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Application of Health Education Prescriptions in Patients with Vulvovaginal Candidiasis

Hu Nüying[1], Wang Ao[2], Liu Jie[3]

Abstract

Vulvovaginal candidiasis (VVC) is a common gynecological infection with a high recurrence rate, posing significant challenges for long-term disease management. Although antifungal therapy remains the mainstay of treatment, its effectiveness is often limited by inadequate patient knowledge, poor treatment adherence, and insufficient lifestyle and hygiene management. These limitations highlight the need for complementary non-pharmacological interventions, particularly structured health education strategies, to improve clinical outcomes and prevent recurrence. This study aimed to investigate the effectiveness of health education prescription interventions in improving clinical symptoms, signs, and recurrence rates among patients with VVC. A total of 200 patients diagnosed with VVC and meeting the inclusion criteria were randomly assigned to an experimental group (n = 100) and a control group (n = 100). Both groups received standard antifungal drug treatment. In addition, the experimental group received a structured health education intervention for 6 months, including education on disease knowledge, medication guidance, personal hygiene, lifestyle modification, and strategies to prevent recurrence. Clinical symptom and sign scores were assessed before intervention, during mid-treatment, and after treatment. The number of VVC recurrences during the intervention period was also recorded. Statistical analysis was performed to compare outcomes between the two groups. There were no statistically significant differences between the two groups in baseline characteristics or pre-intervention indicators ($p > 0.05$). Following intervention, both groups showed improvements in symptom and sign scores and reduced recurrence rates. However, the experimental group demonstrated significantly lower symptom and sign scores and a markedly lower recurrence rate than the control group ($p < 0.05$). Health education prescription interventions can significantly enhance the effectiveness of conventional VVC treatment by improving symptom control and reducing recurrence. This approach has significant clinical value and warrants broader implementation and further research in gynecological practice.

Keywords: *Applied research, Health education prescription, Vulvovaginal candidiasis*

A. Introduction

Vulvovaginal candidiasis (VVC) represents one of the most prevalent fungal infections affecting women worldwide and constitutes a persistent challenge in reproductive health care (Sobel, 2007; Workowski et al., 2021). Epidemiological studies indicate that nearly 75% of women experience at least one episode of VVC during their lifetime, while approximately 5%–8% develop recurrent vulvovaginal candidiasis (RVVC), a chronic condition characterized by

[1]School of Physical Education, Southwest University, Chongqing 400715. China. hvying2025@163.com
[2]School of National Governance, Southwest University, Chongqing 400715. China
[3]Hospital of Southwest University, Chongqing 400715. China

frequent relapses despite appropriate treatment (Sobel, 2016; Rosati et al., 2020). This high recurrence rate is particularly striking given the widespread availability of antifungal therapies and reflects a paradox in current clinical practice: although pharmacological management is effective in controlling acute symptoms, long-term disease control remains suboptimal. Clinically, VVC is associated with vulvar pruritus, burning sensations, dyspareunia, dysuria, and abnormal vaginal discharge, which substantially impair daily functioning, sexual health, psychological well-being, and overall quality of life (Donders et al., 2010).

Despite its high prevalence and disease burden, VVC is frequently underestimated or inadequately managed in routine clinical settings. One of the key factors contributing to its high recurrence rate is insufficient patient awareness regarding disease etiology, medication adherence, hygiene practices, and lifestyle-related risk factors (Fidel & Sobel, 2014). Existing literature has largely focused on microbiological mechanisms, host immune responses, and antifungal pharmacotherapy, emphasizing short-term symptom resolution rather than long-term disease prevention (Sobel et al., 2019). Moreover, prolonged or repeated antifungal use has raised increasing concerns regarding antifungal resistance, altered vaginal microecology, and diminishing therapeutic effectiveness, further complicating disease management (Perlin et al., 2017).

