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Hepatitis C Virus Education for Nurse Practitioners in Primary Care

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Hepatitis C Virus Education for Nurse Practitioners in Primary Care

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Abstract

Hepatitis C Virus (HCV) impacts close to 3.9 million people in the United States. Today, it is curable and screening tests have improved immensely. Despite national guidelines for the evaluation, monitoring, and treatment, HCV remains undiagnosed in most patients. Advanced Practice Nurses (APNs) must have sufficient knowledge of the diagnosis, management, and treatment of HCV to ensure optimization of HCV care in primary care. *Purpose:* The object of this Quality Improvement (QI) project was to appraise the effectiveness of a web-based education resource for APN's knowledge of HCV recommendations. *Methods:* An educational intervention was conducted for APNs working in primary care medicine to increase provider knowledge of screening, diagnosing and management of viral Hepatitis C which utilized a web-based provider-specific curricula. A pre-test and post-test survey was used to assess the APN's Knowledge, Attitude and Practices (KAP) regarding the current published evidence. Continuing education credits and small financial incentives were offered for participation. The curriculum was evaluated by an Infectious Disease expert APN. *Results:* One provider (out of 225 invited) completed the intervention in its entirety, 89 participants opened the pre-intervention survey and 36 of those participants completed the survey. Ten providers viewed varying sections of all the modules. Interestingly, many providers endorsed knowledge and comfort regarding HCV guidelines however, the survey responses lacked evidence of correctly translating that comprehension. *Conclusion:* Further evaluation is needed to understand the nuances of implementing provider focused education of evidence-based practices.

Keywords: Nurse Practitioner, Primary Care, APN, Hepatitis C, HCV, QI Project, quality improvement, web-based learning, continuing education, Hepatitis C Online

Hepatitis C Virus Education for Nurse Practitioners in Primary Care

Presently, there are close to 3.9 million people living in the United States with Hepatitis C virus (HCV), a blood borne contagious virus affecting the liver and roughly half are unaware of their infection (Centers for Disease Control and Prevention [CDC], 2017; Konerman & Lok, 2016; U.S. Department of Health and Human Services, 2016). In 2014 alone, there were over 30,000 new confirmed cases of Hepatitis C (CDC, 2017), which equates to over 80 new cases daily or 2-3 new cases per hour. Furthermore, deaths attributed to Hepatitis C were at an all-time high in 2014, exceeding 195,000. The Center for Disease Control and Prevention (CDC) found that Hepatitis C is killing more Americans today, than any other infectious disease. While these mortality rates are indeed alarming, Hepatitis C-related deaths are thought to be even higher since death certificates may underreport HCV as cause of death (Centers for Disease Control and Prevention, 2017; National Institute of Health, 2016).

Chronic infection is the hallmark sign of HCV (Ishii & Koziel, 2008; Tran, 2012). Detecting chronic HCV based on clinical examination and history alone is ignorant as the majority of infected patients are without symptoms. To further complicate matters, the majority of those acutely infected with the virus exhibit nonspecific symptoms such as fatigue, general malaise, and flu like conditions which are likely to be overlooked by the patient or provider. Given these difficulties, it is crucial the primary care nurse practitioner is able to evaluate risk factors, screen patients, understand diagnostic testing of HCV and management in order to minimize the course of the infection (CDC, 2017; Tran, 2012). Chronic HCV can lead to liver cancer, end stage liver failure, and is the leading cause of liver transplants today. Furthermore, advancements in treatment modalities and medical therapies allow HCV infected patients a higher probability of clearing their disease than ever before.

Attending to the disease earlier improves health outcomes and decreases healthcare costs associated with the advancement of disease (CDC, 2017). As patients remain undiagnosed and living longer with HCV, their health care requires a team of skilled providers who are competent to screen, prevent, educate and care for the disease, the adverse effects of medications available as well as the co-morbid conditions of an aging population living with the infection. (Kwong et al., 2012). Primary Care Providers (PCPs), including APNs, are in the position to screen, diagnose HCV and manage chronic patients most efficiently. However, first, APNs in primary care need a refresher on the topic as demonstrated by the literature that illustrates their discomfort caring for the patient population.

The U.S. Preventive Services Task Force has published HCV screening recommendations including offering 1-time screening for HCV infection to all individuals born between 1945 and 1965 as well as all screening all persons at high risk for infection (U.S. Preventive Services Task Force, 2017). Other recommendations include the cessation of HCV screening in all pregnant people unless they are part of a high-risk population. Also, according to the published recommendations, substance abuse is not a contraindication to treatment. The American Association for The Study of Liver Diseases (AASLD) and the Infectious Disease Society of America published evidence-based practice guidelines for the testing, evaluation, and monitoring of Hepatitis C. Unfortunately, variance exists in the implementation of those guidelines.

Despite the availability of published evidence-based guidelines PCPs including APNs, feel uncomfortable assessing and caring for HCV positive individuals (Clark, et al., 2005; Falade-Nwalia et al., 2016; Naghdi, et al., 2017; Thompson, Konerman, Choxi, Lok, 2016). Clark, Yawn and colleagues (2005) concluded through their research that less than 50% of primary care providers were confident in their knowledge of screening guidelines for patients

with chronic HCV. While most primary care providers are aware of how to locate published screening guidelines many failed to appreciate high risk populations such as baby boomers and hemodialysis and life style risk factors such as body piercings (Naghdi, et al., 2017; Thompson, Konerman, Choxi, Lok, 2016). Additionally, many primary care providers are interested in gaining more knowledge of antiviral treatment of HCV for their patients, and the majority of prescribers are not confident to initiate therapy (Lambert, 2011; Zickmund, Brown & Bielefeldt, 2007) and did not feel up to date with current treatment modalities (Thompson, Konerman, Choxi, Lok, 2016).

The desire for information is present, however, standardization of succinct and effective education is not. Aspinall and colleagues (2015) discovered through their meta-analysis that when providers targeted at risk populations for HCV screening there was an increase in cases detected. In light of this quality improvement's mission to increase Knowledge, Attitude and Practices of Advanced Practice Nurse providers in the context of primary care, consideration of their ability to diagnose and initiate treatment or managing HCV is crucial.

Falade-Nwalia and co-authors conducted a study examining screening, diagnosing and treatment of HCV by primary care providers which included APNs. Although the study was relatively small (120 providers) it did include information from nurse practitioners, physicians and physician assistants which concluded through self-rated proficiency that the majority of providers in the study endorsed limited knowledge of HCV care. Furthermore, this ineffectiveness was not connected to any one provider type.

Falade-Nwalia and co- authors (2016) also surveyed their primary care providing participants who, similarly to this project's population, worked in large nonacademic clinics in urban settings, on their prior HCV education and found that greater than 1 in 4 participants had

no prior HCV training or experience. The authors also found that despite the PCP's hesitation in providing HCV treatment, providers welcomed and inquired about more HCV training. Among those that asked about HCV training, the preferred method for education reported in this study was through online modules with specific acknowledgement from the participants to University of Washington's *Hepatitis C Online* learning modules (Falade-Nwulia et al., 2016).

