Effect of Education Program-Based on Common Sense Model of Self-Regulation on Self-Management for Patients with Helicobacter Pylori Infection

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Abstract

Background: Helicobacter Pylori remains a serious public health problem, impacts over half of the world's population. The common sense model of self-regulation is a more effective educational model for self-management for Helicobacter Pylori infection progression. **Aim**: Evaluate the effect of educational program-based on common sense model of self-regulation on self-management of patients with helicobacter pylori infection. **Design:** A quasi-experimental design was employed in the present study. **Setting:** The study was conducted in internal medicine outpatient clinic at a governmental hospital affiliated to Suez University Hospital, Ismailia, Egypt. **Sample**: One hundred adult helicobacter pylori patients were divided into intervention and control groups (50 patients in each group). **Methods:** Researchers used two study tools to collect data for this study. The first tool was a structured interview questionnaire, which included two parts: Part I gathered personal and medical data, while Part II assessed the patient's knowledge about H. pylori infection. The second tool was a self-management questionnaire designed to evaluate patients' self-management. The researchers implemented an education program based on CSM in three sessions conducted over 10 weeks. **Results** The study group showed significant improvements in all parameters ($P < 0.001$), (self-integration (mean increase from 15.92 to 41.78, self-regulation (mean increase from 12.68 to 31.40, interactions with others (mean increase from 12.02 to 31.04, and adherence to the therapeutic regimen (mean increase from 6.84 to 18.64. The study group's overall self-management score rose significantly from 53.00 to 137.54 compared to the control group. The study group's mean knowledge score increased significantly to 4.22 ± 0.84, whereas the control group's score remained nearly unchanged at 1.02 ± 0.51 ($t = 22.97$, $P < 0.001$, effect size $\delta = 6.22$) compared to the control group. **Conclusion**: There was a statistically significant improvement in knowledge and self-management in the study group compared with the control group after implementation of education program-based on self-regulation common sense model. **Recommendation:** Education program-based on self regulation common sense model should be conducted for helicobacter pylori patients as they are the key to improve self-management.

Key words: Common Sense Model of Self-Regulation, Helicobacter Pylori infection, educational program.

Introduction:

Helicobacter pylorus (H. pylori) is now the most widespread bacterial infection that mostly invades the lining of the human's stomach. It infects nearly 50% of the world's population primarily in developing countries and is considered the most causative pathogen for upper gastrointestinal illness including peptic ulcer, chronic gastritis, and gastric cancer, and presents a substantial concern due to its association with gastric cancer, which is the third leading cause of cancer-related deaths worldwide. **(Aljohani, 2021 & Ali & AlHussaini, 2024)**.

The prevalence rate of H. pylori fluctuates widely among various geographical areas between (85% -and 95%) in developing countries and declined to (30 - 50%) in developed countries based on living conditions, personal hygiene, sanitation facilities, and successful eradication health practices **(Mohammed, et al., 2020)**. In Egypt, The

prevalence of H. pylori in Egypt ranges from (13% - 90.9%) depending on the studied population and the year of publication. The prevalence in adults from 26.2-90.9%. The average prevalence in the adult population is about 67% and the average prevalence in the whole population is about 62.5% **(Alboraie, 2023).**

Several studies explain the complexity of H. pylori infection in the population including; the manifestations of H. pylori infection are symptomatic, however, Once infected, there are many gastro-duodenal consequences, including gastritis, gastric ulcer, duodenal ulcer, dyspeptic symptoms, and stomach cancer. Furthermore, several studies have suggested an association between H. pylori infection and certain other extra-gastric complications such as ischemic heart disease, neurodegenerative diseases, and hematological disorders (iron deficiency anemia, immune thrombocytopenic purpura, and vitamin B12 deficiency **(Ansari & Yamaoka, 2018; Elbehiry et al., 2023 & Malfertheiner et al., 2023)**. So, **Yang et al., (2023)**pointed out that effective self-management leading to the eradication of H. pylori is essential to prevent harmful outcomes. By taking proactive measures and adhering to treatment plans, patients can significantly reduce the risk of complications associated with H. pylori infections. Therefore, encouraging patients with H. pylori to actively participate in their disease care enhances their self-management abilities.