In response to these limitations, recent studies have highlighted the importance of adjunctive non-pharmacological interventions, particularly structured health education strategies. Health education prescriptions provide individualized, systematic, and actionable guidance encompassing disease knowledge, medication use, personal hygiene, lifestyle modification, and recurrence prevention. Evidence suggests that such interventions can improve treatment adherence and self-management, thereby enhancing clinical outcomes (Buggio et al., 2019). Chen Fengqin et al. (2022) demonstrated that integrating WeChat-based health education prescriptions with conventional treatment significantly improved disease-related knowledge, medication compliance, and clinical efficacy among women of childbearing age, while effectively reducing recurrence rates. Similarly, Deng Yanan (2020) reported that combining integrated Chinese and Western medicine approaches with systematic health education resulted in superior therapeutic outcomes compared to monotherapy, underscoring the critical role of patient education in consolidating treatment effects.

However, despite these encouraging findings, current research remains limited by heterogeneous intervention designs, short follow-up durations, and insufficient comparative analyses. There is a lack of robust evidence evaluating the sustained clinical benefits of standardized health education prescription interventions when combined with conventional antifungal therapy for VVC patients. Consequently, the integration of such interventions into routine clinical practice remains inconsistent and underutilized.

Against this backdrop, the present study aims to compare the clinical efficacy of conventional antifungal treatment alone with that of conventional treatment combined with a structured health education prescription intervention in patients with VVC. By assessing symptom severity, clinical signs, and recurrence rates, this study seeks to provide empirical evidence supporting a more comprehensive, patient-centered management strategy. This approach is particularly important for reducing disease recurrence, minimizing antifungal resistance, improving quality of life, and optimizing long-term health outcomes for women affected by VVC.

B. Methods

Study Population

This study enrolled 210 VVC patients who attended the University Hospital of Southwest University between March and September 2023. Participants were randomly assigned to either an experimental or a control group using a random number table, with 105 patients in each group. During the study, five patients from each group were lost to follow-up due to non-adherence. Ultimately, 200 patients completed the study and were included in the analysis: 100 in the control group and 100 in the experimental group. The study protocol was reviewed and approved by the hospital ethics committee. All enrolled patients fully understood the study content and signed informed consent forms.

Diagnostic Criteria

The diagnosis of vulvovaginal candidiasis (VVC) in this study was established based on the Chinese Guidelines for the Diagnosis and Treatment of Vulvovaginal Candidiasis (2024 Edition) and the 2021 U.S. Centers for Disease Control and Prevention (CDC) Sexually Transmitted Infections Treatment Guidelines (Li et al., 2024; Workowski et al., 2021). A definitive diagnosis required the simultaneous presence of typical clinical symptoms and objective laboratory evidence. Clinically, patients presented with vulvovaginal itching and burning sensations accompanied by increased vaginal discharge, alongside physical signs such as vulval erythema, congestion, fissures, excoriations, and whitish or curd-like discharge. Laboratory confirmation was obtained by microscopic examination with a 10% potassium hydroxide (KOH) wet mount or Gram staining, revealing spores, budding yeast, or hyphae, or by fungal culture demonstrating Candida growth. The integration of clinical manifestations and laboratory findings follows internationally accepted diagnostic standards to ensure diagnostic accuracy and consistency (Sobel, 2016; Donders et al., 2010).

Inclusion Criteria

Participants eligible for inclusion were adult women aged 18 years or older with a confirmed diagnosis of uncomplicated VVC. All participants were required to have complete clinical records and demonstrate the ability to perform self-care, maintain clear consciousness, and comply with treatment requirements. Additionally, participants were fully informed about the study objectives, procedures, and potential risks, and voluntarily provided written informed consent prior to enrollment. These criteria were designed to ensure participant safety, data completeness, and ethical compliance in accordance with international clinical research standards (World Medical Association, 2013).

Exclusion Criteria

Patients were excluded from participation if they presented with vulvovaginal inflammation caused by coexisting infections, such as bacterial vaginosis or trichomoniasis, or if they had a history of cervical malignancy. Pregnant or lactating women were excluded due to physiological changes that may alter vaginal microecology and confound treatment outcomes. Additional exclusion criteria included the presence of acute illnesses preventing cooperation, severe comorbid conditions affecting major organ systems, and a history of psychiatric disorders, communication impairment, or cognitive dysfunction. Furthermore, any condition deemed unsuitable for study participation by the investigator was grounds for exclusion, ensuring patient safety and methodological rigor (Sobel, 2007; Workowski et al., 2021).

