

UNIVERSITI PUTRA MALAYSIA

EFFECTIVENESS OF AN EDUCATION INTERVENTION ON HEPATITIS C TREATMENT ADHERENCE AMONG LIBYAN PATIENTS IN A MEDICAL CENTER IN TRIPOLI

SAMIA IBRAHIM MOHAMED ADAM

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Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfillment of the Requirements for the Degree of Doctor of Philosophy

May 2018

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DEDICATION

This thesis dedicated to my parents, Mr. Ibrahim Mohamed Adam and Mrs. Mabaroka Mansour Hasan. To my husband, children, siblings, and friends. They all gave me continuous support and inspired me to be optimistic and successful.



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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

EFFECTIVENESS OF AN EDUCATION INTERVENTION ON HEPATITIS C TREATMENT ADHERENCE AMONG LIBYAN PATIENTS IN A MEDICAL CENTER IN TRIPOLI

By

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May 2018

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Hepatitis C infection is a communicable disease caused by hepatitis C virus (HCV). The standard treatment of HCV infection is a combination of Ribavirin (RBV) and Pegylated interferon (PegIFN) for six months or one year. The long duration and the side effects of dual treatment have an enormous impact on patients' treatment adherence and health-related quality of life (HRQL). This study aims to evaluate the effectiveness of an education intervention to improve treatment adherence as its primary outcome and to improve secondary outcomes including knowledge, general self-efficacy (GSE), virological response, physical components score (PCS), and mental components score (MCS) of HRQL.

A single-blind, randomized controlled trial was conducted among 103 patients in Tripoli Medical Center, Libya. The patients who were undergoing treatment with PegIFN and RBV randomly allocated by concealment block randomization, 51 patients to the intervention group and 52 patients to the control group. The intervention group received educational material consisted of a one-day session of PowerPoint presentation, booklet, discussion, and demonstration of PegIFN injection and muscle exercise. The control group received the same educational material at the end of the study. Reliable and valid Arabic questionnaires were used to collect the data at baseline, 3-months, and 6-months post-intervention. The questionnaires were collected information about socio-demographic factors, treatment adherence, knowledge of HCV, self-efficacy, HRQL, and social support. The data was analyzed using SPSS version 22. Generalized Estimating Equation (GEE) was applied to assess the effectiveness of the educational intervention.

The findings showed no significant difference between the intervention group and the control group at baseline regarding the primary outcome, secondary outcomes, sociodemographic, social support, and medical history variables. Post-intervention, the

GEE results (between the groups) demonstrated significantly higher changes in RBV, PegIFN, and total treatment adherence for the intervention group than the control group. The adjusted odds ratio (AOR) for RBV, PegIFN, and total treatment adherence were 2.639 (95% CI: 1.305, 5.335), 2.458 (95% CI: 1.175, 5.144), and 3.234 (95% CI: 1.621, 6.452), respectively. However, there were no significant changes within the intervention group over time.

For secondary outcomes, the GEE results between the groups (overall from baseline to 6-months) showed significantly higher changes for the intervention group than the control group, such as: for a virologic response, the AOR was 2.473 (95% CI: 1.111, 5.505). For hepatitis C knowledge, the AOR was 4.894 (95% CI: 2.842, 8.429). The AOR of GSE was 3.661 (95% CI: 1.233, 10.873). For PCS and MCS of HRQL, the AOR was 15.642 (95% of CI: 4.786, 51.118) and 25.662 (95% CI: 5.514, 119.434), respectively. The GEE results within the intervention group revealed significant changes (p<0.001) for the virologic response, hepatitis C knowledge, and GSE at 3-months and 6-months, but for MCS at 3-month only. These results provide evidence of the effectiveness of the educational intervention to sustain treatment adherence and HRQL and to improve HCV knowledge and self-efficacy.