Self-management is critical for patients to provide adequate care for diseased patients. The main self-management components include symptom control, self-monitoring, self-integration, interaction with health professionals, self-regulation, and adherence to recommended therapeutic regimens **(Liu et al., 2024 & Niño de Guzmán Quispe, 2021)**. Research studies indicate that numerous Helicobacter pylori control programs have failed due to undefined goals, inadequate management of disease-related emotions, insufficient planning, and challenges in engaging patients in self-management Implementing the self-regulating Common-Sense Model (CSM) could potentially address these issues by helping patients recognize health threats, develop effective interventions, and improve disease perception, thereby enhancing self-management practices and improving model outcomes **(Addissouky et al., 2023; Hagger & Orbell, 2022 & Rogers & Révész, 2020).**

The self-regulating Common-Sense Model (CSM) is effective in managing diseases by helping patients identify health threats and develop interventions to reduce their disease burden through improved disease perception. The model suggests that stimuli activate perceptions of current or future health threats, leading individuals to generate cognitive and emotional responses. These responses prompt behavioral actions, resulting in various health outcomes. The CSM has been applied to patients with chronic diseases, heart disease, diabetes, mental illness, and post-surgery conditions. It influences patients' psychology and cognition, enhances health behaviors such as self-management, and improves health outcomes, including quality of life, reduced depression, and better physical function. Moreover, the application of this model for patients with H pylori infections **(Breland et al., 2020; Gu et al., 2024 & Lee et al., 2023).**

Nurses play a critical role in enhancing self-management among patients with H Pylori. As the CSM model is an evidence-based approach implemented to achieve self-management, this model provides a valuable framework for executing self-management interventions. CSM model enables nurses to integrate self-management activities such as proper diet, exercise, weight control, self-monitoring and symptoms management, collaboration with health care providers, and adherence to recommended therapeutic and stress management to promote self-management abilities **(El-maghawry et al., 2022; Otter et al., 2023 & Yang et al., 2024)**. Therefore, this approach helps patients recognize health threats and develop effective strategies to manage their condition, reflecting the practical application of the CSM in improving self-management among patients with H Pylori.

Aim of the study:

This study aimed to evaluate the effect of educational program-based on common sense model of self-regulation on self-management of patients with helicobacter pylori infection through:

1.Assessing self-management of patients with Helicobacter pylori

2.Implementing educational program based on common sense model of self-regulation on self-management of patients with Helicobacter pylori infection.

3.Evaluating the effect of educational program based on the common sense model of self-regulation on self-management of patients with Helicobacter pylori infection.

Research Hypotheses:

H0: There is no a significant improvement in self-management of patients with Helicobacter pylori infection after implementation an education program-based on common sense model of self-regulation.

H1: There is a significant improvement in the self-management of patients with helicobacter pylori infection after the implementation an educational program based on common sense model of self-regulation.

Methods

Research design:

A quasi-experimental pre-test post-test control group design. The quasi-experimental research design involved manipulating the independent variable to observe the impact on the dependent variable. The outcomes of the pre-test and post-test helped establish the effectiveness of the intervention measures proposed in the research **(Polit & Beck, 2017)**.

Setting:

The study was carried out in the internal medicine outpatient clinics at Suez Canal University Hospital, which are located on the right side of the first floor of the hospital buildings and are divided into four rooms: three internal medicine outpatient clinics and a lecture room, one for male patients and one for female patients.

Sampling technique and sample size:

A convenience sample of patients with H Pylori infection aged ≥ 18 years old of both sex, diagnosed with H. pylori infection by positive stool antigen test, in addition, to being able to communicate and agree to participate in the study. Patients with psychiatric, mental diseases, coma, and communication disorders were excluded from the study.