In conclusion, the ineffective application of the current practice guideline regarding HCV among Primary Care Providers is indicated by the evidence that only half of HCV infected individuals in the United States have been diagnosed. Although multifactorial in nature, the lack of confirmatory diagnosis of HCV in primary care office results, in part, to the lack of easily accessible detailed education regarding the screening, diagnostic testing, prevention, and management for HCV in Primary Care. At this time, there is no standardized education offered for screening, diagnosing or managing HCV for the Advance Practice Nurse Practitioner in Primary Care.

Review of Literature

A review of the literature was conducted that focused on the educational needs of primary care providers and practice patterns related to Hepatitis C and secondarily examined online education modules benefits and practices for advanced nurse practitioners. Databases searched were Medline, PubMed, Cumulative Index of Nursing and Allied Health Literature (CINAHL) and Nursing and Allied Health Database. A search of included literature resources from the Centers for Disease Control and Prevention (CDC) and the United States Preventive Services Task Force (USPSTF) as well as Infectious Diseases Society of America. Terms and phrases used included a combination of *Hepatitis C*, *HCV*, *Hep C*, *Primary Care*, *health care provider*, *PCP*, *Nurse Practitioner*, *NPs*, *APNs*, *Advance Practice Nurses*, *Competencies*, *Knowledge and*

Attitudes, online education, web-based learning, e-learning. This review yielded only 47 articles. Studies completed in foreign countries were included due to the otherwise low yield results available. Inclusion criteria included primary source reports that were published in peer-reviewed journals within the past 9 years. Exclusion criteria included duplicate articles across databases and opinion-based pieces. The articles included were evaluated using Johns Hopkins Nursing Evidence-Based Practice Evidence Level and Quality Guide (Level 1A-5C).

The literature search was broadened to examine the outcomes of online versus computer based continuing healthcare education resulted in approximately 19 articles, of these there were 6 articles that directly compared online and classroom / face-to-face based training. To the best of this author's awareness at time of project completion, there was only one comparison study that specifically addressed educational tools for APNs in the Primary Care setting and no one including HCV instruction. Lehna and Myers (2014), conducted a study (Level 2B) which compared classroom based and web-based methods to improve Burn Prevention knowledge in Primary Care APNs. The participants were assessed at 3 intervals to examine baseline, recall and retention knowledge following the web-based and classroom education. The results demonstrated that both groups improved their knowledge after the intervention and there was no significant difference between the groups and thus concluded that a web-based tool was as good as traditional classroom instruction.

Khatony, Nayery, Ahmadi, Haghani, & Vehvilainen-Julkunen (2009) conducted a pre-test/post-test quasi experimental study (Level 2B) examining bachelor prepared nurses' knowledge following web-based instruction verses in person lecture instruction on Acquired Immune Deficiency Syndrome (AIDS). Both groups demonstrated increased understanding following the respective interventions and no significant difference was appreciated between the

groups. Khatony et al. (2009), ascertained that web-based learning is as effective for learning as face to face methods of education.

Estrella, Sisson, Roth, & Choi (2012) conducted a large randomized control trial (Level 1A) examining the effectiveness of an internet-based training module improving comprehension of chronic kidney disease (CKD) for internal medicine residents. Interestingly, Estrella et al. (2012), found that despite affiliation with a renal academic fellowship or caring for a patient population with large CKD prevalence, or increased face to face education, CKD knowledge was low. Completion of the internet-based CKD education modules showed significant improvements in internal medicine residents knowledge of CKD however, it is not understood if this increase in comprehension resulted in better patient care.

Hale, Mirakian & Day (2009) led an experimental study investigating students' satisfaction and objective learning outcomes in respect to a pharmacology education through web-based lectures verses classroom instruction. The material utilized (same instructor, text, notes, and tests) in both domains were the same for imparting understanding to the students. Course satisfaction was high for both types of instruction, but students reported higher rates of self-perceived knowledge in the traditional classroom format. Objectively, exam scores were similar between the two groups.

Porter, Pitterle & Hayney (2014) examined the performance and preferences of pharmacy students through a randomized control trial (Level 1A) in which the students were randomized to classroom or online groups and provided immunization education. The content presented between the two groups was the same. Most of the participants in this study were somewhat comfortable with technology prior to participation although most participants in either group had little experience online only courses (Porter et al., 2014). There were no significant differences

between the participants' performance between the two groups and most participants agreed that they would take a course that was presented solely online in the future (Porter et al., 2014).

The small sample quasi experimental study (Level 2C) carried out by Corbridge, Robinson, Tiffen, & Corbridge (2010) investigating learner satisfaction and knowledge attainment of APN students in regard to mechanical ventilation through simulation (in person) education or online teaching modules concluded that knowledge gained was similar between both groups. Participant engagement was similar between the groups however, student satisfaction was higher in the simulation group (Corbridge et al., 2010).

Robson (2009) conducted a small study (Level 2C) utilizing mixed methods examining web-based learning for primary care practitioners involving clinical guidelines and problem solving and judgment skills through discussion modules via the computer. Previously the primary care providers would study the clinical guidelines within organization discussions. This collegial interaction was replaced with interaction with a computer through problem-based e-learning modules. The primary care providers reported enjoying this avenue of education and preferred the e-learning modules to traditional discussion-based learning due to the time and scheduling restraints of traditional organization discussion between colleagues. Ronson (2009) concluded that most primary care physicians in the study found the e-learning modules an acceptable means of education. Additionally, most participants noted the e-learning would most likely result in a practice change with respect to the clinical guidelines incorporated (Robson, 2009).

In Walsh's (2008) study (Level 1A), over 3500 primary care practitioners (less than 15% were practice nurses) took part in online educational modules geared to increase comprehension and patient care skills for infectious diseases, including Hepatitis C. The peer reviewed online

modules included interactive case studies, histories on infectious diseases, graphics and illustrations. Pre-test and post-test questionnaires including qualitative feedback demonstrated statistically significant increase in knowledge gained from the modules. Additionally, many of the practitioners noted that they intended on changing their practice considering the education however, change in practice was not objectively evaluated in this study.

Authors Pelayo-Alvarez, Perez-Hoyos, & Agra-Varela (2013) (Level 1B) sought to investigate the effects that online education verses traditional education surrounding palliative care topics had on primary care physician's knowledge or clinical practice. Their randomized control trial occurred over 18 months and while the sample size was small the findings are noteworthy. Additionally, Pelayo-Alvarez et al (2013), reported that primary care physicians in the online education group reported increased understanding and confidence in communication during the short term. Patient scores for severity of symptoms, quality of life and family anxieties were higher in the intervention group. More participants dropped out of the control group (traditional education) during the 18-month study which could have influenced the outcomes. Although this study positively identifies that online education can influence positive practice changes the small sample size and the dropout rate in the control group should be considered.

