

**An Educational Intervention Among Healthcare Providers on the Science Behind  
Adequate Hydration in Mental Health Patients: A Quality Improvement Project**

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## Abstract

Hydration improves health and performance and affects all age groups (Holdsworth, 2012; Munteanu et al., 2021). Predictions are that 75% of Americans are chronically dehydrated (Taylor & Jones, 2020). Hydration improves cognition and health (Haghighatdoost et al., 2018). This Quality Improvement Project (QIP) evaluated the impact of an educational intervention among healthcare providers on the science behind adequate hydration in mental health patients. The project evaluated self-efficacy, attitudes, and awareness among healthcare providers.

The project was based on a pre-test/post-test survey method with a total of 15 participants drawn from a convenience sample that volunteered for the education intervention. The participants included mental health care providers, which consisted of licensed mental health counselors (LMHC), licensed clinical social workers (LCSW), psychiatric nurse practitioners (PMHNP-BC), psychologists, and psychiatrists. 0.05. The pre-test and post-test for knowledge scores p-value was 0.003. This is less than 0.05 and is considered statistically significant. This significant result means that the null hypothesis may be rejected, as there is no change in scores.

Despite the limitations identified in this study, the educational intervention regarding knowledge and awareness of hydration presents a valuable tool for increasing knowledge and self-efficacy in educating healthcare providers. Results of this project have positive implications for nursing practice, healthcare outcomes, healthcare delivery, and policy changes.

*Keywords:* “dehydration”, “hydration”, “mental function”, “cognition”, “mood”, AND “memory”

Hydration is the cornerstone for living healthfully and enhancing the quality of life. A hormone-mediated homeostatic mechanism finely tunes the body's hydration status (Armstrong & Johnson, 2018). Dehydration emerges when a fluid imbalance in the body's fluid compartments reduces total body water (Zhang, et al., 2021). There is increasing evidence that dehydration impacts morbidity and mortality (Bethancourt et al., 2020; Hooper et al., 2015, 2016; Katz et al., 2021) of the population with an increased risk among the elderly either in a healthcare institution or in home care (Edmonds et al., 2021; Murray, 2017). The Dietary Reference Intakes recommended the average daily water intake for Water, Potassium, Sodium, Chloride, and Sulfate, and the Panel on Dietetic Products, Nutrition, and Allergies. The recommended daily fluid intake should be 1600 mL or higher (Hodgkinson et al., 2003). However, 50–92% of care home residents suffer from dehydration (Cook et al., 2019). Therefore, intervention is needed to enhance daily fluid intake to the recommended level to reduce the risk of complications of dehydration (Bruno et al., 2021).

Dehydration management, therefore, is of utmost importance for healthcare providers (Lecko, 2013). The practitioner-delivered intervention to reduce oral mucositis and prevent dehydration proved promising in overcoming the untoward consequences of dehydration (Ruegg et al., 2021). Ruegg and colleagues concluded that the healthcare provider could provide emotional support, which was the key to avoiding dehydration among the participants. Consequently, adequate knowledge concerning hydration should be delivered by healthcare providers either in the hospital or in-home care (McCotter et al., 2016; Ruegg et al., 2021) to minimize the risk of dehydration with a consequent increase in mental and physical performance and reduction of healthcare costs (Mentes & Gaspar, 2020).

## **Problem Statement**

Hydration is essential for general health and physical performance (Holdsworth, 2012; Munteanu et al., 2021). Dehydration is a condition that commonly affects the population across the age span. It is thought that approximately 75% of Americans are baseline chronically dehydrated (Taylor & Jones, 2022). An accumulation of evidence emphasizes the impact of good hydration in reducing morbidity risk factors (Popkin et al., 2010). Proper hydration enhances mental function and well-being (Haghighatdoost et al., 2018). Studies have shown a significant association between cognitive function and the hydration status of the body (Katz et al., 2021; Wittbrodt & Millard-Stafford, 2018). It was estimated that a 3–5% reduction in body mass due to dehydration leads to impaired mood and cognitive performance in athletes (Dube et al., 2022). It was concluded that hydration increased relevant task performance when engaging in tasks involving cognitive reflection in judgment and decision-making (Patsalos & Thomas, 2020). Hydration improved memory and focused attention in participants who suffered minor dehydration, defined as a dehydration loss of less than 1% of body weight (Benton et al., 2016).

Dehydration was associated with an increased risk of poor course of morbidity, mortality, and costs for health services (Edmunds et al., 2021). Given the impact of dehydration on the physical and mental health of the individual, institutions in Europe and the United States (US) have developed recommendations to prevent dehydration in the general public (Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate, 2005; EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA), 2010).

Healthcare providers are considered the hinge joint for preventing and treating dehydration in the community (Ruegg et al., 2021) and for delivering the appropriate hydration guidelines (McCotter et al., 2016). Therefore, the awareness of dehydration problems among

healthcare providers should be adequate (Holdsworth, 2012). However, it was reported that the knowledge and perception of healthcare providers were inadequate regarding the significance of hydration on the morbidity and mortality of patients (Mosleh et al., 2021). Healthcare providers were found to have insufficient hydration knowledge, negative attitudes toward recognizing the symptoms and signs of dehydration, and inadequate clinical expertise to effectively treat their patients (Paulis et al., 2022). If armed with the appropriate knowledge and skills, healthcare providers would be able to recognize and manage dehydration in time (Pickenhan et al., 2020). Consequently, there is a rising need to provide appropriate education interventions to healthcare providers to enhance awareness of the dehydration problem (Belogianni et al., 2019; Monnerie et al., 2015; Ruegg et al., 2021).

### **Significance**

The significance of this quality improvement project (QIP) is to highlight the effect of dehydration on mental function, including cognitive, mood, and memory function. Consequently, this study directs the attention of healthcare providers to dehydration among patients and emphasizes the importance of rehydration in preserving and restoring the patient's mental functioning. Moreover, this QIP provides an educational quality improvement intervention that promotes healthcare providers' knowledge and awareness of hydration benefits, assessment, and management. As a result of this research, the quality of healthcare that is provided to the patient will improve.