In the study conducted by **Wang et al., (2020),** the sample size (n) was determined based on the formula $n=2\ (Z\alpha/2+Z\beta)*\sigma)^{2} / (\mu1 -\mu2)^{2}$ to be 50 for each group, resulting in 50 participants in the control group and 50 participants in the study group. The study aimed to compare the mean values of self-management variables between these two groups. The standard deviation (σ) for the variable was 4.28. The means for the control group (μ1) and the study group (μ2) were 35.54 and 36.62, respectively. The Z-values used for statistical calculations were $Z\alpha/2 = 1.96$ and $Z\beta = 0.84$ **(Dawson, 2004)**.

Tools of Data Collection and Scoring System:

Two study tools were used by researchers to collect the data for this study. **First tool**: A structured interview questionnaire was developed by the researchers after reviewing recent related literature **(Mohammed et al., 2020, Zha et al., 2022 & Hafiz et al., 2023)**. It included two parts.

Part I: **Personal and medical data form** cover demographic data including; age, gender, level of education, marital status, income and residence. The medical data included; time since diagnosis, body mass index, smoking history, and comorbidity.

Part II: The patient's knowledge about H. pylori infection: Consisted of main 5 items, covering topics like (definition, incidence, mode of transmission, clinical manifestation, and prevention and management of H. pylori infection.

Scoring system for part II: Each correct answer was given a score of one and the wrong item was given a score of zero. Regarding total knowledge score a higher total score indicates a higher level of knowledge.

Second tool: **Self-management questionnaire tool:**

A modified version of the self-management questionnaire of patients with H. pylori infection was designed by **Lin et al., (2008).** This questionnaire consisted of 40 items addressing different aspects of self-management for the illness. These included:self-integration (13 items) ; interaction with the health professionals and significant others (9 items); self-regulation (9 items);self-monitoring (4 items) ; and adherence to recommended regimen (5 items). The patients were asked to rate each item to indicate the frequency which they performed the self-management practice. Items were scored on a 4-point scale ranging from 1(never) to 4 (always). The total self-management score ranged from 40 scores to 160 scores. A higher score indicates high self-management.

Validity and Reliability:

A panel of five nursing faculty staff from Suez Canal University established face and content validity for all study tools. First, the experts were asked to evaluate the tools' content coverage, clarity, phrasing, length, format, and overall appearance. Some changes were made based on the expert panel's feedback, which was tested on a 5-point Likert scale with a content validity score of 0.852, and the final frame was created. Furthermore, the reliability of the second study tool was statistically validated using Cronbach's alpha to check internal consistency and estimate the coefficient of reliability of the evaluation tool, which was 0.792.

The pilot study:

It was conducted on a subset of 10% of the entire study population to assess the tools' clarity and practicality. The necessary changes were done based on the findings of the pilot research. The pilot participants were excluded.

Ethical consideration:

Before recruitment and data collection, the Faculty of Nursing's Research Ethics Committee approved the proposal (233:8/2023), and each subject provided written consent after being informed about its nature, purpose, and advantages. Subjects were also notified that participation is optional and that they can withdraw at any time without explanation. The confidentiality of any obtained information was protected by coding all data. The researchers told the subjects that the data would be utilized only for research purposes.

Procedure of data collection:

The data collection period lasted 8 months, from the beginning of September 2023 to the end of May 2024, and took place three days per week during the morning shift (9.00 a.m. to 2.00 p.m.). The self-regulation concept was implemented in four phases: assessment, planning, implementation, and evaluation.

Assessment phase: The researchers introduced themselves to the patient at the beginning of the interview and discussed the study's aim. Two tools were applied to assess patient profile, knowledge, and self-management, for the control and intervention group of patients. Before the application of the Common Sense self-regulation model to collect baseline data using tools I, II (pretest was done).

Planning phase: In this phase, the researchers used CSM to construct the needed information to manage Helicobacter pylori infection, and the contents were written in basic Arabic to guide the patients based on a review of the literature **(Beaudin et al., 2020; Breland et al., 2020; Hafiz et al., 2023 & Lazar, 2024)**. Educational Program-Based on Common Sense Model of Self-Regulation on Self-Management was developed and constructed according to patients' needs and was based on self-management. After completing the initial setup, the Educational Program-Based on Common Sense Model of Self-Regulation were revised by a group of three experts from the professors of medical-surgical nursing. Different methods were used, including video, group discussion, and PowerPoint presentations, along with written materials. .