Synopsis

While only one study specifically addressed APNs, there are multiple studies which demonstrate the effectiveness, acceptability and feasibility of continuing education via online modalities (Walsh 2008; Estrella 2012; Peyalo-Alvarez 2013). Direct comparison studies were diverse and included training modules on the following topics: Immunizations, AIDS, CKD, palliative care and pharmacology. Despite the diverse topics covered in the various learning

modules, all studies demonstrated similar or increased learning gains between those who participated in classroom and those in the online group (Khatony 2009; Hale 2009; and Porter 2014).

Not only can online training provide similar or better improvements in knowledge on a specific topic, there are implications that online education modules can positively impact patient care in the Primary Care setting. Pelayo-Alvarez et al (2013) utilized online modules to improve palliative care knowledge amongst Primary Care Providers. Their study found increased understanding of the subject matter and more importantly, demonstrated clinical effectiveness with patients reporting better symptom control and global quality of life after their provider completed the online modules.

While online based continuing education is well received and useful in the majority of studies with either equivalent or better outcomes than classroom-based training, there are exceptions. In fact, one study in Rural Australia that aimed to utilize an online learning module to improve PCPs knowledge of Diabetes Mellitus management had to be discontinued given low completion rates of less than 6%. Although no specific reasons for poor response rate were obtained from the PCPs, the authors speculated that time constraints, accessibility to specialists, and acceptability of the online module platform may have contributed to their results (Paul et al., 2017). Conversely, an earlier study by Schoen et al., (2009) which examined characteristics that predict physician participation in a Web-based CME activity about Post-MI care found that providers in rural areas were more likely to participate. Those physicians who took care of more Post-MI patients were also more likely to complete the online activity (Schoen et al., 2009).

Theoretical Framework

Utilizing theory assists in understanding and examining the phenomenon of interest better (Moran, Burson, Conrad, 2017). The Adult Learning Theory (Knowles, M.S.,1980) is credited to Malcolm Knowles who is largely responsible with our understanding of adult education and self-directed instruction. Knowles' served as Executive Director of the Adult Education Association of the United States of America in 1950. Notably, he is responsible for shifting the country's perspective on adult education from that of "educating people" to "helping them learn" (Knowles, 1950). He was committed to the belief that adult and children learners comprehend information differently. Upon studying adults' tendencies toward learning, categorizing and processing new information, Knowles' published the ALT which was constructed upon several assumptions.

While desiring to be a facilitator of information comprehension, Knowles proposed several assumptions about the underpinnings behind adult discovery and comprehension in which the ATL is based. He surmised that adult learners are receptive to learning in informal environments including but not limited to, group discussion or nontraditional classrooms. These students appreciate self-directed, flexible approach to indulge the information that is useful to their immediate needs. Although these students prefer task-oriented instruction, the ALT also assumes that the pupil absorbs information gained experientially. Knowles' Adult Learning Theory presented a sturdy structure to address the learning needs of the participants and the appropriateness of the intervention for this population.

In following Knowles' Adult Learning Theory, the participants included in this interventional project were comprised of graduate level or clinical doctorate prepared professionally employed adults. The educational intervention was offered for free and

unrestricted regarding availability and accessibility, which supported the assumption that adult subconsciously experience an internal drive towards operating autonomously and need to exert self-directed control in the manner of owning the data. This project's curriculum was constructed in a manner to attend to their partiality toward task endeavors by way of participation required, reward-based activities and assessment quizzes. Lastly, the web-based modules chosen for this intervention incorporated forums, lecture notes, case studies, videos, statistics, pictures, links to outside resources, audio, and access to the most up to date available information on the topic. In considering intended population, setting, and components of the evidence-based practice intervention, Malcolm Knowles' Adult Learning Theory provided a thoughtful framework for understanding the phenomena of adult knowledge attainment.

Project Design

The intent of quality improvement (QI) endeavors in healthcare centers on the utilization of data driven methods to improve clinical or system outcomes (Moran, Burson, Conrad, 2017). This QI project incorporated an educational evaluation design using web-based learning modules designed to increase the knowledge base and change behaviors (attitudes, awareness) of APNs in primary care regarding screening, diagnostic testing, and management of Chronic Hepatitis C Virus.

Goal, Objectives, and Expected Outcomes

Goal. The overarching goal of this project was to increase APN's knowledge around diagnosing, screening and managing viral Hepatitis C including the published evidence-based guidelines, respectively. The additional goals of this project included completion of a literature review examining online education, appraising evidence-based resources and classroom

education for APNs, promoting engagement and scholarship among the recruited APNs and composing an intervention specific Knowledge, Attitude and Practice survey.

Objectives. The primary objective of this project was to evaluate differences in Knowledge, Attitude and Practices regarding components of Hepatitis C Virus care before and after the implementation of a web-based educational program tailored specially for APNs in Primary Care. The education intervention included use of a free, evidence-based resource with a custom-made curriculum highlighting the screening recommendations, diagnosing, and management of chronic HCV in primary care. Composition of a Knowledge, Attitudes and Practice which could sufficiently gauge translation of evidence gathered from the intervention was a secondary outcome in the summation of this project.

Expected Outcomes. The expected outcomes included participation in the curricula and an increase in HCV knowledge and increase comfort in screening patients, diagnosing them and counseling the chronic HCV patient. The expectations were to have: a) 30% of the recruited APN population staff respond to the pre-intervention survey, b) an increase in comprehension which would be reflected by the quantitative measures in the pre-test and post-test survey c) at least 70% of the participants score higher in the HCV post-test survey d) 20% of APN population will complete all components of QI project.

Methods

This DNP project was conducted over a period of 14 months which included identification of the clinical issue, research of the current state of subject and the evidence-based solutions, developing the project logistics, securing stakeholder involvement, the recruitment and implementation phase, and evaluating the resulted data. Additional time was required secondary

to challenges that arose with completion rates of the educational module. A detailed report of this project's steps follows.

In early December 2016, following the DNP Project Leader's peaked interest in infectious diseases and the under diagnosis of HCV, the DNP Project Leader undertook a self-directed inquiry of primary care provider (including physician, physician assistants and nurse practitioners) education needs pertaining to HCV. Understanding the scope of the problem was followed by the development the problem statement, which was completed by February 2017. Subsequently the DNP Project Leader conducted a review of the literature pertaining to evidence-based solutions for the problem, summarized the evidence and identified an evidence-based practice as the intervention for this DNP Project Leader led Quality Improvement project in early May 2017.

After identifying University of Washington's *Hepatitis C Online* web-based education tool as the evidence-based resource as the premise for this project, the DNP Project Leader exchanged email correspondence with the site's administrators. Permission to curate a provider-specific curriculum utilizing the published education tools was obtained in May 2017. Using the information gathered by the concluded review of literature, a 10-lesson curriculum was composed highlighting published HCV screening recommendations, diagnosing, and management of chronic HCV, for the APN working primary care medicine.