Keywords: Hepatitis C, treatment adherence, randomized controlled trial, education intervention, Tripoli Medical Center

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

KEBERKESANAN INTERVENSI PENDIDIKAN TERHADAP KEPATUHAN RAWATAN HEPATITIS C DALAM KALANGAN PESAKIT LIBYA DI SEBUAH PUSAT PERUBATAN TRIPOLI

Oleh

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Hepatitis C adalah satu penyakit berjangkit yang disebabkan oleh virus hepatitis C (HCV). Rawatan standard bagi jangkitan ini adalah gabungan Ribavirin (RBV) dan Pegylated interferon (PegIFN) untuk 6 bulan atau satu tahun. Tempoh rawatan yang lama dan kesan sampingannya memberikan impak yang besar terhadap kepatuhan rawatan pesakit dan kualiti kehidupan berkaitan dengan kesihatan (HRQL). Objektif kajian ini adalah untuk menilai keberkesanan intervensi pendidikan bagi mempertingkatkan pematuhan rawatan sebagai hasil utama, dan mempertingkatkan hasil sekunder yang meliputi pengetahuan, keberkesanan efikasi-kendiri umum (GSE), tindakbalas virologi, skor komponen fizikal (PCS) dan skor komponen mental (MCS) bagi HRQL.

Satu cubaan perawakan terkawal, perabunan sebelah, dijalankan ke atas 103 pesakit di Pusat Perubatan Tripoli, Libya. Pesakit yang sedang dirawat dengan PegIFN dan RBV dibahagi secara perawakan blok terlindung, 51 pesakit ke kumpulan intervensi sementara 52 pesakit lagi ke kumpulan kawalan. Kumpulan intervensi menerima bahan pendidikan terdiri dari satu sesi sehari pembentangan PowerPoint, buku kecil, perbincangan, dan demonstrasi untuk suntikan PegIFN dan senaman otot. Kumpulan kawalan menerima bahan pendidikan yang sama di akhir kajian. Borang soal-selidik bahasa Arab yang sah dan boleh dipercayai digunakan untuk mengumpul data pada permulaan, bulan ke-3 dan bulan ke-6 selepas intervensi. Borang soal-selidik telah mengumpulkan maklumat mengenai faktor-faktor sosio-demografi, pematuhan rawatan, pengetahuan tentang HCV, efikasi-kendiri, HRQL, dan sokongan sosial. Data telah dianalisa menggunakan SPSS versi 22. *Generalized estimating equation* (GEE) telah digunakan untuk menilai keberkesanan intervensi pendidikan.

Hasil kajian menunjukkan tidak terdapat perbezaan yang signifikan di antara kumpulan intervensi dan kumpulan kawalan di permulaan berkenan hasil utama, hasil sekunder,

pemboleh-ubah sosio-demografi, sokongan sosial, dan sejarah perubatan. Selepas intervensi, keputusan GEE (di antara kumpulan) menunjukkan perubahan signifikan yang lebih tinggi bagi RBV, PegIFN dan keseluruhan kepatuhan rawatan bagi kumpulan intervensi berbanding kumpulan kawalan. Nisbah odd terlaras (AOR) untuk RBV, PegIFN dan keseluruhan kepatuhan rawatan adalah 2.639 (95% CI: 1.305, 5.335), 2.458(95% CI: 1.175, 5.144), dan 3.234 (95% CI: 1.621, 6.452) mengikut urutan. Bagaimanapun, tiada perubahan yang signifikan dalam kumpulan intervensi dari masa ke masa.

Untuk hasil sekunder, keputusan GEE diantara kumpulan (keseluruhan dari permulaan hingga 6 bulan) menunjukkan perubahan signifikan yang lebih tinggi bagi kumpulan intervensi berbanding kumpulan kawalan, seperti: untuk tindak balas virologi, AOR adalah 2.473 (95% CI: 1.111, 5.505). Untuk pengetahuan tentang hepatitis C, AOR adalah 4.894 (95% CI: 2.842, 8.429). AOR bagi GSE adalah 3.661 (95% CI: 1.233, 10.873). Bagi PCS dan MCS HRQL, AOR adalah 15.642 (95% of CI: 4.786, 51.118) dan 25.662 (95% CI: 5.514, 119.434). Keputusan GEE dalam kumpulan intervensi dan kumpulan kawalan menunjukkan perubahan yang signifikan (p<0.001) untuk tindakbalas virologi, pengetahuan hepatitis C, dan GSE pada 3-bulan dan 6-bulan, tetapi untuk MCS pada 3-bulan sahaja. Keputusan-keputusan ini memberikan bukti keberkesanan intervensi pendidikan untuk mengekalkan kepatuhan rawatan dan HRQL dan untuk meningkatkan pengetahuan HCV dan efikasi kendiri.

Kata kunci: Hepatitis C, pematuhan rawatan, percubaan terkawal rawak, campur tangan pendidikan, Pusat Perubatan Tripoli.