Implementation phase: The application of education program based on CSM was implemented by the researchers in three sessions conducted in 10 weeks. The duration of each session is 45 to 50 minutes. Then researchers collected the patients of the intervention group of each day (5 Patients per day through three days weekly) at the lecture room of medical outpatient clinics to provide a single education program session based on CSM as follow***s: The first session*** focused on increasing patients' awareness about H. pylori infection definition, incidence, mode of transmission, clinical manifestation, and prevention and management of H. pylori infection. ***Second session***: Focused on self-monitoring, symptom management, and stress management. Enhancing cognitive representation of patients for their problems through interaction with health care providers and others.

The third session: Focused on assisting patients in making decisions about their treatment plan and how to modify their lifestyles by providing healthy choices such as a healthy proper diet, a balance of rest and activity, maintaining a regular sleep schedule, recommended exercise, weight control, personal hygiene, follow-up, and adherence to therapeutic regimen. This session identified skills and approaches for improving self-regulation, such as regulating negative emotions and managing emotion regulation, carrying out plans and monitoring performance, developing cognitive appraisals to assess coping and changing strategies as needed.

Evaluation phase:

During the evaluation phase, the effect education program based on CSM on H pylori patients' self-management with was evaluated by comparing the posttest 2 months after implementing education program based on CSM for the study group and control group and using the same two tools of the pretest.

Data analysis:

The following statistical analyses were performed using SPSS 27 software: the Kolmogorov-Smirnov test to determine data normality, the paired and independent t-tests to compare mean values between two groups, and the chi-square test to examine the association between categorical variables. Cohen's d effect size (d) was used to compare the control and study groups at each time point. A p-value of 0.05 or less indicated statistical significance.

Results

Table 1 shows the demographics of the study and control groups, each with 50 participants. The age distribution is comparable, with mean ages of 35.66 ± 10.38 and 36.38 ± 10.05 years, respectively (P =.725). The gender distribution is nearly equal, with 52% of men in the study group and 48% in the control group (P =.689). Education levels show a higher number of illiterates in the control group (20% vs. 6%), but there is no significant difference overall (P =.094). Marital status and income distributions are likewise similar, with the study group having a slightly higher percentage of married individuals (68% vs. 52%) and those with insufficient income (74% vs. 56%) (P =.323 and P =.089, respectively). Residence statistics show that the study group has more urban members (64% vs. 54%), but there is no significant difference (P =.069).

Table 2 depicts the history data of the study and control groups, each with 50 participants. Weight distribution reveals that both groups have an equal percentage of participants with normal weight (58%), and similar distributions in other categories: underweight (18% study, 10% control), overweight (16% study, 20% control), and obese (8% study, 12% control), with no significant difference (P =.623). Time since diagnosis is also comparable, with the majority diagnosed within the last year (36% study, 32% control), and similar distributions in other periods (P =.828). Comorbidity is the same in both groups, with 30% having comorbidities. Diabetes mellitus (16% study, 18% control), hypertension (18% study, 12% control), and chronic kidney disease (4% study, 2% control) were not significantly different among those with comorbidities (P =.790, .401, and.558, respectively). Smoking behaviors vary little, with 76% in the study group never smoking compared to 2% in the control group, and 22%

continuing to smoke in the study group versus 14% in the control group (P =.870).

Table 3 compares the knowledge scores of the study and control groups before and after intervention. Pre-intervention, both study and control groups had equal mean knowledge scores (1.12 ± 0.69 and 1.06 ± 0.65, respectively) with no significant difference (t = 0.308, P = 0.759, effect size δ = 0.06). After the intervention, the study group's mean knowledge score increased significantly to 4.22 ± 0.84, whereas the control group's score remained nearly unchanged at 1.02 ± 0.51 (t = 22.97, P < 0.001, effect size δ = 6.22). The study group improved significantly from pre- to post-intervention (t = 24.03, P < 0.001, effect size d = 3.40), while the control group did not exhibit any significant difference (t = 0.375, P = 0.709, effect size d = 0.05).