Hepatitis C Online (<https://www.hepatitisc.uw.edu/>) is a free informative, and interactive web-based reserve that is made available by University of Washington, through a partnership with the International Antiviral Society-USA and funded by a grant from the Center for Disease Control and Prevention. The curated curricula, *HCV for APNs Primary Care*, used for this project included 10 sections appropriate to the care management of HCV in primary care

medicine. The included sections (Epidemiology, Screening, Diagnostic Testing, Counseling for Prevention of HCV Acquisition and Transmission, Diagnosis of Acute HCV Infection, Initial Evaluation of Persons with Chronic HCV, Counseling Patients with Chronic Hepatitis C, Goals for Treatment and Predicting Response, Making a Decision on When to Initiate HCV Therapy, Evaluating Persons with Substance or Alcohol Use Prior to Treatment) were filled with comprehensive subject matter including evidence, expert's explanations, clinical case discussion, and implications of published guidelines and recommendations as well as Continuing Education Activities (See Appendix A for complete syllabi). The intervention was evidence based, well designed, and offered via an attractive web design that holds the viewer's interest. The intervention is free to use, boasts unencumbered accessibility by the registrant, offers Continuing Education units for successful completing in the available activities (10 Continuing Education units). The DNP Project Leader completed the intended education as it was composed and set out to obtain stakeholders for involvement in the educational intervention. This program of study was published for use to registered participants in May 2017.

Unable to ascertain a reliable measurement tool to evaluate APNs in Primary Care Knowledge, Attitude and Practices (KAP) regarding current published evidence pertaining to HCV screening, diagnosis, and management, The DNP Project Leader composed the Knowledge, Attitudes and Practice survey to be used as the pre-test/post-test survey (See Appendix B). The survey, consisting of 10 questions was kept brief increasing the likelihood of provider completion following continuing education programs (Gordon et al., 2014).

The composed survey included 3 Likert Scale questions used to garner the participant's self-reported comfort towards HCV health prior to the intervention and an additional 7 "True or False" questions to assess the participant's knowledge and translation of the information in to

practice. This survey was used as the pre-test and post-test survey. The participants provided self-assessments of their knowledge/comfort level with scores 0 to 5 referring to disagree, somewhat disagree, neutral, somewhat agree and agree to the statement in question. Mean score computed by the post-test survey was meant to be compared to the mean scores of the pre-test survey.

The DNP Project Leader designed survey's questions were presented to the presiding capstone advisors for appropriateness of use, correlation with the intervention, and ability to assess for translation of evidence into practice. After an account was set up and subscription purchased, this KAP survey was published thru *SurveyMonkey* (2018) (www.surveymonkey.com/) in early June 2017.

Additionally, participation monitoring was offered through the educational intervention design. When the participant submitted the last question of the pre-test survey, they were then prompted and taken to the education resource where they were once again provided with the project's objectives. The education curriculum was monitored by the DNP Project Leader and participants who had accessed and initiated the education were sent follow up reminder emails. These emails which were intended to be reminders included information about the unfortunate complications of undiagnosed HCV as well as encouragement to continue the path to clinical scholarship. As participation in the intervention was monitored, tracking was used to identify trends when the education was completed. It was at that time that the post-test survey was sent to the participant for follow up evaluation.

During the Doctor of Nursing Practice program of study, the DNP Project Leader completed clinically relevant practical experience with a professional mentor at a federally qualifying community health center within the Philadelphia Metropolitan area. Given the lack of

evidence-based education provided for practitioners in this area of healthcare, the facility's high-risk patient population, and the web-based design of the project for easy use, the DNP Project Leader conducted an informational meeting with the organization's administration in May 2017. At that time, the DNP Project Leader obtained stakeholder support after presenting the project's intent and implications for the center, to the center's Primary Care Directory and Quality Improvement Coordinator. This relationship was agreed upon in and the first informational meeting which the DNP Project Leader would provide for the organization's APN staff was set for the end of May 2017, to occur during the monthly APN Staff Meeting.

During the May 2017 organizational APN staff meeting, the DNP Project Leader supplied a 10-slide PowerPoint presentation on the evidence around the issue, the project's intent, measurable objectives, designed curricula, implications to their practice and significance of translating evidence into practice. The DNP Project Leader provided refreshments and light snacks at this meeting. The DNP Project Leader also sought counsel from one the site's APN providers and agreed upon a project mentoring relationship. This combined organizational staff meeting and informational session concluded with info on the ability to partake in the Participation Incentives allocated by the DNP Project Leader for this project. The DNP Project Leader obtained the email contact information for every employed APN within the site to preemptively register the user for the intervention. Lastly, the DNP Project Leader disbursed and displayed informational flyers (DNP Project Leader created) throughout staff specific (i.e. break room, work room, conference areas) areas within the facility.

Following this informational meeting, the DNP Project Leader emailed the APNs to facilitate open communication, answer any questions or tend to any concerns. A brief but informative synopsis of the QI project's intent, design components, participation rewards was

again offered in this exchange. The implementation phase of the project was projected to start October 2017. Between June 2017 and September 2017, the DNP Project Leader visited and provided follow-up presentations, informational discussion and demonstration of use of web-based education intervention at the organization's monthly APN Staff Meetings.

In October 2017, the DNP Project Leader emailed the registered APNs to invite them to participate in this Quality Improvement initiative. The pretest survey was embedded into the email for easy access for the participants. Once the user completed the pretest survey they were directed to the curricula via an easy to access hyperlink on the final page of the survey. The participants were asked to complete the intervention by December 15, 2017. Weekly reminder emails were sent to the registered users to increase contributions and participate in the course.

In early December 2017, the DNP Project Leader decided to extend the participation date to January 15, 2018 in hopes of allowing more time for participants to complete the intervention. The project leader visited the stakeholder site between during this extension period in hopes of ascertaining reasons behind the lack of participation in the intervention despite positive feedback during the visits, presentations and discussions provided by the DNP student. The administrators at the organization also reached out to the APNs in hopes of encouraging their participation.

In February 2018, the DNP student decided to extend the invitation to other APNs to participate in this quality improvement project, in light of the low participation rate from the original stakeholders. This decision, approved by DNP advisor, did not change the project's overarching goal to increase APN's knowledge around diagnosing, screening and managing viral Hepatitis C including the published evidence-based guidelines, respectively. Advanced Practice Nurses of two professional advance practice Nurse Practitioner associations were emailed with the invitation request, pretest survey and curricula hyperlink. Once again, the completion date

was extended to March 1, 2018 for the original stakeholder APN group and the newly invited. Weekly emails were sent as reminders to the email addresses available.

As March 1 approached and the completion rate remained low, the DNP Project Leader contacted the organization's site Director and Quality Improvement Coordinator in hopes of securing a time frame at the March APN staff meeting to do an in-service including the intervention for the APNs. The site Director and QI Coordinator denied this request. The recruitment and implementation phase of this intervention closed on March 17, 2018. All of the participants who registered and took part in any aspect of this project were sent an email from the Project Leader, thanking them for their participation. The participant eligible for a participation rewards was contacted and provided a gift card.