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I certify that a Thesis Examination Committee has met on 24 May 2018 to conduct the final examination of Samia Ibrahim Mohamed Adam on her thesis entitled "Effectiveness of an Education Intervention on Hepatitis C Treatment Adherence among Libyan Patients in a Medical Center in Tripoli" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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LIST OF ABBREVIATIONS / NOTATIONS / GLOSSARY OF TERMS

\leq	Less than or equals to
2	Greater than or equals to
AOR	Adjusted Odds Ratio
CBT	Cognitive Behavioral Therapy
СНС	Chronic Hepatitis C
CI	Confidence Interval
DAAs	Direct-Acting Antivirals
EoTR	End-of-Treatment virological Response
EVR	Early Virological Response
GEE	Generalized Estimated Equation
GSE	General Self-Efficacy
НВМ	Health Beliefs Model
HCV	Hepatitis C Virus
HRQL	Health-Related Quality of Life
IFN	Interferon
КМО	Kaiser-Meyer-Olkin
MCS	Mental Components Score
MEMS	Medication Events Monitoring System
MSP	Multidisciplinary Support Program
OR	Odds Ratio
PCA	Principal Component Analysis
PCR	Polymerase Chain Reaction
PCS	Physical Components Score

PegIFN	Pegylated Interferon
RBV	Ribavirin
RCT	Randomized Controlled Trial
RVR	Rapid Virological Response
SCT	Social Cognitive Theory
SD	Standard Deviation
SPSS	Statistical Package for the Social Science
SSQ6	Social Support Questionnaire-6
SVR	Sustained Virological Response
ТМС	Tripoli Medical Center
USA	United States America
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

This chapter discusses background information on hepatitis C infection, the problem statement, significance of the study, research question, objectives, and the hypothesis of the study.

1.1 Background

Hepatitis C virus (HCV), discovered in 1989, is non-A and non-B hepatitis infection (Choo et al., 1989, 2002, in press). HCV was first believed to be an infection of minor importance, which affected drug substance abusers and blood product recipient populations in the developed nations. Later, it is recognized that HCV infection is of global importance, that has an effect on all countries (Lavanchy, 2011).

HCV infection is a public health threat that causes liver disease. In 2015, it was estimated 71 million people worldwide had chronic HCV infection (World Health Organization [WHO], 2017). According to Global Hepatitis Report of the WHO (2017), the regions most affected by HCV are the Eastern Mediterranean region with a prevalence of 2.3%, and Europe with the prevalence of 1.5%. In other WHO regions, the prevalence of HCV infection varies from 0.5% to 1.0%. In Africa, HCV chronically infected more than 28 million people (Lavanchy, 2011). The HCV prevalence among general African population varied from 0.1% to 17.5%, varying by countries. The countries with the highest prevalence were Egypt with 17.5%, Cameroon with 13.8%, and Burundi with 11.3% (Karoney & Siika, 2013).

A study of five groups from Libya reported 20.5% prevalence of HCV in patients with renal dialysis, 10.8% among patients with multiple blood transfusion, 2.0% within health care workers, 1.6% of general population, and 1.2% within blood donors (Daw et al., 2002). A national surveillance registry carried out by Daw and El-Bouzedi (2014) over 1% of the total study population (65,761 people) found 1.2% of (95% CI: 1.1-1.3) of the overall prevalence of HCV. Interestingly, there is a pattern of increment slowing once the subjects reached 30 years of age. The HCV prevalence varied from 0.7 to 0.9 % for subjects less than 30 years old and 3.6% for 60 years old or above (Daw & El-Bouzedi, 2014).

WHO, in its 2003 report on medication adherence, states adherence to treatments is an essential determinant of treatment achievement. Poor adherence to the treatment limits ideal clinical benefits and subsequently reduces the general efficiency of the health system (Sabaté, 2003). Thus, non-adherence to the medication will charge more money for the treatment and increase the cost of care. According to the WHO, non-adherence to the treatment regimen is estimated to be even higher in growing nations than in

developed countries and causes critical clinical trouble in the management of patients with the long-lasting illness. The WHO clarified adherence like "the extent to which the persons' behavior (including medication-taking) corresponds with agreed recommendations from a healthcare provider" (Sabaté, 2003).