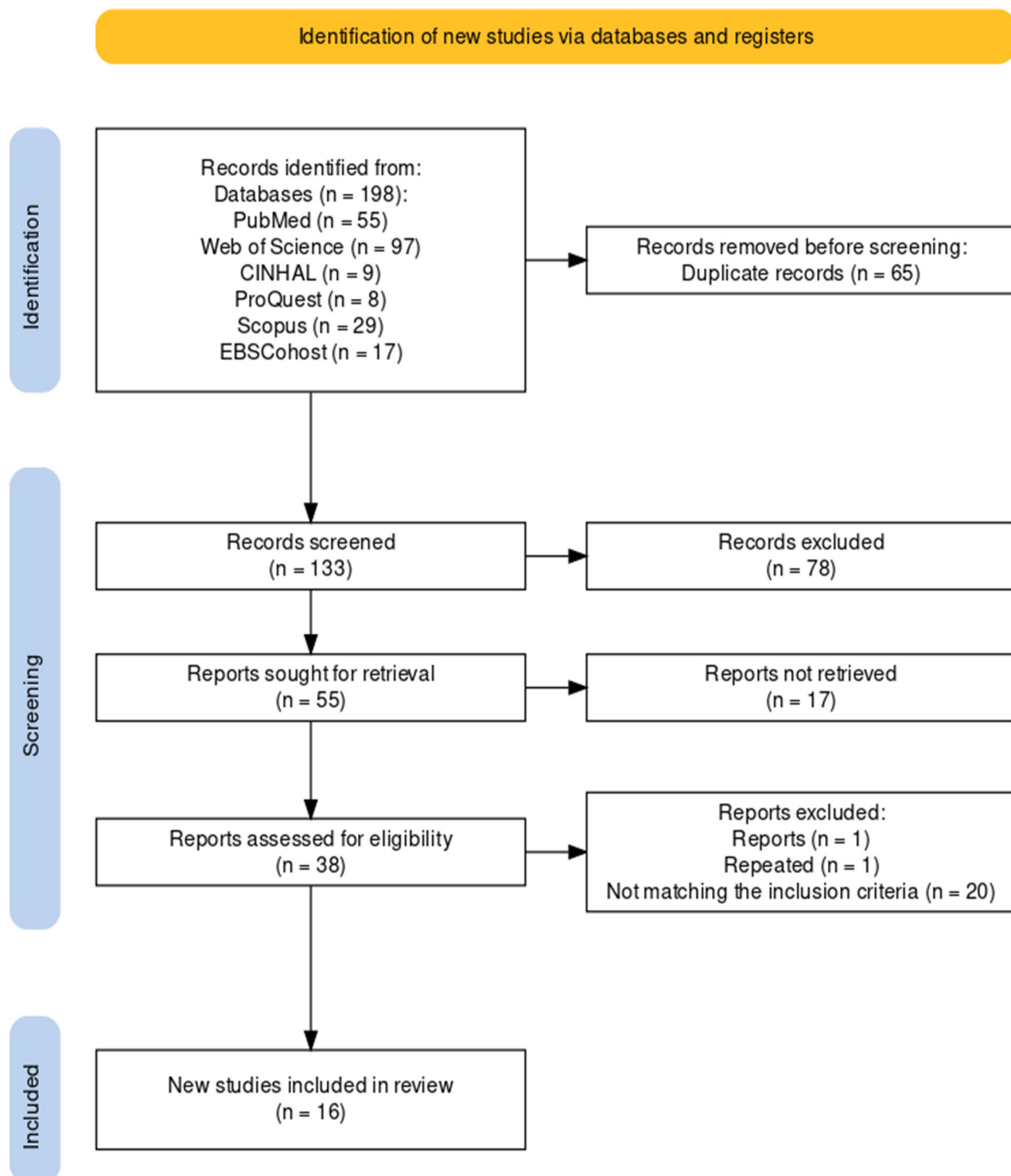
### **Summary of the Literature/Evidence Related to the Clinical Question**

Evidence from the literature emphasizes the significant impact of dehydration on mental function that can be reversed with rehydration and water supplementation (Bethancourt et al.,

2020; Deshayes et al., 2022; Zhang et al., 2020; Zhang et al., 2021). Athletes and workers who were exposed to a dehydrating environment showed a reduction in cognitive function (Aghili et al., 2018; Ayotte & Corcoran, 2018; Cvirn et al., 2019; Dube et al., 2022). Furthermore, exposure to a hot environment impacted mood parameters in females rather than males (Bethancourt et al., 2020). In addition, water supplementation showed mood-enhancing effects in healthy individuals exposed to dehydrating conditions such as rigorous exercise or a hot environment (Dube et al., 2022; Mojtabaaghili et al., 2018; Suh et al., 2021; Zhang et al., 2021). Moreover, rehydration enhances memory in dehydrated individuals (Bialecka-Debek & Pietruszka, 2019; Cousins et al., 2019; MacLeod et al., 2018; van den Heuvel et al., 2017). Therefore, mental health providers must ensure that their patients receive an adequate water supply to preserve their mental function.

Researchers have long proposed mild to moderate dehydration impairs mental function, notably when surpassing 2% body mass loss (Wittbrodt & Millard-Stafford, 2018). However, the current literature has not consistently supported this proposition (Goodman et al., 2019). What is known about the relationship between hydration status and cognitive performance is based on exercise-induced and heat-induced trials that may independently influence alertness, mood, and cognitive performance (Mandolesi et al., 2018). It is uncertain whether hydration status under typical daily living conditions relates to variations in mental function regarding cognition, mood, and memory (Benton & Young, 2015; Bethancourt et al., 2020).

Figure 1: PRISMA Literature Review Process



### **Purpose/ PICO Clinical Questions/Objectives**

P= Mental healthcare providers at a clinic in Miami, Florida who are subjected to pre-test.

I= An educational intervention on adequate hydration

C= The same mental healthcare providers who were subjected to post-test

O= Improve self-efficacy, attitudes, and awareness among healthcare providers regarding adequate hydration in mental health patients as stated by a scoring system.

### **PICO Clinical Question**

1. Is there a change in the self-efficacy, attitudes, and awareness of mental health providers at the clinic in Miami concerning pre- and post-educational intervention on adequate hydration?

### **Definition of Terms**

**Euhydration:** the fluctuation of total body water is maintained at < 1% of the total body weight per day (Watson et al., 2015).

**Dehydration:** the uncompensated fluid loss of less than 1-2% of body weight from water depletion (Collins & Claros, 2011) either by fluid loss, diminished intake, or both (Johnson & Adams, 2020).

**Hypohydration:** Excessive body weight loss from water >2% (Deshayes et al., 2022; Nuccio et al., 2017).

**Adequate water intake:** this represents an amount of water that should meet the needs of almost everyone in a specific life-stage group who is healthy, consumes an average diet, and performs moderate levels of physical activity (Salari-Moghaddam et al., 2020),

### **Conceptual Underpinning and Theoretical Framework of the Project**

This Doctor of Nurse Practitioner (DNP) project will adopt Bandura's self-efficacy approach as the framework. Albert Bandura & Huston (1961) proposed that the individual attains and learns new behaviors by pursuing the behavior of an influential model (Bandura, 1999). Self-efficacy is a fundamental modulator of Bandura's social cognitive theory (Betz, 2007) because it influences the projected behavior outcomes (Bandura, 2004; Ozer, 2022). Bandura's self-efficacy theory includes knowledge, attitudes, confidence, and the ability to perform tasks. Beliefs influence various cognitive, motivational, emotional, and decision-making processes in the individual's ability to make progress and achievement. If individuals have high confidence in their abilities, they are more likely to think positively and take steps to improve themselves. It was concluded that individuals with high self-efficacy are inclined to perceive complicated tasks as a challenge to be governed.

On the other hand, low self-efficacy is associated with avoidance and negative expectations of the outcomes (Mark et al., 2011). Using Bandura's theory of self-efficacy as a guiding principle, this DNP project will concentrate on enhancing mental health practitioners' self-efficacy, attitudes, and knowledge. A higher level of perceived self-efficacy among those who offer mental health treatment may improve the overall quality of care (Bandura, 2004).

## **Methodology**

### **Setting and Participants**

The setting of this quality improvement project (QIP) is a residential behavioral health clinic for women and children coming out of the incarceration system, domestic violence, and substance abuse environments in Miami, Florida, USA. The participants were mental health care providers, which consisted of licensed mental health counselors (LMHC), licensed clinical social workers (LCSW), psychiatric nurse practitioners (PMHNP-BC), psychologists, and psychiatrists.

### **Description of Approach and Project Procedures**

For this QIP, an experimental design consisting of a single group pre- and post-test will be adopted. The QIP aims to improve self-efficacy, attitudes, and awareness of hydration among healthcare professionals. Giving healthcare providers basic information regarding water supply and dehydration problems is proposed to improve the quality of healthcare delivery.

The author of this dissertation invited potential participants by email (mental healthcare providers in the residential behavioral health clinic for women and children). The email included an invitation to a presentation during a weekly treatment team meeting. The notification provided the purpose of QIP. The DNP student presented an overview of the project during the meeting and recruited participants during a July 2023 meeting.