Table 4 shows significant differences in self-management before and after intervention within the study group, as well as between the study and control groups post-intervention. The study group showed significant improvements in self-integration (mean increase from 15.92 to 41.78, P < 0.001), self-regulation (mean increase from 12.68 to 31.40, P < 0.001), interactions with others (mean increase from 12.02 to 31.04, P < 0.001), and adherence to the therapeutic regimen (mean increase from 6.84 to 18.64, P < 0.001). The study group's overall self-management score raised dramatically from 53.00 to 137.54 (P < 0.001). In contrast, the control group exhibited no significant improvements in any domain before or after the intervention. The study group scored significantly higher in self-integration (41.78 vs. 16.42, P < 0.001), self-regulation (31.40 vs. 11.92, P < 0.001), interactions with others (31.04 vs. 12.24, P < 0.001), self-monitoring (14.68 vs. 5.80, P < 0.001), adherence to the therapeutic regimen (18.64 vs. 6.64, P < 0.001), and total self-management (137.54 vs.53.02) with P value <0.001***.** The results in this table confirm the study hypotheses H2.

Table (5) shows that gastrointestinal status scores showed improvement among the study group post intervention. The results in this table confirm the study hypotheses H3.

Table (1): Distribution of personal characteristics among the study and control groups

Items	Study group n= 50		Control group n=50		Test	P*
	N	%	N	%		
Age (years)						
20-	20	40.0	15	30.0	X^2 2.04	.563
30-	11	22.0	17	34.0		
40-	12	24.0	11	22.0		
50-	7	14.0	7	14.0		
Mean ±SD	35.66 ± 10.38		36.38 ± 10.05		.352#	.725
Gender						
Male	26	52.0	24	48.0	X^2 .160	.689
Female	24	48	26	52.0		
Education						
Illiterate	3	6.0	10	20.0	X^2 4.74	.094
Intermediate	22	44.0	16	32.0		
High	25	50.0	24	48.0		
Marital status						
Single	14	28.0	20	40.0	X^2 2.33	.323mc
Married	34	68.0	26	52.0		
Divorced	2	4.0	3	6.0		
widowed	0	0	1	2.0		
Income						
Enough	11	22.0	21	42.0	X^2 4.70	.089 mc
Not enough	37	74.0	28	56.0		
Enough saving	2	4.0	1	2.0		
Residence						
Urban	32	64.0	27	54.0	X^2 4.06	.069
Rural	29	58.0	23	46.0		

*X^2 is Pearson chi-square test; mc is Monte Carlo chi-square test; # is independent t test, **P** value is significant <. 05*

Table (2): Distribution of the study and control group regarding medical data.

Items	Study group n= 50		Control group n=50		Test X^2	P
	N	%	N	%		
Weight						
Normal	29	58.0	29	58.0	1.77	.623
Underweight	9	18.0	5	10.0		
Overweight	8	16.0	10	20.0		
Obese	4	8.0	6	12.0		
Time since diagnosis						
<1	18	36.0	16	32.0	.377	.828
1-	19	38.0	22	44.0		
3-	13	26.0	12	24.0		
Comorbidity						
Yes	15	30.0	15	30.0	Equal	Equal
No	35	70.0	35	70.0		
If yes*						
Diabetes mellitus	8	16.0	9	18.0	.071	.790
Hypertension	9	18.0	6	12.0	6.70	.401
Chronic kidney disease	2	4.0	1	2.0	.344	.558
Smoking						
Never	38	76.0	1	2.0	3.09	.870
Yes, but quiet know	1	2.0	42	84.0		
Continue to smoke	11	22.0	7	14.0		

*X^2 is Pearson chi-square test; Equal means equal proportion between two groups, and **the P** value is significant <. 05*

Table (3): Comparison of the groups regarding knowledge score pre and post-intervention in both study and control group