Medication adherence is described as the extension to which patients take treatment as specified by their medical practitioners, or the number of suggested doses of medicine taken by a patient over a constant time. Many healthcare providers preferred the word "adherence," since "compliance" indicates that the patient is directly following the physician's instruction and the treatment plan did not rely on an agreement confirmed between the patient and the medical doctor (Lam & Fresco, 2015). The definition of adherence became regularly unclear and varied appreciably throughout studies, which made cross-study comparison challenging.

The usual treatment for chronic hepatitis C is the combination of Pegylated Interferon alfa (PegIFN- α) and Ribavirin (RBV) for 24 to 48 weeks (six months to one year) (Chung et al., 2015). Numerous studies have shown that the most identified challenges in adhering to a PegIFN and RBV treatment regimen among HCV patients were the side effects of treatment: fatigue and decline in health-related quality of life, and for effective treatment, HCV patients should remain adherent and motivated through the course of therapy (Mauss et al., 2012; Cinar, Ozdogan, & Alahdab, 2015). Some studies reported that the non-adherence to antiviral treatment and treatment discontinuation are related to a decreased probability of virological response (Reimer et al., 2013; Re III et al., 2009).

People with chronic HCV are usually asymptomatic, lack knowledge of the infection, and are hard to reach populations, such as people who inject drugs, homeless, and marginalized groups as the incarcerated. Often, the lack of awareness and knowledge about HCV in the community result in misinformation, lack of opportunities for prevention and treatment, and stigmatization of an infected person. The lacking opportunities for prevention can cause contamination of other individuals with HCV (Ibrahim & Madian, 2011; National Academies of Sciences, Engineering, & Medicine, 2016). A study displayed the importance of self-efficacy in improving treatment adherence of HCV patients. The study found a significant association (p = 0.013) between self-efficacy and non-adherence to treatment from baseline to 3-months. The risk of non-adherence was lower among patients who had higher levels of self-efficacy at baseline (Bonner, Esserman, Golin, & Evon, 2015).

1.2 Problem Statements

The non-adherence to HCV treatment is a critical public health issue that is related to high morbidity and mortality. Libya is one of the developing countries encountering the problems of non-adherence with many chronic diseases, such as chronic liver disease caused by HCV infection. A survey carried out by Daw and El-Bouzedi (2014), in Libya reported a low prevalence of HCV in the general population (1.2%). The spread of HCV is further complicated by the outflow of migrants from North and sub-Saharan

Africa where high prevalence rates of HCV exist (Daw & El-Bouzedi, 2014). Unfortunately, based on literature research, no published studies have examined the treatment adherence or non-adherence, as well as knowledge and HRQL among HCV Libyan patients. However, there is an RCT study conducted among 372 chronic HCV Libyan patients to evaluate the role of HCV genotyping on the effectiveness of two treatment regimens (Interferon [INF] and PegIFN-based regimens). That study reported only 229 (61.6%) patients completed the treatment of both regimes (Daw, Elasifer, Dau, & Agnan, 2013). In a neighboring Egypt, a study found that men had higher levels of HCV knowledge, self-efficacy, and social support compared to women. These variables were significantly (p < 0.05) associated with high treatment adherence for men than women (Mohamed, 2017).

The side effects and complexity of treatment regimen were found to be the most common causes of non-adherence. Younossi et al. (2016) and McCombs et al. (2014) studies stated that treatment regimens with PegIFN and RBV had the worst adherence result and a higher number of side effects. These findings support the belief that significant decline in treatment adherence caused not only by treatment-associated side effects, but also the complexity of a regimen (contains more than one drug, requires modifications of behavior, requires self-injections, or last for more than three months). A cohort study found lower frequency of adherence to RBV, PegIFN, and a combination of them over the first 6-months of treatment were 46.3%, 35.4%, and 28.4%, respectively. The most common reasons for non-adherence reported by patients were the side effects of medication (Ravi, Toosi, Karimzadeh, Ahadi-Barzoki, & Khalili, 2013).

Studies have shown that adherence to HCV treatment is one of the most important predictors of effective HCV treatment and good virologic response (Re III et al., 2009; Daw et al., 2013). Re III et al. (2009) examined the relationship of adherence to a combination of HCV treatment (RBV and PegIFN) and virologic response during the first 3-months of treatment. That study found high adherence rate ($\geq 80\%$) to PegIFN and RBV treatment was associated (p< 0.001) with the decreased load of HCV in blood and EVR (Early virological response). In Libya, Daw et al. (2013) stated that 143 HCV patients treated with PegIFN and RBV, the end-of-treatment virological response (EoTR) attained by 69% of patients. The sustained virological response (SVR) was attained by 36% of patients.