Withdrawal and Exclusion Criteria

Participants were withdrawn from the study if they failed to adhere to the prescribed treatment regimen, missed scheduled follow-up visits, or were lost to follow-up during the intervention period. Withdrawal also occurred if participants concurrently enrolled in other clinical studies, voluntarily withdrew consent, or if no outcome data were available following randomization. These criteria were established to preserve data integrity and align with best practices for clinical trial management and analysis (Friedman et al., 2015).

Intervention Method

All participants received standard antifungal medication as baseline therapy. In addition, patients in the experimental group underwent a structured health education prescription intervention lasting six months. Interim assessments were conducted at three months to evaluate treatment adherence and reinforce educational guidance, while final efficacy was assessed at the conclusion of the six-month intervention. This duration was selected based on recommendations for evaluating recurrence prevention and long-term management outcomes in VVC (Sobel, 2016).

Control Group

Patients in the control group received only conventional antifungal treatment, without additional health education, nursing guidance, or lifestyle interventions. The treatment regimen consisted of oral fluconazole capsules at 50–150 mg daily, combined with intravaginal miconazole nitrate cream once daily. Each treatment course lasted seven days and was repeated as clinically indicated over a six-month period. This regimen is consistent with established first-line treatment recommendations for uncomplicated and recurrent VVC (Workowski et al., 2021; Satora et al., 2023).

Experimental Group

In addition to standard pharmacological treatment, patients in the experimental group received a structured health education prescription intervention. Individualized patient records were established, documenting demographic characteristics, disease history, diagnostic findings, and treatment details. Each participant received a personalized health education prescription covering disease-related knowledge, lifestyle modifications, treatment adherence, and strategies to prevent recurrence. The educational content emphasized appropriate vulvar hygiene practices, sexual behavior management, balanced nutrition, avoidance of smoking and alcohol consumption, stress management, and engagement in moderate physical activity. Guidance on strict medication adherence, antibiotic misuse avoidance, partner management, and glycemic control in diabetic patients was also provided. These intervention components were formulated based on evidence demonstrating the role of behavioral and lifestyle factors in maintaining vaginal microecological balance and reducing VVC recurrence (Fidel & Sobel, 2014; Buggio et al., 2019).

Observation Indicators

Clinical outcomes were evaluated using multiple observation indicators. Symptom severity and clinical signs—including itching, redness, excoriation, fissures, and abnormal vaginal discharge—were assessed at baseline, mid-intervention, and six months post-intervention in accordance with the Revised Guidelines for Diagnosis and Treatment of Vulvovaginal Candidiasis (Liu & Liao, 2012). Each indicator was scored on a four-point scale ranging from 0 (none) to 3 (severe), with lower scores indicating milder disease manifestations. Disease recurrence was defined as a medically confirmed episode of VVC occurring after initial

symptom resolution and was recorded at each assessment point, consistent with established definitions of recurrent VVC (Sobel, 2016).

Data Collection

Baseline and follow-up data were obtained from the hospital electronic medical record system, including demographic variables, disease duration, educational level, marital status, and clinical indicators. Data collection was conducted by trained gynecological nurses using standardized instructions to ensure consistency and accuracy. Face-to-face guidance was provided during questionnaire completion, with assistance offered to participants experiencing comprehension difficulties. All questionnaires were completed and collected on-site, yielding a 100% response rate and ensuring data reliability and completeness (Polit & Beck, 2021).

Statistical Analysis

Statistical analysis was performed using SPSS version 27.0. Categorical variables were summarized as frequencies and percentages and compared between groups using chi-square tests. Continuous variables with normal distributions were reported as mean ± standard deviation and analyzed using independent-samples t-tests. Changes in symptom scores over time were analyzed using repeated measures analysis of variance (ANOVA) to assess the main effects of time, group, and time-by-group interactions. When significant interaction effects were detected, simple effects analysis was conducted. A two-sided P value of <0.05 was considered statistically significant, consistent with standard biomedical research conventions (Field, 2018).