Participants

Advance practice nurses who are board certified as Nurse Practitioners were the intended target population for this project. Although this intervention was devised with NPs who work in primary care offices in mind, it could be helpful for any practice setting, so employment in primary care offices was not mandatory for inclusion in the tailored education. Inclusion criteria included graduation from an accredited nurse practitioner program (including both graduate and doctoral prepared providers), board certification, having an email address and having access to internet capable device. Exclusion criteria included student level APNs, Physicians, Physician Assistants, and those who are unable to read and write in the English language.

This project was initially proposed and implemented at a federally qualifying health center in an urban setting. With four distinct clinical sites, the organization used an integrated nurse-managed model to deliver primary care, behavioral health, dental, prenatal, family planning, mind/body integration, and group education preventive services. Of their twenty-two

thousand patients who receive care at one of the 4 sites, one thousand patients under their care had Hepatitis C Virus as a diagnosis in their medical record although specification of acute, chronic, genotype or sustained viral response information was not available. At the time of implementation, the organization employed 31 full or part-time APNs including 1 APN with specialization in the care of patients with human immunodeficiency virus (HIV).

Participation in the project was extended to APNs who were registered members in 2 different professional advance practice nurse associations near the metropolitan Philadelphia, Pennsylvania area, which included APNs from New Jersey and Delaware. Inclusion and exclusion criteria remained the same and an additional 194 APNs were recruited. With the aforementioned additional recruitment, the project's participant base now included 225 board certified nurse practitioners, including both graduate and doctoral prepared providers. These APNs identified as current or former (within the last 5 years) primary care providers, employed full or part-time, and are registered members of a professional association. Level or experience in practice was not determined.

Recruitment

Health Center APN Recruitment. An informational PowerPoint presentation, which was provided by the DNP Project Leader, introduced the intervention and was conducted at two separate monthly staff meetings with the APN staff either physically present or present through teleconference modalities. Additionally, the DNP Project Leader visited each of the 4 clinical sites to speak with, provide education about and promote participation in the intervention. Food was provided, and informational flyers were displayed throughout the clinical sites. Subsequently at two different time points prior to the implementation phase, the APNs were contacted via email communication to follow up, answer any questions and address any

concerns. Intra-implementation phase site visits and email communications were sent to the group members.

Professional APN Recruitment. The participants' email address was obtained from the group database and a recruitment letter outlining the project's purpose, goal, expected outcomes, and embedded webpage of the pre-test survey was sent out. Two hundred and twenty-five APNs were emailed the recruitment letter, which included the embedded webpage or the accessible web address to the pre-test survey. Over the duration of the implementation phase, a total of 6 recruitment letters were sent out to increase participation rates.

Participant incentives. To increase participation rates and completion of the intervention, incentives were offered in the form of small monetary rewards (\$10.00 gift card for all who completed the intervention, and chance to receive \$100 cash) professional education units, and certificate of clinical excellence. For individuals who completed the project in its entirety, they were to receive a gift card not to exceed ten dollars and have their name entered for a chance to win one hundred dollars cash randomly selected at the end of the project (requires completion rate by at least two APNs). Continuing education units were allocated for each module within the curriculum and provided by the governing organization of the curricula, upon the successful completion of the course. The parent site of the education resource offered a Certificate of Excellence for any provider who completed the education in its entirety.

Evidence Based Intervention

The educational intervention chosen for this quality improvement project included the construction of an APN specific course within the evidence-based training resource known as *Hepatitis C Online. Hepatitis C* (<https://www.hepatitisc.uw.edu/>) is a free informative, and interactive web-based resource that is made available by University of Washington, through a

partnership with the International Antiviral Society-USA and funded by a grant from the Center for Disease Control and Prevention. The site functions as a complete resource for diagnosing, monitoring and managing the Hepatitis C virus infection.

In order to obtain the use of the educational resource, the DNP Project Leader exchanged correspondence with the administrators of *Hepatitis C Online* and gained permission to use the website, all provided public properties and all available clinically relevant information as needed to conduct this Quality Improvement project. The DNP Project Leader designed a curriculum using the modules available to address the education needs identified through the literature review with consideration to the screening, diagnosing, and monitoring guidelines (Refer to Appendix A) published by American Association for the Study of Liver Diseases, the Infectious Diseases Society of America and the Center for Disease Control. Additionally, the project lead conducted a brief but not exhaustive literature review of the motivating factors and outcomes of incentivizing participation.

With the assistance of the site's administrators, a syllabus was published. The web-based education included 10 lessons and was composed using the learning needs identified in the literature review above as well as published guidelines and care recommendations purported by the Center of Disease Control, American Association for the study of Liver Diseases (AASLD) and the Infectious Disease Society of America (IDSA). The topics covered in the intervention course include HCV epidemiology, screening recommendations, diagnostic testing with interpretation of results, differentiating acute infection verses chronic infection, counseling on preventing the acquisition and transmission of the virus, as well as appreciating key aspects of medical history and physical exam related to HCV.

The learning program also included information on treatment points including implications, contraindication, timing and treatment response, monitoring needs during treatment and care related to special populations such as birth cohort, substance abuse, pregnant women, and hemodialysis patients. Special topics presented through the course included alcohol consumption, use of hepatotoxic medications and dietary, herbal and over the counter medication considerations. Each individual module included adjunct resources such as published evidence-based guidelines and recommendations, the randomized control trials included in the synthesis of evidence and audio and visual aids to enhance the experience. The modules were offered without limits for completion time or number of log in attempts.

Data Collection Procedures

Data collection tools to capture data through quality improvement projects vary, however, they all should be outcome directed and project specific (Moran, Burson and Conrad, 2017). The (KAP) Survey (Refer to Appendix B) measuring the extent of information known or gained and clinical comfort regarding HCV prior to, and after the education intervention was published using the web-based survey resource, *Survey Monkey*. The recruitment population of APNs were contacted via email communication with full explanation of the study and included informed consent. This email invitation included the KAP via *Survey Monkey* embedded into the page in hopes of creating a streamlined transition into the intervention.

Additionally, participation monitoring was offered through the educational intervention's interface. This progress tracking capability was not included in the statistical analysis of this project, however, the information gleaned from the interface's activity monitoring modality was included in the data collection procedures. When the participant submitted the last question of the pre-intervention survey, they were then prompted and taken to the education resource where

they were once again provided with the project's objectives. The education curriculum was monitored by the DNP Project Leader and participants who had accessed and initiated the education were sent follow up reminder emails. These emails which were intended to be reminders included information about the unfortunate complications of undiagnosed HCV as well as encouragement to continue on the path to clinical scholarship. As participation in the intervention was monitored, the DNP Project Leader was able to track trends and identify when the education was completed. It was at that time that the post-test survey was sent to the participant for follow up evaluation.