The DNP student ensured the meeting room was calm, adequately lit, and comfortable. Lunch was provided. The DNP student introduced herself to the participants and verbally explained the aim of this QIP and its goals. Next, a hard copy/paper informed consent was given to the attendees. Then, the DNP student emphasized that the engagement of the participants in the QIP was voluntary, with no obligation of any kind. The participants were instructed that the given information and the collected data would remain confidential and would be anonymized

when the DNP student shares the results of the QIP with a third party. The DNP student collected, stored, and managed the data. After the informed consent was completed, a hard-copy/paper pre-test questionnaire was provided to collect socio-demographic and pre-test data. The participants responded to the socio-demographic form and a pre-intervention questionnaire based on the reviewed literature to assess self-efficacy, attitudes, and awareness. The DNP student was available to respond to any inquiry from the participants.

After finishing the pre-test questionnaires, the intervention was delivered via an educational PowerPoint presentation for approximately 30 minutes, which was presented to the group and individually if needed, in the weekly treatment team meeting. Then the voiceover PowerPoint presentation was emailed to the participants for further reference. The educational intervention included information about water intake requirements, the impact of dehydration on the mental health of their patients, and the proper way to manage dehydration and keep their patients hydrated.

After the educational intervention, the DNP student administered the paper/hard-copy post-intervention questionnaire to the participants in QIP. The post-test questionnaire reassessed self-efficacy, attitudes, and awareness gained (compared to the previously addressed in the pre-test) to detect changes following the intervention. The data collected by the pre-test and post-test questionnaires are pertinent to self-efficacy, attitudes, and awareness assessment.

### **Protection of Human Subjects**

Institutional Review Board (IRB) approval was acquired from Florida International University (FIU), Miami, Florida, USA. Additionally, the DNP student obtained authorization to carry out the QIP from the nursing controlling team at the residential behavioral health clinic for women and children in Miami, Florida, USA.

The participants were drawn from a convenience sampling of available healthcare providers within the Miami, Florida, USA, residential behavioral health clinic. Participants were recruited from the providers that attend the weekly clinical conferences/treatment team meetings. Written informed consent was obtained from all the studied subjects to join after clarifying the aim and objectives of this QIP. The DNP student ensured privacy and confidentiality were appropriate, the knowledge obtained was valuable, and there were no hazards to participating.

### **Data Collection**

The socio-demographic data include age, gender, educational level, occupation, working experience (in years), certifications, and previously received training courses about dehydration. These data were collected once. The pre-test and post-test questionnaires collected data about the participants' self-efficacy, attitudes, and awareness about dehydration. The pre-test and post-test questionnaires were handed out, and the participants were asked to put them in two separate pre- and post-test boxes when completed. The student maintained possession of the questionnaires upon completion.

### **Data Management and Analysis Plan**

The DNP student entered the data from the pre-test and post-test questionnaires into a spreadsheet stored on a secure, password-protected laptop. The metadata was filed in the appropriate format for the organization in the DNP student's file system. The data was then downloaded directly to IBM SPSS Version 29 for statistical analysis. Therefore, data safety was ensured. Moreover, access to the participant's data was limited to the DNP student. These data will never be shared with a third party. Any data distribution for the study's purpose will remove identifying information from the record.

The quantitative data presented includes the range, total mean, and standard deviation (SD). A dependent paired t-test is used to compare the mean scores. A Pearson correlation coefficient ( $r$ ) was employed to test the relationship between ratio scores. For categorical variables with only two levels, a one-group pretest-posttest, McNemar's chi-square test was applied. Statistical significance was set at  $P \leq 0.05$ .

## Results

### Data Collection

Data were analyzed using IBM SPSS Version 29. Data were collected for 17 participants. The data were gathered using pencil and paper, then manually entered into an excel spreadsheet and then transferred directly to SPSS. The data were cleaned for missing cases. Of the 17 who participated, 13 (76.5%) completed both the pre-test and the post-test surveys. Participants who did not complete both the pre-test and post-test were excluded from the final sample.

### Sample Characteristics

Table 1 displays frequencies and percentages for the demographic characteristics of the final sample participants. The participants ranged in age from 24 to 60 years ( $M = 37.85$ ,  $SD = 11.59$ ), and the time in their current post ranged from 0 to 16 years ( $M = 6.20$ ,  $SD = 6.60$ ). Most participants were female ( $n = 10$ , 76.9%) and Hispanic ( $n = 10$ , 76.9%). The largest proportion of participants had been mental health providers for 5 to 10 years ( $n = 6$ , 46.2%). Most participants had master's degrees ( $n = 7$ , 53.8%), most were certified mental health providers ( $n = 10$ , 76.9%), and most had no additional certifications ( $n = 8$ , 61.5%). Prior to the study, the majority of participants had not attended any trainings on hydration in the past year ( $n = 11$ , 84.6%).

**Table 1***Final Sample Demographic Characteristics*

Variable	Frequency	Percent
<b>Sex</b>		
Female	10	76.9
Male	3	23.1
<b>Ethnicity</b>		
Hispanic	10	76.9
African American	2	15.4
Other	1	7.7
<b>Time as a mental health provider</b>		
Less than 5 years	3	23.1
5 to 10 years	6	46.2
10 to 25 years	2	15.4
Over 25 years	2	15.4
<b>Education level</b>		
Bachelors	3	23.1
Master	7	53.8
Other	3	23.1
<b>Certified mental healthcare provider</b>		
Yes	10	76.9
No	3	23.1
<b>Additional certifications</b>		
Yes	5	38.5
No	8	61.5
<b>Trainings attended on water hydration</b>		
None	11	84.6
From 1 - 3	1	7.7
More than 3	1	7.7

**Summary of Results**

To determine if there was a change in hydration knowledge following the intervention, the number of correct answers to survey questions 1-9 were counted for the pre-test and post-test

for each participant. To determine the test-retest reliability of the knowledge scores, a correlation coefficient was calculated between the pre-test and post-test knowledge scores. There was a strong correlation between pre-test and post-test knowledge scores ( $r = .66, p = .015$ ), indicating high test-retest reliability.

Table 2 presents descriptive statistics for the number of correct answers to the knowledge questions at pre-test and post-test. On average, participants answered approximately one more question correctly on the post-test compared to the pre-test. A paired samples *t*-test was performed to determine if there was a statistically significant change in the number of knowledge questions participants answered correctly. Before interpreting the *t*-test results, the assumption of normality was examined through a histogram of the pre-test/post-test difference scores (see Figure 1). The scores appeared normally distributed, so the assumption of normality was met. The *t*-test results were significant,  $t(12) = 3.74, p = .003, d = 1.04$ , indicating a statistically significant increase in the number of knowledge questions answered correctly following the intervention.