C. Results and Discussion

Analysis of General Demographic Data

Following a rigorous screening process based on inclusion and exclusion criteria, this study ultimately enrolled 200 subjects meeting the research requirements. Participants were randomly and equally allocated to an experimental group (n=100) and a control group (n=100). Independent-samples t-tests were used to compare the general demographic characteristics between the two groups. Results indicated no significant differences between groups in age (experimental group: 35.28 ± 9.164 years; control group: 34.63 ± 9.657 years; $t = 0.488$, $p = 0.626$), educational attainment (experimental group: 2.80 ± 1.271; control group: 2.83 ± 1.215; $t = -0.171$, $p=0.865$), marital status (experimental group: 1.86±0.620; control group: 1.82±0.672; $t=0.437$, $p=0.662$), disease duration (experimental group: 2.58±1.065; control group: 2.51±0.959; $t=0.488$, $p=0.626$) and symptom severity (experimental group: 2.66±0.819; control group: 2.77±0.886; $t=-0.912$, $p=0.363$). This finding indicates that the experimental and control groups exhibited good demographic balance, providing a reliable baseline comparability for subsequent comparative analysis of intervention effects.

Comparison of Baseline Data Between Two Samples

Assessment of baseline clinical characteristics in 200 subjects revealed no statistically significant differences between the experimental group (n=100) and control group (n=100) across all symptom metrics. The pruritus symptom score was 2.95 ± 0.609 in the experimental group and 3.03 ± 0.643 in the control group ($t = -0.903$, $p = 0.367$); The itch intensity scores were 2.09 ± 0.404 and 2.11 ± 0.510, respectively ($t = −0.307$, $p = 0.759$). Regarding clinical manifestations: erythema scores were 2.32 ± 0.469 in the experimental group and 2.36 ± 0.503 in the control group ($t = −0.582$, $p = 0.561$); vulvar excoriations and fissures (experimental group 1.47 ± 0.502; control group 1.44 ± 0.499; $t = 0.424$, $p = 0.672$) and discharge volume (experimental group 2.56 ± 0.499; control group 2.62±0.508; $t=-0.843$, $p=0.400$) demonstrated

consistency between groups. Disease recurrence frequency indicators also showed a balanced distribution (experimental group: 2.03±0.332; control group: 2.00±0.318; t=0.653, p=0.515). Independent-samples t-tests confirmed that all observed indicators failed to reach statistical significance prior to the intervention (p>0.05), indicating sufficient clinical comparability between groups regarding initial symptom and sign status.

Comparative Analysis of Symptoms Before, During, and After Treatment Across Two Groups of Subjects

Presents results from repeated measures ANOVA comparing itching symptoms across three phases (baseline, mid-treatment, post-treatment) for both groups. Analysis revealed a significant main effect of time ($F=133.342$, $p<0.001$, $\eta^2=0.402$), indicating an overall improvement trend in pruritus symptoms across measurement points. A significant main effect of group was also observed ($F=11.368$, $p=0.001$, $\eta^2=0.054$), suggesting the intervention positively influenced symptom improvement. A significant interaction effect between time and group was observed ($F=8.891$, $p<0.001$, $\eta^2=0.043$), indicating that the pattern of intervention effects varied between groups over time.

Simple effects analysis revealed that the experimental group's mid-term (2.68 ± 0.618) and late-term (2.25 ± 0.520) scores were significantly lower than the control group's corresponding scores (mid-term: 2.99 ± 0.689; late-term: 2.61 ± 0.490) (both $p < 0.05$). Intra-group comparisons within the experimental group showed that mid-term and late-term scores were significantly lower than baseline (2.95 ± 0.609) (both $p < 0.05$), with late-term scores further decreasing compared to mid-term ($p < 0.05$). In the control group, only late-term scores showed significant reductions relative to baseline and mid-term ($p < 0.05$). Results indicate that the intervention sustained improvement in pruritus symptoms with increasing efficacy over time, whereas the control group demonstrated limited improvement.

Dynamic analysis of marginal mean estimates based on pruritus symptoms reveals: during the baseline period, symptom levels in the control and experimental groups were comparable; progressing to the mid-term phase, the control group largely maintained its original level while the experimental group demonstrated significant reduction; by the late phase, the control group exhibited limited relief, whereas the experimental group showed accelerated improvement. This pattern of change reveals a fundamental difference in therapeutic efficacy between the two groups. Specifically, the control group exhibited only mild symptom relief in the late phase, whereas the experimental group demonstrated sustained improvement commencing in the mid-phase. The bar chart clearly illustrates the temporal efficacy and cumulative effect of the intervention—the experimental group achieved a significant advantage in symptom control from the mid-treatment phase onwards, with this advantage progressively widening over time.

