

The efficacy of WeChat-based multidisciplinary full-course nutritional management program on the nutritional status of ovarian cancer patients undergoing chemotherapy: a Randomized Controlled Trial

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The efficacy of WeChat-based multidisciplinary full-course nutritional management program on the nutritional status of ovarian cancer patients undergoing chemotherapy: a Randomized Controlled Trial

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Abstract

Background: As the most malignant type of cancer in the female reproductive system, ovarian cancer (OC) has become the second leading cause of death among Chinese women. Chemotherapy is the main treatment for patients with OC, and its numerous adverse effects can easily lead to malnutrition. It is difficult to centrally manage patients with OC in the intervals between chemotherapy. The use of WeChat, an effective mobile tool, in chronic disease management has been highlighted.

Objective: This study aimed to implement a continuous follow-up strategy and health monitoring based on the WeChat platform for patients with OC undergoing chemotherapy to ensure that each phase of chemotherapy was delivered on schedule and to improve the survival rate of patients with OC.

Methods: Participants were recruited and randomly assigned to either the WeChat-based nutrition intervention group or the usual care group. A self-administered general information questionnaire was used at enrollment to obtain basic information about the patients. The Patient-Generated Subjective Global Assessment (PG-SGA) Scale was used to investigate the nutritional status of the patients at 3 time points (T0=before the first admission to the hospital for chemotherapy, T1=2 weeks after the first chemotherapy, and T6=2 weeks after the sixth chemotherapy). The blood indices of patients were investigated through the in-hospital health care system at 3 times (T0=before the first admission to the hospital for chemotherapy, T1=2 weeks after the first chemotherapy, and T6=2 weeks after the sixth chemotherapy). Patients in the intervention group were introduced to the nutrition applet, invited to join the nutrition management group chat, and allowed to consult on nutritional issues in private chats with nutrition management team members. Linear mixed models were used to analyze changes in each nutritional indicator in the 2 groups, with their baseline measurements as covariates; with group, time, and group-time interactions considered as fixed effects; and with patients considered as random effects.

Results: A total of 96 patients with OC undergoing chemotherapy were recruited into the study. Distribution was based on a 1:1 ratio, with 48 patients each in the nutrition intervention group and the usual care group. The attrition rate after the first chemotherapy session was 18.75%. The mixed linear model revealed that the group-based effect and the group-time interaction effect on PG-SGA scores were significant ($F_{38,38}=4.763$, $P=.03$; $F_{37,37}=6.368$, $P=.01$), whereas the time-based effect on PG-SGA scores was not ($F_{38,38}=0.377$; $P=.54$). The findings indicated that the group-based effect, the time-based effect, and the group-time interaction effect on nutrition-inflammation composite indices were significant ($F_{38,38}=7.653$, $P=.006$; $F_{38,38}=13.309$, $P<.001$; $F_{37,37}=92.304$, $P<.001$; $F_{37,38}=110.675$, $P<.001$; $F_{38,38}=10.379$, $P=.002$; and $F_{37,37}=5.289$, $P=.02$).

Conclusions: This study provided evidence that a WeChat-based, multidisciplinary, full-course nutritional management program can significantly improve the nutritional status of patients with OC during chemotherapy.

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Letters to the Editor

Response to the comment [1] on "Efficacy of a WeChat-Based, Multidisciplinary, Full-Course Nutritional Management Program on the Nutritional Status of Patients With Ovarian Cancer Undergoing Chemotherapy: Randomized Controlled Trial"[2]

Thank you for the thoughtful feedback on our study. We fully acknowledge the valid concern regarding the terminology used in Figure 7 and have revised the manuscript accordingly. Below is our point-by-point response:

1. Terminology Revision and Figure Re-labeling

As suggested, we have revised the title of Figure 7 from "Inflammation-Related Blood Indices" to "Changes in Chemotherapy-Associated Hematological Indices." The figure legend now explicitly states: "Changes in leukocyte, neutrophil, lymphocyte, and platelet levels primarily reflect chemotherapy-induced bone marrow suppression (BMS), while potentially indicating indirect modulation of systemic inflammation." This adjustment aligns with the pathophysiology of chemotherapy patients [3].

2. Expanded Discussion on BMS

A new subsection titled "Impact on Bone Marrow Suppression" has been added to the Results section:

Aggravated BMS in the Control Group: The control group's leukocyte count approached the diagnostic threshold for leukopenia ($<4.0 \times 10^9/L$) [4], suggesting intensified myelotoxicity due to inadequate nutritional support.

Potential Protective Effect in the Intervention Group: The intervention group exhibited a 44% smaller decline in platelet counts ($\Delta=18 \times 10^9/L$ vs. $\Delta=32 \times 10^9/L$ in controls), which may correlate with nutritional support improving the hematopoietic microenvironment [5].

3. Mechanistic Interpretation and Limitations

In the Discussion section, we added a paragraph detailing potential mechanisms by which nutritional intervention mitigates BMS:

Inflammation-Bone Marrow Axis Modulation: Reduced systemic inflammation (e.g., decreased NLR) may alleviate cytokine-mediated suppression of hematopoietic stem cells [5].

Additionally, we clarified limitations in the revised manuscript: "This study did not directly assess BMS severity via bone marrow biopsies. Future studies should incorporate progenitor cell colony-forming assays for validation."

4. Enhanced Clinical Significance

We emphasized the broader implications: "The WeChat-based nutritional program not only improves nutritional status but may also enhance chemotherapy tolerance through multi-target mechanisms, including BMS attenuation. This underscores the transformative potential of mobile health in oncology supportive care."

References

[1] Comment on "Efficacy of a WeChat-Based, Multidisciplinary, Full-Course Nutritional Management Program on the Nutritional Status of Patients With Ovarian Cancer Undergoing Chemotherapy: Randomized Controlled Trial"

[2] Tian X, Liu Y, Zhang J, Yang L, Feng L, Qi A, Liu H, Liu P, Li Y. Efficacy of a WeChat-Based, Multidisciplinary, Full-Course Nutritional Management Program on the Nutritional Status of Patients With Ovarian Cancer Undergoing Chemotherapy: Randomized Controlled Trial. *JMIR Mhealth Uhealth* 2024 Nov 4;12:e56475–e56475. doi: 10.2196/56475

[3] Crawford J, Dale DC, Lyman GH. Chemotherapy-induced neutropenia: risks, consequences, and new directions for its management. *Cancer*. 2004 Jan 15;100(2):228-37. doi: 10.1002/cncr.11882. Erratum in: *Cancer*. 2004 May 1;100(9):1993-4. PMID: 14716755.

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