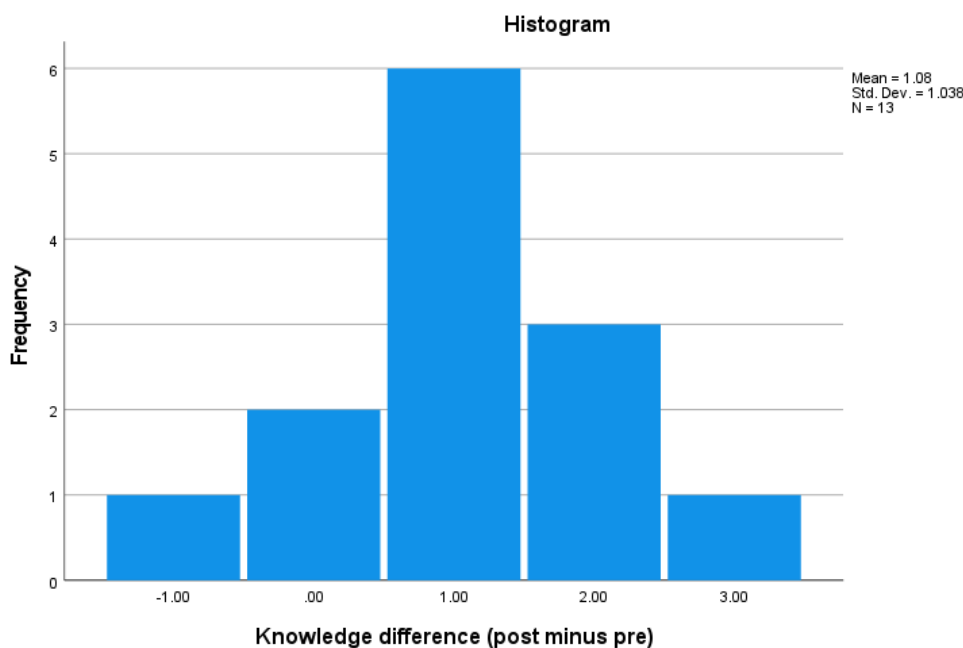
**Table 2**

*Descriptive Statistics for Number of Correct Answers on Knowledge Questions Pre-test and Post-test*

Variable	Mean	Std. Deviation
<b>Knowledge pre-test correct answers</b>	4.23	1.17
<b>Knowledge post-test correct answers</b>	5.31	1.32

**Figure 1**

*Histogram of Pre-test/Post-test Knowledge Difference Scores*



Additional questions were analyzed to determine changes in attitudes toward hydration following the intervention. Table 3 displays descriptive statistics for the pre-test and post-test responses to the survey questions about participants' self-rated hydration status at work, the importance of giving hydration advice to people with kidney stones, and hydration education for their profession. Three participants rated their hydration status as bad on the pre-test, and this number improved to zero on the post-test. Two participants rated their hydration status as excellent on the pre-test, and this number improved to four on the post-test. A Friedman analysis of variance (ANOVA) by ranks showed that the change in responses to hydration status was statistically significant ( $p = .008$ ). On the pre-test, ten participants felt it was essential to give hydration advice to people with kidney stones, and this number improved to 12 on the post-test. A Friedman ANOVA by ranks showed that the change in responses to this question was not statistically significant ( $p = .157$ ). On the pre-test, eight participants felt hydration education was

essential to their profession, and this number improved to 12 on the post-test. A Friedman ANOVA by ranks showed that the change in responses to this question was statistically significant ( $p = .046$ ).

**Table 3** *Pre-test and Post-test Responses for Hydration Status, Importance of Advice, and Importance to Profession*

Question	Pre-test		Post-test	
	<i>n</i>	%	<i>n</i>	%
<b>How would you rate your general hydration status when at work? Pre-test and Post-test Responses for Hydration Status, Importance of Advice, and Importance to Profession</b>				
Bad	3	23.1	0	0.0
Average	7	53.8	5	38.5
Good	1	7.7	4	30.8
Excellent	2	15.4	4	30.8
<b>How important do you feel giving hydration advice is to people with kidney stones?</b>				
Very important	10	76.9	12	92.3
Somewhat important	3	23.1	1	7.7
<b>How important do you feel hydration education is for your profession given competing priorities in training?</b>				
Very important	8	61.5	12	92.3
Somewhat important	5	38.5	1	7.7

Table 4 displays descriptive statistics for the pre-test and post-test responses to the survey questions pertaining to participants' behaviors and hydration awareness. On the pre-test, 11 participants believed managing hydration was the responsibility of the dietitian, doctor, and patient, and this number increased to 13 on the post-test. One participant believed consuming too much water can always be detrimental to patient health on the pre-test, and this number increased

to three on the post-test. On the pre-test, four participants indicated they always ask stroke patients about their hydration, and this number increased to six on the post-test. One participant encouraged their patients to drink water and other non-caffeinated beverages on the pre-test, and this number increased to six on the post-test. The number of participants who indicated that they always ask about the color of the patient's urine was the same for the pre-test and post-test ( $n = 3, 23.1\%$ ), however, the number of participants who never asked decreased from seven on the pre-test to three on the post-test. On the pre-test, nine participants indicated they have and make use of water dispensing facilities at work, and this number increased to ten on the post-test. No participants indicated on the pre-test that they spent more than ten minutes giving hydration advice during a clinical session, and this number increased to two on the post-test.

**Table 4**

*Pre-test and Post-test Responses for Behaviors and Awareness*

	Pre-test		Post-test	
	<i>n</i>	%	<i>n</i>	%
<b>Is managing hydration the responsibility of:</b>				
Patient	2	15.4	0	0.0
All of the above (dietitian, doctor, and patient)	11	84.6	13	100.0
<b>Do you think consuming too much water can be detrimental to the health of a patient?</b>				
Never	1	7.7	0	0.0
Rarely	5	38.5	4	30.8
Sometimes	6	46.2	6	46.2
Always	1	7.7	3	23.1
<b>Do you regularly ask your stroke patients about their hydration?</b>				
I never ask	5	38.5	3	23.1
I occasionally ask	4	30.8	3	23.1
I regularly ask	0	0.0	1	7.7

I always ask	4	30.8	6	46.2
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**Do you encourage your patients to drink water to stay hydrated?**

No	4	30.8	1	7.7
No, but I tell them to decrease tea and coffee (caffeine intake)	1	7.7	1	7.7
Yes, water only	7	53.8	5	38.5
Yes, water and other non-caffeinated and within-reason caffeinated beverages	1	7.7	6	46.2

**Have you ever asked about the color of the patient's urine, relevant to hydration status?**

I never ask	7	53.8	3	23.1
I occasionally ask	3	23.1	3	23.1
I regularly ask	0	0.0	4	30.8
I always ask	3	23.1	3	23.1

**Does your main place of work have easily accessible water dispensing facilities?**

Yes, and I make use of it	9	69.2	10	76.9
Yes, but I do not use it	4	30.8	2	15.4
No response	0	0.0	1	7.7

**Approximately how many minutes on average would you spend in a 4-hour clinical session on giving hydration advice to patients?**

0	6	46.2	3	23.1
<10	4	30.8	6	46.2
>10	0	0.0	2	15.4
Difficult to quantify	3	23.1	2	15.4

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## Summary

Pre-test and post-test survey responses from 13 participants were analyzed to determine what changes occurred following the intervention. A paired samples *t*-test showed that participants answered significantly more hydration knowledge questions correctly after the intervention. Participants' self-rated hydration status and perceived importance of hydration education to their profession significantly increased after the intervention. Interestingly, the

results also showed changes following the intervention in participants' hydration-related behaviors and awareness, such as more participants asking about patients' urine color and more participants encouraging patients to drink water and other non-caffeinated beverages.

## **Discussion**

### **Limitations**

#### ***Small Sample Size***

There were a few limitations in the study that may have affected the amount and quality of the data. The most significant limitation may be the small sample size. Only 17 of the possible 23 participants agreed to participate in the study. Furthermore, of the 17 participants, only 13 completed the study protocol. To address this limitation, including multiple behavioral health centers could mitigate the issue of a small sample size.

#### ***Data Coding***

A second related limitation affected the amount of data in the paired samples. Participants were requested to create and label their questionnaires with an alphanumeric value as an identifier at the top of both pre-test and post-tests. Some of the participants could not remember their identifier and had to start over, and four of the participants did not complete the post-test, decreasing the total completed responses to 13 participants. Additionally, the clinical site had many providers resign, and many new hires during the study needed to be encouraged to attend. To prevent this from occurring in future studies, the pre and post tests should already include a randomly generated alphanumeric code to avoid participant forgetfulness.