Data Analysis. General descriptive data were obtained regarding the number of participants who opened the presurvey, answered the survey's questions, accessed the intervention, completed sessions and the total completion rate. Pre-test data were used to determine the user's self-reported KAP level regarding HCV care verses their ability to correctly answer knowledge-based questions to assess participant's translation of their comprehension into practice. Data collected on session completion rate in this project were compared to general user data provided by representatives from *Hepatitis C Online*. Pre-test and Post-test survey analysis compared scores to evaluate improvement in KAP before and after completing the intervention. The DNP Project Leader determined the most used modules in this project and compared them with the most popular modules of general users as offered by *Hepatitis C Online*. Informal conversations with APNs in this project were used to gain insight into why they may not have completed the intervention. Expert opinion was sought from an Infectious Disease specialized APN to determine the quality of the provider-specific education curricula used in this intervention.

Ethics and Human Subjects Protection

The University of Massachusetts, Amherst (UMass) Internal Review Board (IRB) Determination process was completed for this project. Due to the nature of the proposed Quality Improvement project, the IRB concluded the proposed project does not meet the definition of human subject research under federal regulations and did not require IRB review based on determination.

Results

A total of 225 APNs were invited to participate in the project. Of the total 225 participant group, 25 APNS were recruited during 3 in-person informational presentations given by the DNP Project Leader which were provided for respondents at health center which were followed up with email invitation. Additionally, 212 APNs were recruited for inclusion in the project via email correspondence alone. Lastly, 12 email addresses were nonworking and therefore not included in the results. Of the 225 participants, 89 opened the pre-intervention survey, but only 36 participants completed the survey. The rest of those who opened the survey, skipped through the questions without answering. Average time to complete pre-test survey (10 questions): 2 min 15 seconds. A total of 33 participants accessed the education curricula either using the link provided at the end of the pre-test survey or via link in email invitation. 10 people viewed components of all the modules (appeared to skip through but accessed the modules), 4 people progressed further and completed Module #1 (HCV Epidemiology) in its entirety. Continuing on, 1 person completed 2 modules in their entirety and 1 person completed the education in its entirety.

For the 36 participants who completed the pre-test survey, 69.4% (n= 25) felt confident with information pertaining to HCV screening recommendations and 72% reported knowing how

to diagnose Acute Versus Chronic HCV, and 69.5% felt capable of counseling and monitoring patients with chronic HCV. Despite their self-perceived confidence in their understanding of the clinical issue, 79% of the participants incorrectly answered counselling and diagnosis questions and 90% were incorrect for the screening guidelines. Participants on a whole were accurate in medication counseling and knew that active substance use or substance use disorder is not a contraindication to HCV treatment (58% and 66% respectively).

Hepatitis C Online shared data revealing that during the course of 1 year (9/2016 – 9/2017), there were 504,294 total users with a total of 3,530,058 possible sessions available for completion. Based on their Google Analytics a total of 907,609 sessions were completed yielding a completion rate of 25.7%. Of the 2250 possible session to complete in this project (225 participants x 10 modules per person), only 16 total sessions were completed which yields a 0.7% completion rate. Independent users of *Hepatitis C Online* were 36.7 times more likely to complete sessions than this project's population (25.7% completion rate vs 0.7% completion rate).

The one person who completed the intervention in its entirety, displayed a change in KAP of HCV guidelines as she previously incorrectly identified the gold standard of diagnosis, screening guidelines for pregnant patients, and contraindications for treatment in patients who are actively abusing substances. Prior to completing this intervention, this user correctly answered 2/7 (28.6 %) knowledge-based questions correctly on the pre-test survey. Upon completion of the education modules, this participant positively identified the correct answers 5/7 times (71.4%). Areas of improvement were noted for diagnosis HCV, HCV screening in pregnant patients and HCV treatment recommendations in substance abuse patients.

Additionally, in the pre-test survey the respondent self-identified as a health provider with limited comfort regarding HCV screening, monitoring and counseling and differentiation between Acute Verses Chronic HCV. Her post-test survey revealed an improved comfort level in approaching the clinical scenarios (Somewhat Disagree to Agree). This participant endorsed the ease of use and applicability to practice of this education curricula, Furthermore, she felt it was useful and would recommend it to other providers. This participant identified the leading factor in completion of this curricula as being the free Continuing Education units.

Data retrieved from the resources' administrators revealed that the 5 most viewed/popular modules included (in order): HCV Epidemiology in the United States, Recommendations for Hepatitis C Screening, Hepatitis C Diagnostic Testing, Counseling for Prevention of HCV Acquisition and Transmission and Diagnosis of Acute HCV Infection (UWash Educator, personal communication, February 25, 2018). Most viewed modules from project data were (in order): HCV Epidemiology in the United States and Hepatitis C Diagnostic Testing. These two topics were also in the top 5 most viewed modules for general users of *Hepatitis C Online*.

In seeking to understand more of the context around low completion rates you had informal conversations with APNs of this population group and generally they stated that lack of participation was contributed in part to lack of time, lack of interest given the availability of specialized providers and organizational culture.

Discussion

To improve Primary Care APNs knowledge in the screening, diagnosis, and management of HCV, this Quality Improvement (QI) project utilized a free web-based HCV training program created by the University of Washington funded in part by the Center for Disease Control and Prevention. Online educational tools have been utilized with similar outcomes as traditional

teaching methods with the added flexibility inherent in an online platform. Although HCV is now a curable disease, most patients are never diagnosed leading to high rates of morbidity and mortality. Thus, an educational tool such as *Hepatitis C Online*, was thought to be an easily approachable means for better training regarding HCV screening, diagnosis and management. The positive results noted for the participant who did complete the online course in its entirety demonstrated that *Hepatitis C Online* was a useful tool to improve knowledge in HCV care for APNs in primary care.

When considering Knowles' Adult Learning Theory (1980) which was used as the theoretical framework guiding much of this project, it is possible that this endeavor negated to attend to the assumption of relevance to the learner's immediate needs. All of the QI components including the pre-test, intervention and post-survey were offered through the world wide web. Internet based learning was chosen given literature that supports its efficacy on par with traditional classroom-based programs with the added benefits of easy accessibility, flexibility, individual study methods of the learners which was congruent with the ATL's assumption of adult learners. Although appraisal of the available literature suggests this topic is relevant to the learning needs of APNs in and out of primary care, many of these participants felt competent in the care of HCV patients (as noted by their self-reflection in the pretest). Even if the evidence of this competence level is lacking, their attention is most likely wandered quickly since their perception does not support it.

Despite the positive results from the participant who completed the course, the outcomes of this study were highly limited due to unforeseen circumstances. Towards the end of this QI project, there was a sudden withdrawal of stakeholders, including the leadership members of the community health center. This prompted delayed additional recruitment via professional practice

associations. This late attempt to improve the total participant pool failed to successfully recruit individuals to complete the online modules at least in part due to the fact that they had less time to complete the course, lacked the live informational sessions, and had no accountability.

Despite a low completion rate, this study did highlight some important points for discussion. Interestingly, the pre-test survey results revealed that approximately 25% of the APNs did not feel capable of counseling and monitoring patients with chronic HCV. Furthermore, pre-test survey results revealed that the majority of participants felt confident with their ability to screen, diagnose, and manage HCV, however they failed to answer the respective objective questions on the pretest correctly. Pre-test survey data revealed that 72% of participants felt confident with knowledge of HCV screening recommendations, yet close to 80% of these respondents incorrectly endorsed the need to screen all women for HCV. Similarly, most of the participants endorsed knowing how to diagnose Acute Verses Chronic HCV yet 80% incorrectly identified the gold standard test for HCV diagnosis. This increased confidence but lack of translation of knowledge into practice is dangerous for patient care and may have influenced their reasons for participating in the intervention.