Presents results from repeated-measures ANOVA comparing itch severity across three stages (baseline, mid-term, post-treatment) for both participant groups. Analysis revealed a significant main effect of time ($F=67.548$, $p<0.001$, $\eta^2=0.254$), indicating an overall improvement in itch severity across measurement points. A significant main effect of group was also observed ($F=12.168$, $p=0.001$, $\eta^2=0.058$), suggesting the intervention positively influenced symptom improvement. A significant interaction effect between time and group was observed ($F=11.469$, $p=0.001$, $\eta^2=0.055$), indicating that the pattern of intervention effects varied between groups over time.

Simple effects analysis revealed that the experimental group scored significantly lower than the control group at both the mid-term (1.94 ± 0.343) and late-term (1.59 ± 0.494) assessments (mid-term: 2.09 ± 0.429; late-term: 1.91 ± 0.288) (all $p < 0.05$). Intra-group comparisons within the experimental group showed that scores at both the mid-term (1.94 ± 0.343) and late-term

(1.59 ± 0.494) assessments were significantly lower than at baseline (2.09 ± 0.404) (both $p < 0.05$), with late-term scores further decreasing compared to mid-term ($p < 0.05$). In the control group, only late-term scores decreased significantly from baseline ($p < 0.05$), with no change at mid-term. Results indicate that the intervention sustained improvements in itch severity over time, with effects increasing progressively, whereas improvements in the control group were limited and delayed.

Dynamic analysis of marginal mean estimates based on pruritus symptoms reveals: during the baseline period, pruritus severity levels were comparable between the control and experimental groups; progressing to the mid-term phase, the control group largely maintained its original level while the experimental group demonstrated a significant decline; by the late phase, the control group exhibited limited relief, whereas the experimental group showed accelerated improvement. This pattern of change reveals the fundamental difference in therapeutic efficacy between the two groups. Specifically, the control group experienced only mild symptom relief in the late phase, whereas the experimental group demonstrated sustained improvement from the mid-phase onward. The bar chart clearly illustrates the timeliness and cumulative efficacy of the intervention—the experimental group achieved a significant advantage in itch control from the mid-treatment phase, with this advantage progressively widening over time.

Presents results from repeated measures ANOVA comparing redness and swelling across three stages (baseline, mid-term, and post-treatment) for both participant groups. Analysis revealed a significant main effect of time ($F=74.936$, $p<0.001$, $\eta^2=0.275$), indicating an overall improvement trend in redness and swelling across measurement points. A significant main effect of group was also observed ($F=8.145$, $p=0.005$, $\eta^2=0.040$), suggesting the intervention positively influenced symptom improvement. A significant interaction effect between time and group was observed ($F=3.022$, $p=0.050$, $\eta^2=0.015$), indicating that the pattern of intervention effects varied between groups over time.

Simple effects analysis revealed that the experimental group's mid-term (2.04 ± 0.346) and late-term (1.86 ± 0.349) scores were significantly lower than the control group's corresponding scores (mid-term: 2.25 ± 0.500; late-term: 1.97 ± 0.223) (both $p < 0.05$). Intra-group comparisons within the experimental group showed that scores at both the mid-term (2.04 ± 0.346) and late-term (1.86 ± 0.349) assessments were significantly lower than at baseline (2.32 ± 0.469) (both $p < 0.05$), with late-term scores further decreasing compared to mid-term ($p < 0.05$). In the control group, only late-term scores showed significant reductions relative to baseline and mid-term (both $p < 0.05$), with no change observed at mid-term. Results indicate that the intervention sustained improvements in erythema and oedema, with effects increasing over time, whereas improvements in the control group were limited and concentrated in the late phase.

Dynamic analysis of marginal mean estimation based on erythema and oedema reveals that, during the baseline period, erythema and oedema levels were comparable between the control and experimental groups. In the mid-term phase, the control group largely maintained its baseline levels, whereas the experimental group showed a significant reduction. By the late phase, the control group demonstrated limited improvement, while the experimental group showed accelerated recovery. This pattern of change reveals the fundamental difference in therapeutic efficacy between the two groups. Specifically, the control group exhibited only a mild reduction in erythema and oedema during the late phase, whereas the experimental group demonstrated sustained improvement from the mid-phase onward. The bar chart clearly illustrates the temporal efficacy and cumulative enhancement of the intervention—the experimental group achieved a significant advantage in controlling erythema and oedema from the mid-treatment phase onwards, with this advantage progressively widening over time.