#### ***Summer Holiday***

The study occurring over the summer months proved to be limiting as well, as many of the healthcare providers were on holiday for the summer school break. Implementing the study during a non-summer season would have allowed for a greater sample size. Furthermore, being short-staffed burdened the rest of the healthcare providers, leaving less time for them to engage with the study altogether. To address this limitation including multiple behavioral health centers and conducting research during the Spring time could mitigate this factor.

### ***Staffing***

Other limitations related to the burden of short staffing were that the type and format of the study needed to be changed while it was ongoing. This related to the healthcare providers having less time to engage, and it was necessary to change to hard-copy/paper and pencil questionnaires in order to get complete data collection in a timely fashion. In addition, personality characteristics, self-doubt, and internal apprehension of appearing uninformed may have contributed to applying higher values to confidence and knowledge in the pre-test. It should also be noted that innovation fatigue and emotional exhaustion due to too many organization-directed workplace interventions (DeChant et al., 2019) may have also been prevalent. Being that staffing in healthcare is a recurring issue for many facilities, addressing this limitation may be difficult.

### ***Measures***

Furthermore, it should be known that the value of the measuring scale produced by the student was not a validated tool for measuring confidence and knowledge. It was not subjected to the rigor of a third-party process and evaluation for strengths or identification of different parts of the educational material or reliability. Most validation tools undertake Readability Index (RI) testing, calculated utilizing the Flesch Reading Ease Formula, and scores under 50 should be

revised (Arora, Sinha, Malhotra & Ranjan, 2017). Limited resources and time constraints prevented the student from extensively evaluating the questionnaires and RI.

### **Implications for Advanced Practice Nursing**

The value of the capstone project reaches outside the existing nursing practice. The project results indicate implications for nursing practice, healthcare outcomes, healthcare delivery, and policy changes. This project helped healthcare providers improve their self-efficacy, attitudes, and awareness regarding adequate hydration as evidenced by the by the data analysis of pretest and posttest responses for hydration status, importance of advice, and importance to profession in table 3 and analysis of behaviors and awareness in table 4. On the post-test analysis no one rated their general hydration status as bad, compared to the pre-test response. Furthermore, double the amount of participants rated their general hydration status when at work as excellent as compared to pre-test. As well, when asked how important the participant felt hydration education is for the profession, upon post-test the amount of providers answering very important increased by nearly 31% from pre-test responses. Based on the study, clinical leadership at Agape will be incorporating hydration education practices into their standard of care. Healthcare providers will screen for dehydration upon admission and throughout residency. Instituting a hydration protocol will facilitate and improve the care of the residential clients, while improving healthcare outcomes in the population served. It is important to note that 11 of the 13 participants (85%) reported not having any previous education regarding adequate hydration. Therefore, the clinic should also institute as part of their annual training requirement continuing education that covers the science behind adequate hydration.

The healthcare providers reported anecdotally, their pleasure with receiving the information and that after instituting the evidence-based recommendations for water intake themselves,

feeling an improvement in their mentation and their overall well-being. The Chief Medical Officer recommended the student discuss the project with the clinic's grant writer as they are interested in receiving funding to further implement the study recommendations, and this process is in progress. The student has also been invited to represent, alongside the clinic, at community functions, including a WINGS for Children and Families, a federal grant site sponsored by the Center for Mental Health Services (CMHS) of the U.S. Department of Health and Human Services, Office of Substance Abuse and Mental Health Services, event, to disseminate the findings and implement within the community population served.

### **Discussion of the Results with Implications to Advanced Nursing Practice**

The results emphasize the adequacy of knowledge and awareness of healthcare providers regarding the science behind dehydration. The educational intervention enhances the adequacy of the healthcare providers' self-efficacy, attitudes, and awareness. Therefore, healthcare providers will be able to promote and improve healthcare quality. The results of this study will ensure the significance of continuous education and in-practice training for leveling up the quality of care provided by healthcare providers and improving the overall delivery of healthcare.

## **Nursing Practice**

This project incorporated collaboration between administrators, mental healthcare providers, personnel, and clients. It demonstrated that a healthcare provider in a behavioral health institution could have an impact by providing education on the science behind the standards of adequate hydration, and this impact is greater than direct client care in a residential behavioral health facility alone. Since the clients spend most of their daily time in a residential facility, approaching the client on the most influential platform, their residence, could alter the success of the educational intervention. Additionally, opening dialog with healthcare providers, who are the frontline sources of information for clients, by sharing evidence-based guidelines in the residential setting can potentially improve the quality of care provided to clients.

## **Healthcare Outcomes**

The literature analysis regarding the knowledge, attitudes, and science behind adequate hydration demonstrates that healthcare providers may have varying levels of knowledge on the subject matter. One of the factors associated with the discrepancies is a lack of consensus and unified recommendations (Taylor & Jones, 2022). According to the results, this project provided education for healthcare providers, which proved invaluable, especially for healthcare providers possessing no prior evidence-based knowledge of the subject matter.

Although, specific data regarding the knowledge base for healthcare providers is not universally recorded in a database. Interviews with the healthcare providers revealed encouraging information and feedback. According to the healthcare providers, each time they educated the resident and provided the tools and resources, the provider felt empowered to help the resident achieve optimal hydration status. The providers noted an improvement in the mood of the residents.

## **Healthcare Delivery**

The results of the QIP could potentially enhance healthcare delivery by improving and streamlining the knowledge base of the healthcare provider. Collaboration and implementation of similar projects may enhance healthcare provider knowledge, awareness, self-efficacy, and attitudes and will translate into improved mental health status for clients and improved healthcare outcomes. Reducing dehydration-related symptoms in the mental healthcare patient through the simple act of the client being adequately hydrated can be life-changing for healthcare providers and clients alike.

## **Healthcare Policy**

Healthcare providers use quality improvement to enhance delivery of care, which is the science of improvement (AHRQ, 2023). For this QIP, the researcher initiated an in-depth analysis of existing educational protocols, hydration tracking procedures, and available resources at the residential behavioral health center. Regarding healthcare policy, the impact of the project could be far-reaching. Not only do such educational interventions evaluate existing knowledge on the science behind adequate hydration in healthcare providers, but it also enables the identification of evidence-based practices and solidifies the importance of educational interventions to improve healthcare delivery and policies. Additionally, the approach undertaken may lead to new educational projects between healthcare administrators and healthcare providers and policy changes within the facility. The positive outcomes of small, simple changes could influence policy changes on state and federal levels.

## **Conclusions**

The QIP aimed to implement and evaluate an evidence-based educational intervention on the science behind adequate hydration. After descriptive statistical analysis, pre- and post-test

survey responses from 13 participants were analyzed to determine what changes, if any, occurred following the intervention. A paired samples *t*-test showed that participants answered significantly more hydration knowledge questions correctly after the intervention. Results for individual question pairings revealed favorable effects on knowledge and self-efficacy. Ultimately, the resources in the educational intervention were revealed to be a valuable resource for healthcare providers.

The project findings illuminate the importance of additional educational interventions to enhance further the healthcare providers' knowledge and self-efficacy, addressing knowledge gaps, access to available resources, and changes to existing policies on hydration. For healthcare providers, collaboration with administration and clients and community health involvement could aid in the simple but complex task of hydration education and implementation. Early intervention preventing hydration deficits and perpetual curiosity for improving the quality of healthcare delivery keep the system as a continuously evolving, quality improvement work in progress.