Outcome / Measure	Study	Control	$t^{\$}$, (Pvalue) (delta)
	Mean (SD)	Mean(SD)	
Total knowledge (0-5)			
Pre-intervention	1.12(.69)	1.06(.65)	.308(.759)(.06)
Post-intervention	4.22(.84)	1.02(.51)	22.97(<0.001*)(6.22)
$t^{\#}$, (Pvalue) (d2)	24.03(<0.001*)(3.40)	.375(.709)(.05)	

$t^{\$}$ is independent t test, $t^{\#}$ is paired sample t test , d is Cohen's effect size, delta is glass delta effect size, and P value is significant <.05

Table (4): Comparison of study participants regarding self-management and its domains in both study and control group (n=50)

Outcome / Measure	Study	Control	t$, (Pvalue) (delta)
	Mean (SD)	Mean(SD)	
Self-integration (13-52)			
Pre-intervention	15.92(3.30)	15.60(2.63)	.536(.593)(.1)
Post-intervention	41.78(5.40)	16.42(3.07)	28.88(<0.001*)(8.26)
t#, (Pvalue) (d2)	32.58(<0.001*)(4.61)	1.43(.159)(.2)	
Self-regulation (9-36)			
Pre-intervention	12.68(2.48)	12.67 (2.62)	.000(1.000)(.000)
Post-intervention	31.40(3.13)	11.92(2.29)	35.50(<0.001*)(8.50)
t#, (Pvalue) (d2)	34.68(<0.001*)(4.90)	1.79(.079)(.25)	
Interactions with others(9-36)			
Pre-intervention	12.02(2.28)	11.62(1.70)	.994(.393)(.19)
Post-intervention	31.04(2.78)	12.24(2.54)	32.24(<0.001*)(7.39)
t#, (Pvalue) (d2)	38.47(<0.001*)(5.44)	1.37(.176)(.19)	
Self-monitoring (4-16)			
Pre-intervention	5.54(1.31)	5.32(1.17)	.885(.373)(.17)
Post-intervention	14.68(1.28)	5.80(1.38)	33.24(<0.001*)(6.41)
t#, (Pvalue) (d2)	34.10(<0.001*)(4.82)	1.77(.082)(.25)	
Adherence to therapeutic regimen (5-20)			
Pre-intervention	6.84(1.54)	6.74(1.87)	.291(.771)(.06)
Post-intervention	18.64(1.71)	6.64(1.66)	35.56(<0.001*)(7.22)
t#, (Pvalue) (d2)	36.50(<0.001*)(5.16)	.280(.781)(.04)	
Total self- management (40-160)			
Pre-intervention	53.00(7.37)	51.96(6.26)	.761(.449)(.15)
Post-intervention	137.54(10.69)	53.02(7.31)	46.15(<0.001*)(11.56)
t#, (Pvalue) (d2)	46.13(<0.001*)(6.52)	854(.397)(.12)	

t$ is independent t test, t# is paired sample t test , d is Cohen's effect size, delta is glass delta effect size, and P value is significant <.05

Table (5): Comparison of study participants regarding physical assessment among both groups

Outcome / Measure	Study group (n=50)	Control group (n=50)	t$, (Pvalue) (delta)
	Mean (SD)	Mean (SD)	
Pre-intervention	5.54(1.31)	5.32(1.17)	.885(.373)(.17)
Post-intervention	14.68(1.28)	5.80(1.38)	33.24(<0.001*)(6.41)
t#, (Pvalue) (d2)	34.10(<0.001*)(4.82)	1.77(.082)(.25)	

t$ is independent t test, t# is paired sample t test , d is Cohen's effect size, delta is glass delta effect size, and P value is significant <.05

Discussion:

Self-management refers to the actions patients take to manage their health conditions with the help of healthcare experts. The efficacy of such self-management programs can have a major impact on patient compliance and health outcomes in Helicobacter pylori (H. pylori) infection. Several factors influence H. pylori treatment compliance, including treatment complexity and length, physician motivation, patient education, and effective medication regimens **(Rajabloo, et al., 2021).**

Numerous studies have shown that the Common-Sense Model (CSM) of Self-Regulation improves self-management among patients with chronic diseases. Patients' decisions when evaluating signs and symptoms are impacted by their perceptions and emotional characteristics. Patients' reactions can differ depending on their perception of the threat and origin of the symptoms, beliefs about potential repercussions, perceived severity of the condition, and expectations for treatment and symptom management **(McAndrew et al., 2018& Leventhal et al., 2016).** This approach is critical in understanding how people manage chronic illnesses, such as H. pylori infection.