Presents results from repeated-measures ANOVA comparing vulval scratches and fissures across three stages (baseline, mid-term, post-treatment) for both participant groups. Analysis revealed a significant main effect of time ($F=68.573$, $p<0.001$, $\eta^2=0.257$), indicating an overall improvement trend in vulvar scratching and fissures across measurement points. A significant main effect of group was also observed ($F=5.039$, $p=0.026$, $\eta^2=0.025$), suggesting the intervention positively influenced symptom improvement. A significant interaction effect between time and group was observed ($F=9.845$, $p<0.001$, $\eta^2=0.047$), indicating that the pattern of intervention effects varied between groups over time.

Simple effects analysis revealed that the experimental group's mid-term (1.16 ± 0.368) and late-term (1.04 ± 0.197) scores were significantly lower than the control group's corresponding scores (mid-term: 1.35 ± 0.479; late-term: 1.22 ± 0.416) (both $p < 0.05$). Intra-group comparisons within the experimental group showed that scores at both the mid-term (1.16 ± 0.368) and late-term (1.04 ± 0.197) assessments were significantly lower than at baseline (1.47 ± 0.502) (both $p < 0.05$), with late-term scores further decreasing compared to mid-term ($p < 0.05$). In the control group, only late-term scores showed significant reductions relative to baseline and mid-term (both $p < 0.05$), with no change observed at mid-term. Results indicate that the intervention sustained improvements in vulvar scratching and fissures, with effects increasing over time, whereas improvements in the control group were limited and concentrated in the late phase.

Dynamic analysis of marginal mean values estimated from vulvar scratching and fissures revealed that during the baseline period, vulvar scratching and fissure conditions were comparable between the control and experimental groups. In the mid-term phase, the control group largely maintained its original levels, whereas the experimental group showed a significant decline. By the late phase, the control group exhibited limited relief, while the experimental group showed accelerated improvement. This pattern of change reveals the fundamental difference in therapeutic efficacy between the two groups. Specifically, the control group only experienced mild alleviation of vulvar scratching and fissures in the late phase, whereas the experimental group demonstrated sustained improvement from the mid-phase onwards. The bar chart clearly illustrates the timeliness and enhanced efficacy of the intervention—the experimental group achieved a significant advantage in controlling vulvar scratching and fissures from the mid-treatment phase, with this advantage progressively widening over time.

Results indicate that repeated measures analysis of variance was employed to compare secretion volumes across three phases (baseline, mid-term, and post-treatment) for both groups of subjects. Analysis revealed a significant main effect of time ($F=106.775$, $p<0.001$, $\eta^2=0.350$), indicating a decreasing trend in secretion volume across measurement periods. A significant main effect of group was also observed ($F=16.876$, $p<0.001$, $\eta^2=0.350$), indicating that secretion volume decreased progressively over time. $p<0.001$, $\eta^2=0.350$), indicating an overall decreasing trend in secretion volume across measurement time points. A significant main effect of group was observed ($F=16.876$, $p<0.001$, $\eta^2=0.079$), suggesting the intervention positively influenced symptom improvement. A significant interaction effect between time and group was also found ($F=12.741$, $p<0.001$, $\eta^2=0.060$), indicating that the pattern of intergroup differences in intervention effects varied over time.

Simple effects analysis revealed that the experimental group's scores at both the mid-term (2.11 ± 0.373) and late-term (1.94 ± 0.278) assessments were significantly lower than those of the control group at corresponding time points (mid-term: 2.510 ± 0.366, late: 2.06 ± 0.422) (both $p < 0.05$). Within the experimental group, scores at both the mid-term and late stages showed significant decreases compared to the baseline period (2.56 ± 0.499) (both $p < 0.05$), with the late-stage score further decreasing from the mid-term ($p < 0.05$). In the control group, only late-

stage scores showed significant reductions compared to baseline and mid-stage (all $p<0.05$), with no change observed at mid-stage. Results indicate that the intervention measures can sustainably reduce secretion volume, with effects increasing over time, whereas improvements in the control group were limited and delayed.