Some studies in neighbouring countries confirm the importance of educational intervention for improving treatment adherence, knowledge, self-efficacy, and HRQL (Malky, Gahsh & Atia, 2016; Ibrahim & Madian, 2011; Curcio et al., 2010; Larrey et al., 2011; Cacoub et al., 2008). In Egypt, RCT assessed the effectiveness of educational intervention by a nurse and showed significant improvement of HCV knowledge post-intervention than before the intervention with an effect size (Cohen's d = 0.670). The self-efficacy was improved significantly post-intervention than before the intervention with an effect size (Cohen's d = 0.836) (Malky et al., 2016). Similarly, RCT conducted among HCV Egyptian patients reported that post-educational intervention, the intervention group had significantly better scores of HRQL than the control group (Cohen's d = 0.876) (Ibrahim & Madian, 2011).

In France, Larrey et al. (2011) used education intervention by standardized consultation with a nurse found that adherence to HCV treatment for total patients (all genotypes) was nearly significant and better in the intervention group than in the control group. For genotype 1 and 4, the OR of total treatment adherence was 2-times significantly higher in the intervention group than in the control group, at 6-months and one-year follow-up. The OR of SVR was significantly higher in the intervention than in the control group (2.5 of 95% CI, 13-4.6) (Larrey et al., 2011).

Another study in France used education intervention by a third party: health care physician other than therapist physician, and patients received educational material documents. At 6-months, the total treatment adherence was significantly higher in the intervention group than in the control group; the AOR was 1.58 (95% CI: 1.02, 2.46; p = 0.040). The SVR was significantly higher in the intervention group than in the control group; the AOR was 1.58 (95% CI: 1.02, 2.46; p = 0.040). The SVR was significantly higher in the intervention group than in the control group (Cacoub et al., 2008). A study used psychoeducation intervention among HCV drug addicts' patients. The psychoeducation intervention during sessions. The intervention group had significantly higher treatment completion (treatment adherence), the OR was 2.82 higher in intervention with (95% CI: 1.34, 5.95, p = 0.005). The SVR was better among patients with high treatment adherence; the AOR was 35.85 (95% CI: 8.76, 146.67, p<0.001) (Reimer et al., 2013).

In Italy, a RCT study used a multidisciplinary support program (MSP) and reported that treatment adherence was significantly higher by four times in the intervention group (MSP group) than in the control group (OR was 4.385 of 95% CI: 1.156, 16.637, p = 0.034) (Curcio et al., 2010). Carrión et al. (2013) study used MSP to increase patient adherence and the efficacy of PegIFN and RBV among Spanish patients. The study reported the adherence to HCV treatment was significantly higher by five times for the intervention group than the control group (OR was 4.807 of 95% CI: 2.033, 11.367). The same study found the frequency of EoTR and SVR were significantly higher by two times for the intervention group than in the control group, the ORs were 139 of 95% CI: 1.079, 4.239 and 2.072 of 95% CI: 1.224, 3.507, respectively. Therefore, few intervention studies examined the efficiency of educational interventions to enhance treatment adherence among HCV patients. The studies of (Reimer et al., 2013; Curcio et al., 2010; Carrión et al., 2013) showed significantly higher treatment adherence for the intervention group than the control group.

Further, several studies stated interventions based on theory were found to be more effective than non-theory based interventions (Sun et al., 2012; Meyer et al., 2015). Social Cognitive Theory (SCT) is one of the recommended theories to be used to change behavior and to improve patients' "self-efficacy" (Wood & Bandura, 1989). In addition, Bandura (2004) stated that other models of theories such as Health Belief Model (HBM) only deals with predicting health behavior while SCT offers both predicting the health behaviour and tell us how to change the behaviour. That is why this theory was chosen to be used as the guiding theoretical framework for this research study. Another theory based study used multimedia educational intervention combining both SCT and HBM. That study through increasing HCV knowledge and self-efficacy showed that the intervention was effective in reducing HCV associated risk behaviors

among drug addicts (Mayor, Fernández, Colón, Thomas, & Hunter-Mellado, 2010). Groessl et al. (2011) used self-management education program, which is primarily grounded in SCT, and it means engaging the patients in the day-to-day management of their illness by focusing on facilitating change, teach problem-solving skill instead of primarily disseminating information. That said, the self-management intervention program was efficient in increasing HRQL, knowledge of HCV, and self-efficacy for HCV patients.