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## Appendices

### Appendix A: IRB Approval Letters



Office of Research Integrity

Research Compliance, MARC 414

<b>MEMORANDUM To:</b>	Dr. Rosa Roche
<b>CC:</b>	Louisa Agresti
<b>From:</b>	Maria Melendez-Vargas, MIBA, IRB Coordinator
<b>Date:</b>	April 20, 2023
<b>Protocol Title:</b>	“An Educational Intervention Among Healthcare Providers on the Science Behind Adequate Hydration in Mental Health Patients: A Quality Improvement Project”

The Florida International University Office of Research Integrity has reviewed your research study for the use of human subjects and deemed it Exempt via the **Exempt Review** process.

**IRB Protocol Exemption #: IRB-23-0171**

**IRB Exemption Date: 4/20/23**

**TOPAZ Reference #:** 112762

As a requirement of IRB Exemption you are required to:

- 1) Submit an IRB Exempt Amendment Form for all proposed additions or changes in the procedures involving human subjects. All additions and changes must be reviewed and approved prior to implementation.
- 2) Promptly submit an IRB Exempt Event Report Form for every serious or unusual or unanticipated adverse event, problems with the rights or welfare of the human subjects, and/ or deviations from the approved protocol.
- 3) Submit an IRB Exempt Project Completion Report Form when the study is finished or discontinued.

**Special Conditions:** N/A

For further information, you may visit the IRB website at <http://research.fiu.edu/irb>.


MMV/em



## MEMORANDUM

**To:** Dr. Rosa Roche

**CC:** Louisa Agresti

**From:**   
Carrie Bassols, BA, IRB Coordinator

**Date:** July 12, 2023

**Proposal Title:** “An Educational Intervention Among Healthcare Providers on the Science Behind Adequate Hydration in Mental Health Patients: A Quality Improvement Project”

**Approval #** IRB-23-0171-AM01

**Reference #** 112762

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The Florida International University Office of Research Integrity has approved the following modification(s):

- ï Changed proposed data collection research platform from FIU RedCap to paper/hard-copy.
- ï Modified Section 6.1 to reflect new duration time (30 mins, over 4 weeks)
- ï Updated recruitment letter and consent forms to reflect new duration details.

There are no additional requirements in regards to your study. However, if there are further changes in the protocol after you commence your study, then you are required to resubmit your proposal for review. For further information, you may visit the FIU IRB website at <http://research.fiu.edu/irb>.

## Appendix B: Letter of Support

Date: 02/13/2023

Charles P. Buscemi, PhD, APRN

Clinical Associate Professor

Nicole Wertheim College of Nursing & Health

Sciences Florida International University

Dear Dr. Buscemi:

Thank you for inviting Agape Network to participate in the DNP Project of Louisa Agresti. I understand that this student will be conducting this project as part of the requirements for the Doctor of Nursing Practice program at Florida International University (FIU). After reviewing the project's proposal titled *"An Educational Intervention Among Healthcare Providers on the Science Behind Adequate Hydration in Mental Health Patients: A Quality Improvement Project."* I have warranted her permission to conduct the project in this company.

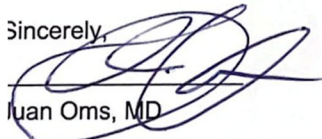
We understand that the project will be developed in our setting and will occur in two sessions, and likely be implemented afterward. We are also aware of our staff participation in supporting the student to complete this project, including grant the student access to our facilities, give consent, deliver the pre-test questionnaire, provide the educational intervention and the posttest questionnaire to the recruited participants. We will provide a peaceful and safe environment to safeguard our participants' privacy and adequate area to conduct the educational activity.

This project intends to evaluate if a structured educational program targeting healthcare providers will increase knowledge and awareness of the science behind adequate hydration. Before implementing this project, the Florida International University Institutional Review Board will evaluate and approve the procedures to conduct the project. Evidence suggests that training on the science behind adequate hydration in healthcare settings should be ongoing to ensure long-term sustainability and improve practice. Successful education on adequate hydration will improve healthcare providers knowledge and awareness and our patient's healthcare indicators and improve patients' quality of life.

The educational intervention will be done via a PowerPoint presentation in person and will last 45-60 minutes. The student will provide the educational materials to each participant. Any data collected by Louisa Agresti will be kept confidential and stored in a password-protected computer.

We expect that Louisa Agresti will not interfere with the normal office performance. Furthermore, Ms. Agresti will behave professionally and follow the office standards of care. As the Medical Director of Agape Network, I support our healthcare providers' participation in this project and look forward to work with you.

Sincerely,



Juan Oms, MD

Chief Medical Officer

Agape Network

22790 SW 112<sup>th</sup> Avenue, Miami, Florida 33170

Telephone: 305-235-2616

## Appendix C: Consent Form



### CONSENT TO PARTICIPATE IN A QUALITY IMPROVEMENT PROJECT

“An Educational Intervention Among Healthcare Providers on the Science Behind Adequate Hydration in Mental Health Patients, A Quality Improvement Process.”

#### PURPOSE OF THE PROJECT

You are being asked to be in a quality improvement project. The goal of this project is to increase healthcare providers’ knowledge and attitudes on the science behind adequate hydration through an educational intervention targeting mental healthcare providers and ancillary staff as well as to identify tools and guidelines that could be implemented in the mental healthcare setting to improve patient care.

#### NUMBER OF PROJECT PARTICIPANTS

If you decide to be in this project, you will be one of approximately fifteen people participating in this research project.

#### DURATION OF THE PROJECT

Your participation will require about 30 minutes of your time in the first session and 10 minutes in the second session.

#### PROCEDURES

If you agree to be in the project, we will ask you to do the following things:

1. At your first session, you will complete a demographic questionnaire, which includes general information such as age, gender, position in practice; and a pre-test with assessing knowledge, attitudes, and education on adequate hydration.
2. In the first session, you will receive a 30-minute educational program regarding the science behind adequate hydration management and guidelines, and patient centered care.
3. After, you will be asked to complete the hydration post-test.

#### RISKS AND/OR DISCOMFORTS

This project involves minimal physiological, physical, social, legal, and economic risks. Risk is the same as if participants were in their home filling out a hard-copy questionnaire or viewing an online video. However, if you become fatigued during the online session, they can opt out.

## **BENEFITS**

The following benefits may be associated with your participation in this project: An increase in knowledge and awareness in the effects of adequate hydration, which will help you to better assess hydration status. The overall objective of the program is to increase the quality of healthcare delivery, improving the health indicator of our patients, and increase healthcare provider/patient engagement.

## **ALTERNATIVES**

There are no known alternatives available to you other than not taking part in this project. However, if you like to receive the educational material given to the participants in this project, it will be provided to you at no cost.

## **CONFIDENTIALITY**

The records of this project will be kept private and will be protected to the fullest extent provided by law. If, in any sort of report, we might publish, we will not include any information that will make it possible to identify you as a participant. Records will be stored securely, and only the project team will have access to the records.

## **COMPENSATION & COSTS**

There is no cost or payment to you for receiving the health education and/or participating in this project.

## **RIGHT TO DECLINE OR WITHDRAW**

Your participation in this project is voluntary. You are free to participate in the project or withdraw your consent at any time during the project. Your withdrawal or lack of participation will not affect any benefits to which you are otherwise entitled. The investigator reserves the right to remove you without your consent at such time that they feel it is in the best interest.

## **DNP STUDENT CONTACT INFORMATION**

If you have any questions about the purpose, procedures, or any other issues relating to this research project, you may contact Louisa K. Agresti at 305-407-6031, [lagre002@fiu.edu](mailto:lagre002@fiu.edu) or Dr. Charles Buscemi at 305-348-4870, [cbuscemi@fiu.edu](mailto:cbuscemi@fiu.edu).