Regarding the one participant who did complete all the modules, their pre-test / post-test comparison did demonstrate an improvement in the respondent's diagnostic abilities and revealed that they would recommend the course to others. The feedback provided by the lone participant who completed the project component completely was positive. That user's post-test survey revealed an improvement in knowledge and comfort with HCV care, found the website easy to navigate, the curricula informative and relevant to clinical practice and would recommend its use to colleagues.

The major limitation of this study was a poor response rate. While no specific follow-up qualitative data was obtained from the recruited APNs (n = 225) to determine exact reasons for the poor response rate, the author does have several hypotheses which are detailed below.

Too Long and Burdensome

The most likely explanation for poor participation is that the module program spanning 8 hours of instruction was simply too long for the busy APN to complete. The author sought to combat this with allowing 6 months with unlimited accessibility to the program, extensive incentives for completion of the course, both financial and professional, expansion of the initial participant pool, in-person informational sessions and follow-up visits, as well as multiple reminders via email. Additionally, from the results we know that the pre-test survey was rather short and only took on average 2 min 15 seconds to complete. Further studies using a shorter method of providing the information is warranted.

Quality of Educational Tool

Perhaps, it was the quality of the *Hepatitis C Online* program that hindered participation. Since literature search did not reveal any studies utilizing *Hepatitis C Online*, the author sought out an Infectious Disease clinical expert for review. Initially this project did not seek to include qualitative data, however, given the attrition of participants and unexpected and untimely loss of project leadership stakeholders, written testimony evaluating the provider-specific education was sought and obtained. Clinical expert opinion provided by Dr. Fletcher DNP who specializes in Infectious Disease medicine (personal communication, April 2018) noted this curriculum to be appropriate in content and language for APNs, congruent with the practice standards and guidelines. It is unlikely that the quality was an issue.

Questionable Practice Implications

From the limited data collected from those who did complete the pre-test, the majority of the respondents felt confident in their understanding of and ability to implement HCV guidelines. Perhaps they did not complete or even attempt the modules because they assumed they already knew the material. However, based on their inaccurate responses to the pre-test knowledge questions, it was apparent that they did not in fact have adequate comprehension of HCV patient care and guidelines. This point again highlights the necessity of better training and education regarding HCV screening, diagnosis, and management for APNs. Given this intervention's low completion rate, it would be incorrect to evaluate its generalizability. Additionally, this educational resource was beneficial in improving the KAP of 1 participant which makes it possible that it would be helpful to others.

In comparing the completion rates of this population (0.7%) with the completion rates of general users (25.7%), it is possible that the intervention was perhaps too long and that it is more beneficial as a reference tool. This tool has not been evaluated as a designed curriculum prior to this project and metrics provided about general users, from *Hepatitis C Online*, suggest that users tend to pick and choose which sessions to access. However, the sessions most visited by participants in this intervention are similar to the most viewed sessions by general users. This project population group's receptivity towards this education in comparison with that of general users offers interesting points to consider for future research. Areas to explore further include ideal length of time for web-based education interventions, how to attend to the adverse reactions providers feel towards continuing education/quality improvement projects, how to provide evidence-based practice education both in and out of academic medical settings, organizational incentives for incorporating evidence-based education for APNs during "work

hours.” Additionally, some recommendations gleaned from the carrying out of this evidence-based project and its findings include the importance of stakeholder involvement during the planning phase and building a curricula based on participant’s identified needs.

Conclusion

Now that HCV is curable and screening tests have improved immensely, and there is clear evidence-based practice guidance, it is of utmost importance that APNs, specifically those in primary care, can evaluate, monitor, and treat this chronic disease that can lead to significant morbidity, mortality and associated increased health care costs. Online educational tools are an accessible means to providing education. While this project did not demonstrate the efficacy of a specific online HCV learning tool, it did highlight the need for continued evolution dedicated to the most effective means of educating APNs on the care principles of HCV.

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Appendix A

Education Curriculum for HCV for APNs Primary Care

Module 1: Screening and Diagnosis of Hepatitis C Infection Overview

1. Lesson 1: HCV Epidemiology in the United States
 - a. HCV Incidence and Prevalence
 - b. Risk Factors for Acquiring HCV
 - I. CDC Case Definitions and Reporting
 - c. HCV Disease Burden
 - d. Summary Points
 - Activity 1B: HCV Incidence & Prevalence in the U.S.
 - Activity 1C.: CDC: Viral Hepatitis Statistics & Surveillance
 - CECNE Quiz: Lesson 1 Quiz
2. Lesson 2: Recommendations for Hepatitis C Screening
 - a. Historical HCV Testing Based Only on Risk Factors
 - I. Birth-Cohort (1945-1965) Hepatitis C Testing
 - II. Impact of Birth-Cohort Hepatitis C Testing
 - b. Current Hepatitis C Testing Recommendations
 - I. Summary Points
 - Activity 2B. Hepatitis C Testing Recommendations
 - Activity 2C: CDC: MMWR Hepatitis C Birth Cohort Publication
 - Activity 2D: CDC: Know More Hepatitis
 - CECNE Quiz: Lesson 2 Quiz
3. Lesson 3: Hepatitis C Diagnostic Testing
 - a. HCV Diagnostic Tests
 - b. HCV Testing Sequence
 - c. Interpreting and Communicating Test Results
 - d. Linkage to Care
 - e. Summary Points
 - Activity 3B.: Hepatitis C Diagnostic Testing
 - Activity 3C.: CDC HCV Testing Sequence for Current Infection
 - CECNE Quiz: Lesson 3 Quiz
4. Lesson 4: Counseling for Prevention of HCV Acquisition and Transmission
 - a. Sexual Transmission of HCV
 - b. Injection Drug Use and HCV Transmission
 - c. Household HCV Transmission
 - d. Mother-to-Child HCV Transmission
 - e. Summary Points
 - Activity 4B.: Counseling for the Prevention of Transmission of Hepatitis C
 - Activity 4C.: CDC Recommendations for Prevention and Control of Hepatitis C Virus Activity 4D.: HCV Transmission FAQs
 - CECNE Quiz: Lesson 4 Quiz

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- 5. Lesson 5: Diagnosis of Acute HCV Infection
 - a. Definition of Acute HCV
 - b. Clinical Features of Acute HCV
 - c. Laboratory Diagnosis of Acute HCV
 - d. 2016 CDC Case Definition for Acute HCV
 - e. Summary Points
 - Activity 5B.: Acute Hepatitis C Virus Infection
 - Activity 5C.: CDC: Surveillance Guidelines for Acute Hepatitis C
 - CECNE Quiz: Lesson 5 Quiz