Dynamic analysis of marginal mean changes based on secretion volume estimation reveals: during the baseline period, secretion volumes in the control and experimental groups were comparable; progressing to the mid-term phase, the control group largely maintained its original level whilst the experimental group exhibited a marked decrease; by the late phase, the control group demonstrated limited improvement, whereas the experimental group showed accelerated enhancement. This pattern of change reveals the fundamental difference in therapeutic efficacy between the two groups. Specifically, the control group exhibited only a slight reduction in secretion volume during the late phase, whereas the experimental group demonstrated sustained improvement from the mid-phase onward. The bar chart clearly illustrates the temporal efficacy and cumulative enhancement of the intervention—the experimental group achieved a significant advantage in secretion volume control from the mid-treatment phase onwards, with this advantage progressively widening over time.

Presents results from repeated measures ANOVA comparing symptom recurrence across three phases (baseline, mid-intervention, post-intervention) in both groups. Analysis revealed a significant main effect of time ($F=39.382$, $p<0.001$; $\eta^2=0.166$), indicating a downward trend in symptom recurrence frequency across measurement periods. A significant main effect of group was also observed ($F = 12.368$, $p = 0.000000$; $\eta^2 = 0.166$). $p<0.001$, $\eta^2=0.166$), indicating an overall downward trend in symptom recurrence frequency across measurement points. A significant main effect of group was observed ($F=12.368$, $p=0.001$, $\eta^2=0.059$), suggesting the intervention positively influenced recurrence control. A significant interaction effect between time and group was also found ($F=11.240$, $p<0.001$, $\eta^2=0.054$), indicating that the pattern of intervention effects over time differed between groups.

Simple effects analysis revealed that the experimental group scored significantly lower than the control group at both the mid-term (1.78 ± 0.416) and late-term (1.61 ± 0.490) assessments (mid-term: 1.94 ± 0.239, late: 1.87 ± 0.338) (both $p < 0.05$). Within the experimental group, scores at both mid-term and late-term were significantly lower than at baseline (2.03 ± 0.332) (both $p < 0.05$), with late-term scores further decreasing compared to mid-term ($p < 0.05$). In the control group, only late-stage scores showed significant reductions compared to baseline and mid-stage (all $p<0.05$), with no change observed at mid-stage. Results indicate that the intervention sustained a reduction in symptom recurrence frequency, with effects increasing over time, whereas improvements in the control group were limited and concentrated in the late stage.

Dynamic analysis of marginal mean estimates based on symptom recurrence reveals that, during the baseline period, symptom recurrence rates were comparable between the control and experimental groups. In the mid-term phase, the control group largely maintained its original level, whereas the experimental group showed a significant decline. By the late phase, the control group exhibited limited remission, while the experimental group showed accelerated improvement. This pattern of change reveals a fundamental difference in therapeutic efficacy between the two groups. Specifically, symptom recurrence in the control group decreased only in the late phase, whereas the experimental group demonstrated sustained improvement commencing in the mid-phase. The bar chart clearly illustrates the temporal efficacy and cumulative effect of the intervention—the experimental group exhibited a significant advantage in symptom recurrence control from the mid-treatment phase onwards, with this advantage progressively widening over time.

Vulvovaginal candidiasis (VVC) is one of the most prevalent infectious diseases affecting the female reproductive system, particularly among women of childbearing age between 20 and 50 years old. Epidemiological studies indicate that VVC accounts for approximately 20–40% of all cases of vaginitis worldwide (Sobel, 2016). The condition is predominantly caused by Candida albicans, which remains the most frequently isolated pathogen in uncomplicated VVC cases (Pappas et al., 2016). Clinically, VVC presents with non-specific but highly distressing symptoms, including vaginal itching, burning sensations, dyspareunia, dysuria, and abnormal vaginal discharge. Due to its recurrent nature, VVC often exerts a substantial psychological burden on patients, leading to anxiety, reduced work productivity, impaired social functioning, and diminished quality of life (Mendling et al., 2015).