While theory based interventions tend to have a higher success rate, some may argue that may not always be the case. When examining another study conducted by Ramsey et al. (2011) among drug addicts infected with HCV and subjected to antiviral treatment, it was found that after eight sessions of cognitive-behavioral intervention guided by SCT, the intervention did not result in higher antiviral treatment adherence or lower HCV RNA levels, or less depression-related antiviral treatment. That said, these results can be attributed to the small size of the study sample (29 patients only).

1.3 Significance of the Study

Current trends indicate that most of HCV patients deferred from treatment because of the adverse effects of medications. Observational and experimental studies suggested that educational intervention and multidisciplinary support treatment programs can increase treatment adherence to antiviral treatment. This study is one of the first clinical trial studies to examine education intervention based on the theory of SCT to enhance treatment adherence for HCV patients.

As there is currently no vaccine for HCV and it taking up to almost 20 years for a patient to develop severe complications, prohibiting exposure to HCV or changing people's behavior may help decrease the burden of disease in Libya. Health education intervention is necessary for patients with hepatitis C to strengthen their self-efficacy, thus helping them in self-manage their illness, shorten the treatment side effects, and improving quality of life.

Educating patients about their treatment, treatment adverse effects, and adherence is a well-established standard of care in many countries. The educational intervention used in this research was effective in sustaining treatment adherence, HRQL, and increasing knowledge of HCV. Therefore, the intervention will be useful in Libya in preparing a patient for HCV treatment by any professionals including medical providers or mental health and social workers.

1.4 Research Questions

The research question for this study is what is the effectiveness of health education intervention on hepatitis C treatment adherence, virological response, knowledge of

HCV, self-efficacy, and HRQL among Libyan patient in Tripoli Medical Center (TMC)?

1.5 Research Objectives

1.5.1 General Objective

The general objective of this study is to develop, implement, and evaluate the effectiveness of education intervention on hepatitis C treatment adherence, virological response, knowledge of HCV, self-efficacy, and HRQL among Libyan patients in the TMC.

1.5.2 Specific Objectives

1.5.2.1 To develop, implement, and evaluate the effectiveness of education intervention on hepatitis C treatment adherence, virological response, knowledge of HCV, self-efficacy, and HRQL among Libyan patients in the TMC.

1.5.2.2 To determine and compare the proportion of HCV treatment adherence between and within the intervention group and the control group at baseline, 3-months, and 6-months, and even after adjusting socio-demographic factors, social support, and medical history factors.

1.5.2.3 To determine and compare the proportion of undetectable HC RNA (virological response) between and within the intervention group and the control group at 3-months and 6-months, and even after adjusting socio-demographic factors, social support, and medical history factors.

1.5.2.4 To determine and compare the HCV knowledge score between and within the intervention group and the control group at baseline, 3-month, and 6-month, and even after adjusting socio-demographic factors, social support, and medical history factors.

1.5.2.5 To determine and compare the self-efficacy score between and within the intervention group and the control group at baseline, 3-month, and 6-month, and even after adjusting socio-demographic factors, social support, and medical history factors.

1.5.2.6 To determine and compare the physical component score (PCS) and mental component score (MCS) of HRQL between and within the intervention group and the control group at baseline, 3-months, 6-months, and even after adjusting socio-demographic factors, social support, and medical history factors.

1.6 Hypothesis of the Study

1.6.1 There is a significant difference in the proportion of HCV treatment adherence between and within the intervention group and the control group from baseline to 3-month and 6-months, and even after adjusting other independent variables.

1.6.2 There is a significant difference in the proportion of undetectable HCV RNA (virological response) between and within the intervention group and the control group from 3-months to 6 months, and even after adjusting other independent variables.

1.6.3 There is a significant difference in the HCV knowledge score between and within the intervention group and the control group from baseline to 3-month and 6-months, and even after adjusting other independent variables.

1.6.4 There is a significant difference in the self-efficacy score between and within the intervention group and the control group from baseline to 3-month and 6-months, and even after adjusting other independent variables.

1.6.5 There is a significant difference in the PCS and MCS of HRQL between and within the intervention group and the control group from baseline to 3-month and 6-months, and even after adjusting other independent variables.

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