review 16 Mar 2017 21:27:50



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Journal [Sci. Pharm. \(https://www.mdpi.com/journal/scipharm\)](https://www.mdpi.com/journal/scipharm) (ISSN 2218-0532)

Manuscript ID [scipharm-184777](#)

Type Article

Title [Effect of Education through Short Message Service \(SMS\) to Adherence Diabetic Patients \(https://www.mdpi.com/2218-0532/85/2/23\)](https://www.mdpi.com/2218-0532/85/2/23)

Authors Wirawan Adikusuma * , Nurul Qiyaam

Special Issue [Selected Papers from the International Seminar on Pharmacology and Clinical Pharmacy \(ISPCP-ITB 2016\) \(https://www.mdpi.com/journal/scipharm/special_issues/ISPCP-ITB_2016\)](https://www.mdpi.com/journal/scipharm/special_issues/ISPCP-ITB_2016)

Abstract Poor adherence and lack of understanding about medication instructions for oral antidiabetics use are the key factors that inhibited the control of glycemic levels. The aforementioned condition needs intervention to improve medication adherence and the success of therapy. This study was conducted with quasi-experimental design with prospective data collection. The subjects of this study were 50 patients with type 2 diabetes melitus (T2DM) who had received oral antidiabetic drug therapy at least six months prior to adherence measurement. Patients were classified into two groups (control group and intervention group). The intervention group received text message or Short Message Service (SMS) about diabetes education, while control group did not receive these. Data collection was conducted by doing interview and giving Morisky Medication Adherence Scale (MMAS) questionnaire. The results showed that the increase of adherence in the intervention group 1.15 ± 1.04 and the control group 0.72 ± 0.90 . These results indicated that there were significant differences in MMAS score between the control and intervention group ($P < 0.05$). Decrease in fasting blood glucose and glucose 2 hour postprandial greater in the intervention group than the control group. It was concluded that the provision of education through SMS give a positive effect on medication adherence and glycemic levels.



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English language () English very difficult to understand/incomprehensible
and style () Extensive editing of English language and style required

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Does the introduction provide sufficient background and include all relevant references?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the research design appropriate?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the methods adequately described?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the results clearly presented?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the conclusions supported by the results?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments and
Suggestions for
Authors

Thank you for your attention to my previous comments. The addition of process details about the intervention and the participant flow through the study are helpful, and gave me additional confidence in the study's methodology. Other than some English-language editing, I have no further suggestions.

Submission Date 02 March 2017

Date of this review 03 May 2017 04:25:55



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Author's Notes

The results of normality test (Kolmogrov-Smirnov) show that score MMAS in the the control and treatment group data were not normally distributed, therefore the statistical test used non parametric test, Wilcoxon and Mann Whitney test.

Chi-square test was used to test the correlation between adherence and characteristics with table 2 x 2

Please see attached file

Author's Notes File

Report Notes (</user/review/displayFile/2737833/xwW640QH?file=author-coverletter&report=1720003>)

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Are the results clearly presented?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



Are the conclusions supported by the results? (x) () () ()

Comments and
Suggestions for
Authors

This is a very interesting study. However, I found it a little difficult to read due to the less than ideal English sentence formation and style. I have included some example of sentence restructuring to, hopefully, assist with your revisions. I would suggest allowing a native English speaker to review your manuscript prior to resubmitting. Overall, I think the study was well designed and will be helpful in designing future studies and interventions to improve medication adherence in T2DM patients in low-resources environments.

peer-review-1720003.v1.docx (/user/review/displayFile/2737833/xwW640QH?
file=review&report=1720003)

Submission Date 02 March 2017

Date of this review 04 Apr 2017 15:53:46