Module 2: Evaluation, Staging, and Monitoring of Chronic Hepatitis C Overview

1. Lesson 1: Initial Evaluation of Persons with Chronic Hepatitis C
 - a. Key Aspects of Medical History
 - b. Key Aspects of Physical Examination
 - i. Recommended Laboratory Studies after Initial Diagnosis
 - ii. Immunizations for Persons with Chronic HCV
 - c. Screening for other Causes and Contributors of Liver Disease
 - d. Summary Points
 - Activity 1B.: Initial Evaluation of Patients with Chronic HCV
 - Activity 1C.: Calculating Body Mass Index (BMI)
 - Activity 1D.: Determining AUDIT-C Score
 - CECNE Quiz: Lesson 1 Quiz
2. Lesson 2: Counseling Patients with Chronic Hepatitis C
 - a. Over-the-Counter Medications and Vitamins
 - b. Alcohol, Tobacco, and Marijuana
 - c. Diet and Modifying Obesity
 - d. Complementary and Alternative Medicines
 - i. Summary Points
 - Activity 3B.: Counseling Patients with Chronic Hepatitis C
 - Activity 3C.: National Center for Complementary and Alternative Medicine
 - CECNE Quiz: Lesson 3 Quiz

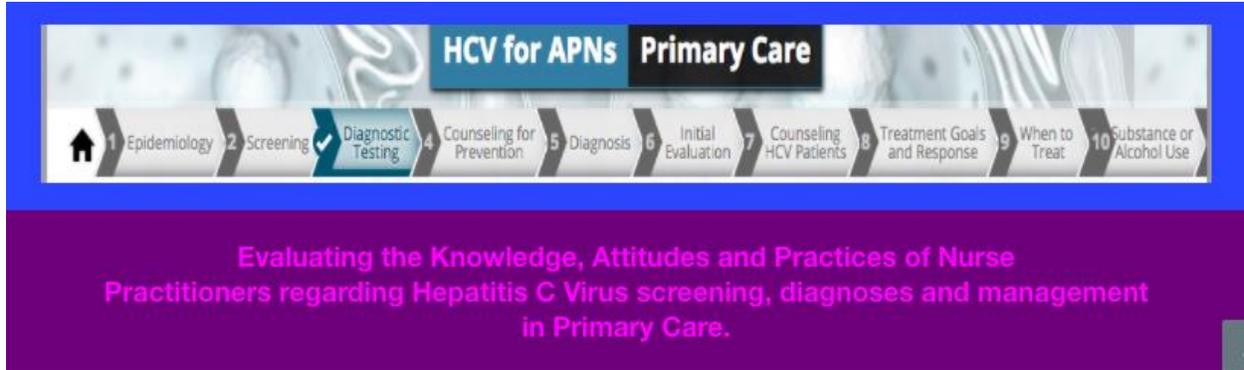
Module 3: Evaluation and Preparation for Hepatitis C Treatment Overview

1. Lesson 1: Goals for Treatment and Predicting Response
 - a. Goals and Rationale for Treatment
 - i. Viral Factors that Predict Response to Therapy
 - ii. Host Factors that Predict Response to Therapy
 - b. Prior Treatment Response
 - i. Summary Points
 - Activity 1B.: Goals for Treatment and Predicting Response
 - Activity 1C.: ACG Treatment Resources
 - CECNE Quiz: Lesson 1 Quiz
2. Lesson 2: Making a Decision on When to Initiate HCV Therapy
 - a. Indications for Treatment

- b. Contraindications for Treatment
 - I. Patient Readiness
 - II. Timing of Initiation of Treatment
 - III. Monitoring and Follow-Up if Not Treated
 - IV. Summary Points
 - Activity 2B.: Making a Decision on Whether to Initiate Treatment
 - Activity 2C.: Impact of Successful Treatment of Hepatitis C
 - CECNE Quiz: Lesson 2 Quiz
- 3. Lesson 3: Evaluating Persons with Substance or Alcohol Use Prior to Treatment of Hepatitis C
 - a. Approach to HCV Treatment in Persons with Substance Use
 - i. Impact of Substance Use on HCV Treatment Decisions
 - ii. Alcohol Consumption
 - iii. Opioid Use
 - iv. Stimulant Use
 - v. Other Drugs
 - vi. Summary Points
 - Activity 4B.: Addressing Substance and Alcohol Use Prior to HCV Treatment
 - Activity 4C.: Harm Reduction Coalition and Hepatitis C
 - CECNE Quiz: Lesson 4 Quiz

Appendix B

Pre-test and Post-test Survey



1. I am knowledgeable of HCV screening recommendations
 - Agree - 1
 - Somewhat Agree - 2
 - Somewhat disagree - 3
 - Disagree - 4

2. I feel capable of counseling and monitoring patients with chronic HCV
 - Agree - 1
 - Somewhat Agree - 2
 - Somewhat disagree - 3
 - Disagree - 4

3. I know how to diagnose Acute verses Chronic HCV
 - Agree - 1
 - Somewhat Agree - 2
 - Somewhat disagree - 3
 - Disagree - 4

4. Patients with chronic hepatitis C without cirrhosis may take up to 2 grams per day of Acetaminophen.
 - True
 - False
 - Answer:** True (Scott, J. (2018).

5. All pregnant women need to be routinely tested for HCV
 - True
 - False
 - Answer:** False. Not at this time however, possible in the future as discussions are underway (AASLD-IDSAs, 2017).

6. The gold standard for the laboratory diagnosis of acute HCV is anti-HCV seroconversion combined with a positive HCV RNA test with a positive Aspartate Aminotransferase (AST)
- True
False
Answer: False; anti-HCV seroconversion with +HCV RNA + Alanine Aminotransferase (ALT) (Fox and Spach, 2018).
7. HCV testing is recommended for all people who have received blood products or organ transplants prior to 1985
- True
False
Answer: False, prior to 1992 (Spach, 2018).
8. Patients with chronic Hepatitis C infection should be immunized against hepatitis A and B, influenza and receive Pneumovax but not Prevnar vaccine
- True
False
Answer: False. It is TRUE that you need HepA, HepB, Influenza, Pnuemovax. The Center for Disease Control and Prevention, (2018) ascertains “All adults through age 64 with chronic liver disease, including hepatitis C, need to get vaccinated with Pneumovax. You may also need a 1-time dose of Prevnar, depending on the medications you are taking for hepatitis C or, if you have another high-risk condition, * such as immunosuppression, or lack of a functioning spleen. At age 65 (or older), you will need a dose of Prevnar if you haven’t received it previously, and a second dose of Pneumovax, provided at least 5 years have passed since your first dose. Prevnar and Pneumovax are usually spaced 1 year apart.”
9. A sustained virologic response (SVR) is an undetectable HCV RNA at 12 weeks. An undetectable HCV RNA 24 weeks after antiviral therapy is considered a virologic cure.
- True
False
Answer: True (Scott & Kim, 2017)
10. Active substance use or substance use disorder is a contraindication to HCV treatment.
- True
False
Answer: False (Coffin, 2017).