## **IRB CONTACT INFORMATION**

If you would like to talk with someone about your rights of being a subject in this project or about ethical issues with this project, you may contact the FIU Office of Research Integrity by phone at 305-348-2494 or by email at [irb@fiu.edu](mailto:irb@fiu.edu).

## **PARTICIPANT AGREEMENT**

I have read the information in this consent form and agree to participate in this project. I have had a chance to ask any questions I have about this project, and they have been answered for me. I understand that I will be given a copy of this form for my records.

## Appendix D: Email to Participants

### Recruitment Email for An Educational Intervention Among Healthcare Providers on the Science Behind Adequate Hydration in Mental Health Patients: A Quality Improvement Project

Dear Healthcare Provider,

My name is Louisa K. Agresti, and I am a student from the Graduate Nursing Department at Florida International University. I am writing to invite you to participate in my quality improvement project. The goal of this project is to improve the healthcare professionals' knowledge of the science behind adequate hydration for the mental health patient. You are eligible to take part in this project because you are a healthcare provider at Agape Network, and you provide or may provide care to mental health patients. I am contacting you with the permission of your medical director and clinical nurse director.

If you decide to participate in this project, you will be asked to complete and sign a consent form for participation. You will complete a pre-test questionnaire, which is expected to take approximately 10-15 minutes. Then, you will then be asked to view an approximately 30-minute-long educational presentation in person at a designated treatment team meeting, followed by an email with the information from the presentation. After viewing the presentation, you will be asked to complete the post-test questionnaire, which is expected to take approximately 10-15 minutes. No compensation will be provided.

Remember, this is completely voluntary. You can choose to be in the study or not. If you'd like to participate, please complete the consent and hard-copy survey provided. If you have any questions about the study, please email or contact me at [lagre002@fiu.edu](mailto:lagre002@fiu.edu) or 305-407-6031.

Thank you very much.

Sincerely,  
Louisa K. Agresti

## Appendix E: Pre-test Post-test Questionnaire



### Pre-test and Post-test Questionnaire: Knowledge and Awareness of Hydration

#### INTRODUCTION

The primary aim of this DNP project is to explore the awareness and practice of healthcare providers regarding the science behind dehydration including the operational definition of dehydration, the daily requirements, dehydration detection and diagnosis, dehydration prevention, and dehydration risk reduction. Additionally, this project is going to explore the awareness and practice of healthcare providers about the impact of dehydration on cognition, mood, and memory.

Please answer the question below to the best of your ability. The questions are either in multiple choice or true/false format. These questions are meant to measure knowledge and perceptions on identification, referral, management, and patient education on adequate hydration in mental health clients.

Thank you for taking the time to complete this questionnaire. Your responses will remain anonymous and will be used for research purposes only. Please complete all questions, choosing the most correct answer for knowledge-based questions and your honest opinion for all other questions. This will not take more than 10 minutes of your time.

#### PERSONAL

#### INFORMATION

Specialty Area: \_\_\_\_\_

Years in current position: \_\_\_\_\_

Hospital/Practice: \_\_\_\_\_

Current designation: \_\_\_\_\_

**1. How old are you? (please mention your age)**

\_\_\_\_\_

**2. What is your sex?**

\_\_\_\_\_ Female

\_\_\_\_\_ Male

**3. What is your ethnicity?**

\_\_\_\_\_ Hispanic

\_\_\_\_\_ Caucasian

\_\_\_\_\_ African Americans

\_\_\_\_\_ Asian

\_\_\_\_\_ Other (please specify) \_\_\_\_\_

**4. Position/Title:** \_\_\_\_\_

**5. How many years as a mental healthcare provider?**

\_\_\_\_\_ Less than 5 years

\_\_\_\_\_ 5 to 10 years

\_\_\_\_\_ 10 to 25 years

\_\_\_\_\_ Over 25 years

**6. Level of Education:**

\_\_\_\_\_ Associates

\_\_\_\_\_ Bachelors

\_\_\_\_\_ Master

\_\_\_\_\_ Other (please specify) \_\_\_\_\_:

**7. Are you a certified mental healthcare provider?**

\_\_\_\_\_ Yes

\_\_\_\_\_ No

**8. Do you have any additional certifications?**

\_\_\_\_\_ Yes

\_\_\_\_\_ No

If so, please specify: \_\_\_\_\_

**9. How many years have you been a mental healthcare provider?**

- Less than 6 months  
 6 months to 2 years  
 2 years to 5 years  
 Over 5 years

**10. How many trainings (in any format: in person, online, WINK, class, BHU, etc.) have you attended in the past year that focused on water hydration?**

- None  
 From 1-3  
 More than 3  
 cannot remember

**QUESTIONNAIRE**

**Please circle your answer:**

**1) Some physical signs of dehydration may include**

- a. Dry mucous membranes  
 b. Headaches  
 c. Increased pulse rate  
 d. All of the above

**2) What is the proposed definition of dehydration?**

- a. Loss of water from the body over the amount consumed  
 b.  $\geq 10\%$  loss of body mass (assuming that there is no weight loss because of negative energy balance) due to fluid loss  
 c. When someone feels thirsty, has a dry mouth, and has pitting edema  
 d. Excessive addition of body water with an accompanying disruption of metabolic processes

**3) Water forms how much of an adult person's body weight?                      a. 30–40%**

- b. 40–50%  
 c. 50–60%  
 d. 70–80%

**4) Mild-to-moderate dehydration can impair performance on tasks such as:**

- a. Short-term memory

- b. Arithmetic ability
  - c. Psychomotor skills
  - d. All of the above
- 5) **As recommended by the CDC and the IOM (2004) total daily water for adult men is accepted as \_\_\_\_\_?**
- a. 1.7 L
  - b. 2.7 L
  - c. 3.7 L
  - d. 4.7 L
- 6) **As recommended by the CDC and the IOM (2004) total daily water for adult women is accepted as \_\_\_\_\_?**
- a. 1.7 L
  - b. 2.7 L
  - c. 3.7 L
  - d. 4.7 L
- 7) **In general, does the average older person have a similar water requirement to that of a 30-year-old?**
- a. Yes, if the older person is active and healthy
  - b. Yes, if the older person is inactive and unhealthy
  - c. No, if the older person is active and healthy
  - d. No, if the older person is inactive and unhealthy
- 8) **Recommended adequate intake of fluid for an adult refers to:**
- a. Drinking water
  - b. Drinking water plus beverages (ie, tea, coffee, juice)
  - c. Drinking water plus food moisture (ie, soup, fruit, vegetables)
  - d. Drinking water plus beverages plus food moisture
- 9) **Water can be found in food and drinks. On average, what is the proportion of water in food and drinks consumed?**
- a. 10% Food:90% Drink**
  - b. 20% Food:80% Drink
  - c. 30% Food:70% Drink
  - d. 40% Food:60% Drink

**10) How would you rate your general hydration status when at work?**

- a. Bad
- b. Average
- c. Good

Excellent

**11) How important do you feel giving hydration advice is to people with kidney stones? a.**

**Very important**

- b. Somewhat Important
- c. Unimportant
- d. Very unimportant

**12) How important do you feel hydration education is for your profession given competing priorities in training?**

- a. Very important
- b. Somewhat Important
- c. Unimportant
- d. Very unimportant

**13) Is managing hydration the responsibility of:**

- a. Dietitian
- b. Doctor
- c. Patient
- d. All of the above

**14) Do you think consuming too much water can be detrimental to the health of a patient?**

- a. Never
- b. Rarely
- c. Sometimes
- d. Always

**15) Patients who have had a stroke may have an altered sensation of thirst. Do you regularly ask your stroke patients about their hydration?**