The recurrent form of VVC, defined as four or more episodes within a one-year period, represents a significant clinical challenge. Without appropriate and sustained intervention, recurrent VVC may negatively affect reproductive health and has been associated with an increased risk of infertility and long-term gynecological complications (Denning et al., 2018). In recent years, the incidence of VVC has continued to rise, driven by factors such as lifestyle changes, widespread antibiotic misuse, hormonal fluctuations, and compromised immune function (Yano et al., 2019). These trends highlight the urgency of developing more effective and sustainable management strategies.

Current clinical management of VVC primarily focuses on antifungal pharmacotherapy combined with general behavioural guidance and immune regulation (Workowski & Bolan, 2015). Although antifungal drugs are effective in relieving symptoms in the short term, their long-term efficacy remains limited due to high recurrence rates and increasing concerns regarding antifungal resistance (Pappas et al., 2016). Moreover, behavioural interventions are often delivered through generic health education sessions that lack personalisation, continuity, and patient engagement, thereby limiting their effectiveness in promoting sustained behavioural change (Glanz et al., 2015).

Health education, when implemented as a structured, systematic intervention, has been shown to enhance disease awareness, improve self-management skills, and promote healthy behavioural practices. However, traditional health education models frequently rely on brief verbal instructions and monotonous delivery formats, which restrict patient retention and long-term impact (Glanz et al., 2015). To address these limitations, the concept of a health education prescription has emerged as an innovative approach. This model provides written, standardised, and individualised educational guidance tailored to patients' specific characteristics and disease stages, allowing repeated consultation and prolonged educational exposure (Chen et al., 2021).

Empirical evidence suggests that health education prescriptions significantly improve patients' health literacy, medication adherence, and correct implementation of therapeutic recommendations (Nutbeam, 2008). Furthermore, digital health education prescriptions have been shown to enhance the efficiency of clinician-led education while delivering professional, disease-specific, and personalised guidance to patients (Hu et al., 2020). Studies focusing on VVC have demonstrated that systematic health education interventions effectively improve treatment outcomes and reduce recurrence rates, underscoring their clinical value and scalability (Zhu, 2019).

Based on these considerations, the present study adopts a randomised controlled design to compare conventional antifungal treatment alone with conventional treatment combined with a health education prescription intervention. The findings indicate that both interventions effectively reduce symptom and sign scores; however, patients receiving the combined intervention demonstrate significantly greater improvements and lower recurrence rates. These outcomes may be attributed to enhanced disease cognition, improved medication adherence, and

sustained behavioural modification, facilitated by written, repeatable educational guidance (Bandura, 1997; Osterberg & Blaschke, 2005). By correcting high-risk behaviours and reinforcing healthy practices, health education prescriptions help maintain vaginal microbiome balance and synergise with pharmacological therapy, thereby establishing a virtuous cycle of improved adherence, therapeutic efficacy, and long-term disease control (Reid & Burton, 2002).

D. Conclusion

The findings of this study demonstrate that integrating health education prescription interventions with conventional antifungal pharmacotherapy yields significant clinical and behavioural benefits for patients with vulvovaginal candidiasis. Compared with drug therapy alone, this combined approach markedly enhances patients' disease-related knowledge, promotes sustained treatment adherence, and facilitates the adoption of healthier lifestyle behaviours that are essential for long-term disease control. These improvements translate into more pronounced reductions in clinical symptom and sign scores, as well as a significantly lower recurrence rate over the intervention period.

The superiority of this comprehensive management strategy can be attributed to the structured, individualised, and repeatable nature of health education prescriptions, which extend the duration and depth of patient education beyond routine verbal instruction. By reinforcing key information regarding disease mechanisms, medication use, and behavioural risk factors, health education prescriptions empower patients to actively participate in their own care, thereby strengthening the effectiveness of pharmacological treatment. Moreover, the sustained behavioural modification achieved through this intervention contributes to maintaining vaginal microecological balance, which is critical in preventing disease relapse.

From a clinical perspective, these findings underscore the value of incorporating health education prescriptions as a standard adjunct to routine VVC management, particularly for patients at high risk of recurrence. From a research standpoint, further multicentre studies with longer follow-up periods are warranted to evaluate the long-term sustainability, cost-effectiveness, and broader applicability of this intervention across diverse populations. Overall, health education prescription–based interventions represent a feasible, effective, and scalable strategy for optimising the comprehensive management of vulvovaginal candidiasis.

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