Educational methods based on the CSM have demonstrated the ability for enhancing self-management. Given the complexities of chronic diseases and the factors that influence health behaviors, previous research has shown that CSM-based education can improve outcomes for a variety of chronic ailments **(Rajabloo, et al., 2021).** Moreover, CSM-based education programs have been demonstrated to directly improve affect and knowledge among patients with H. pylori infection **(Hafiz et al., 2023).**

On the same line, **Zha et al., (2022)** found that an enhanced patient education (EPE) program increased eradication rates and patient compliance, implying that such programs could be an effective complement to clinical treatment regimens. Furthermore, educational interventions have been shown to improve medication adherence, awareness, and practices regarding H. pylori infection and intrafamilial transmission among patients **(Mohammed, et al., 2020).** The application of health education has also been shown to improve self-care ability and reduce the rate of H. pylori infection in patients with peptic ulcer disease **(Wang, et al., 2020).**

In the same vein, Educational programs based on CSM have been effective in reducing the intensity of intestinal symptoms such as nausea and vomiting. Qualitative research indicates that CSM-based education interventions help patients understand their disease prognosis and evaluate coping mechanisms, improving their control and management **(Gu et al., 2024).** Emotion regulation also plays a significant role in managing health outcomes. Training based on the CSM has been found to reduce gastritis symptoms and improve self-management, including self-care, medication adherence, response to disease, self-monitoring, and self-regulation. This aligns with findings from other studies, which show that understanding the disease and its implications can lead to better self-control **(Yang et al., 2023).**

This reflects that patients with chronic diseases' acceptance of self-management guidelines is heavily influenced by their mental views about the disease. When confronted with a disease, patients derive their understanding of the issue from personal experiences, prior knowledge, and cultural variables, which influence their reactions. Self-regulation mechanisms modify the impact of external events, so establishing the foundation for internal behavioral control.

In the same context, in a study done by **Mohammed, et al., (2020)**, after the educational intervention, nearly three-quarters of the intervention group continued to use H. pylori eradication therapy, while only about one-third of the control group did. Additionally, the study group's overall knowledge and practices regarding H. pylori infection and its intrafamilial transmission improved significantly compared to before.

Similarly, **Wang et al. (2020)** found that the experimental group's self-care skills improved significantly after the intervention, while the level of social support, anxiety reduction, and self-efficacy were significantly higher than in the control group. The rate of H.

pylori infection in the experimental group was similarly significantly lower post-intervention than pre-intervention. These considerable changes highlight the critical role of CSM-based education in improving health outcomes.

Furthermore, **Gu et al. (2024)** found that educational programs based on CSM effectively reduced the intensity of intestinal symptoms such as nausea and vomiting. Participants in the intervention group experienced better control and management of their symptoms compared to those in the control group. Similarly, **Hafiz et al. (2023)** demonstrated that CSM-based education interventions directly enhanced effect and knowledge among patients with H. pylori infection, leading to improved self-management outcomes compared to the control group.

Finally, educational interventions based on the Common-Sense Model of Self-Regulation are effective in enhancing self-management among patients with H. pylori infection. These interventions improve patients' knowledge, medication adherence, self-care practices, and ability to manage symptoms, ultimately leading to better health outcomes. Nurses and healthcare professionals should incorporate CSM-based education along with medication to improve patient compliance and management of H. pylori infection.

Conclusion:

There was a statistically significant improvement in knowledge and self-management in the study group compared with the control group after implementation of education program-based on common sense model of self-regulation.

Recommendations:

Education program-based on common sense model of self-regulation should be conducted for helicobacter pylori patients as they are the key to improve self-management.

Further researches directed toward Education Program-Based on Common Sense Model of Self-Regulation for improving self-management for patients with other gastrointestinal disorder

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