- a. I never ask
- b. I occasionally ask
- c. I regularly ask
- d. I always ask

**16) Do you encourage your patients to drink water to stay hydrated?**

- a. No
- b. No, but I tell them to decrease tea and coffee (caffeine intake)
- c. Yes, water only
- d. Yes, water and other non-caffeinated and within-reason caffeinated beverages

**17) Urine color may reflect the patient's current state of hydration. Have you ever asked about the color of the patient's urine, relevant to hydration status?**

- a. I never ask
- b. I occasionally ask
- c. I regularly ask
- d. I always ask

**18) Does your main place of work have easily accessible water dispensing facilities?**

- a. Yes, and I make use of it
- b. Yes, but I do not use it
- c. No, and I would use it if available
- d. No, but I don't see the need

**19) Approximately how many minutes on average would you spend in a 4-hour clinical session on giving hydration advice to patients?**

- a. 0
- b. <10
- c. >10
- d. Difficult to quantify

## Appendix F: DNP Symposium Project Presentation Slides

### An Educational Intervention among Health Professionals on the Science Behind Adequate Hydration in Mental Health Patients: A Quality Improvement Project

Louisa Agresti

Florida International University

NGR 7941C

Dr. Michael Sanchez

**FIU** Nicole Wertheim  
College of Nursing  
& Health Sciences

### Introduction:

➤ Hydration is the cornerstone for living healthy and enhancing the quality of life. Dehydration emerges when there is a fluid imbalance in the body fluid compartments resulting in an overall reduction of the total body water (Zhang et al., 2021).

➤ The practitioner-delivered intervention proved promising in overcoming the untoward consequences of dehydration (Ruegg et al., 2021).

Zhang, J., Ma, G., Du, S., Liu, S., & Zhang, N. (2021). Effects of Water Restriction and Supplementation on Cognitive Performances and Mood among Young Adults in Baoding, China: A Randomized Controlled Trial (RCT). *Nutrients*, 13(10). doi:10.3390/nu13103645.

Ruegg, T. A., Morse, J. M., & Wecheli, R. L. (2021). Nurse-Delivered Telephone Intervention to Reduce Oral Mucositis and Prevent Dehydration. *Oncology Nursing Forum*, 48(2), 242-256. doi:10.1188/21.ONF.242-256

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### Problem Statement:

➤ Mental health care providers lack the adequate knowledge regarding dehydration and its impact on the mental function of the patients (McCotter et al., 2016).

McCotter, L., Douglas, P., Laur, C., Gandy, J., Fitzpatrick, L., Rajput-Ray, M., & Ray, S. (2016). Hydration education: developing, piloting and evaluating a hydration education package for general practitioners. *BMC open*, 6(12), e012004. <https://doi.org/10.1136/bmjopen-2016-012004>

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### Significance of the Study:

#### The significance of the current study is:

- To highlight the significant effect of dehydration on mental function.
- To gain the attention of healthcare providers regarding dehydration among patients.
- To provide educational interventions that promote the level of self-efficacy, attitudes, and awareness of healthcare providers regarding the issue of dehydration.

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### Summary of the Literature:

- ❖ Evidence from literature emphasizes the significant impact of dehydration on mental function (Bethancourt et al., 2020).
- ❖ Dehydration has an impact on cognitive function (Ayotte & Corcoran, 2018), mood (Mojtabaaghili et al., 2018), and memory (Bialecka-Debek & Pietruszka, 2019) of the patients.

Bethancourt, H. J., Kenney, W. L., Almeida, D. M., & Roisinger, A. Y. (2020). Cognitive performance in relation to hydration status and water intake among older adults. *NHANS 2011-2014. Eur J Nutr*, 59(7), 3133-3148. <https://doi.org/10.1007/s00394-019-03132-9>

Ayotte, D., Jr., & Corcoran, M. P. (2018). Individualized hydration plans improve performance outcomes for collegiate athletes engaging in in-season training. *J Int Soc Sports Nutr*, 15(1), 27. <https://doi.org/10.1186/s12970-018-0230-2>

Mojtabaaghili, S., Shahjoolie, F., Moghadam, M. A., Khazaeipoor, Z., Vaseie, M., & Kia, M. (2018). Relationship between the degree of dehydration in emergency medicine residents at the beginning and end of clinical shifts with cognitive performance, mood, and anxiety at Emam Khomeini Hospital (June 2016 until the end of the same year). *Acta Medica Mediterranea*, 34(Specialissue2), 591-596. [https://doi.org/10.19193/0393-6384\\_2018\\_2s\\_93](https://doi.org/10.19193/0393-6384_2018_2s_93)

Bialecka-Debek, A., & Pietruszka, B. (2019). The association between hydration status and cognitive function among free-living elderly volunteers. *Aging Clin Exp Res*, 31(5), 695-703. <https://doi.org/10.1007/s40520-018-1019-5>

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### Summary of the Literature:

- ❖ Literature proposed that mild to moderate dehydration (loss of more than 2% body mass loss) impairs mental function (Wittbrodt & Millard-Stafford, 2018).
- ❖ However, the current literature has not consistently supported this proposition (Goodman et al., 2019).

Millard-Stafford, M., & Wittbrodt, M. T. (2018). Effect Of Dehydration On Cognitive Functions: A Meta-analysis. *Medicine and Science in Sports and Exercise*, 50(5), 341-344.

Goodman, S. P. J., Moreland, A. T., & Marino, F. E. (2019). The effect of active hypohydration on cognitive function: A systematic review and meta-analysis. *Physiology & Behavior*, 204, 297-308. <https://doi.org/10.1016/j.phybeh.2019.03.008>

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## PICO Question:

<b>P</b> (population)	Mental healthcare providers at a clinic in Miami, Florida who are subjected to pre-test.
<b>I</b> (intervention)	An educational intervention on adequate hydration
<b>C</b> (comparison)	The same mental healthcare providers who were subjected to post-test
<b>O</b> (outcome)	Improve self-efficacy, attitudes and awareness among healthcare providers regarding adequate hydration in mental health patients as stated by a scoring system

### PICO Clinical Question

Is there a change in the self-efficacy, attitudes, and awareness of mental health providers at the behavioral health clinic in Miami concerning pre- and post-educational intervention on adequate hydration?

## Theoretical Framework:

This DNP project will adopt Bandura's self-efficacy theory as the framework (Bandura, 1999; Ozer, 2022).

Bandura, A. (1999). Social cognitive theory of personality. The coherence of personality: Social cognitive bases of consistency, variability, and organization, 185-241.  
Ozer, E. M. (2022). Albert Bandura (1925-2021). American Psychologist, 77, 483-484. <https://doi.org/10.1037/amp0000981>

## Methodology:

### • Participants:

- Mental health care providers encompassing licensed mental health counselors (LMHC), licensed clinical social workers (LCSW), psychiatric nurse practitioners (PMHNP-BC), psychologists, and psychiatrist.

### • Research design:

- This QIP utilized one group pre-and post-test design. The QIP aims to increase the healthcare providers' self-efficacy, attitudes, and awareness of adequate hydration.

## Methodology:

### • Procedure:

- 1- Emails were sent to the potential participants inviting them to attend the treatment team meeting.
- 2- The meeting room was prepared.
- 3- The aim and objective of the DNP project was discussed. An informed consent was signed voluntarily.
- 4- The questionnaire was distributed to the attendees (now, the participants).
- 5- The intervention was delivered via an educational voiceover PowerPoint presentation for nearly 30 min.
- 6- The DNP student trained, observed the participants and responded to inquiries.
- 7- In the second assessment phase, after the intervention, the DNP student administered the post-intervention questionnaire to the participants in QIP.

## Methodology:

### • Protection of Human Subjects :

- Institutional Review Board (IRB) approval was acquired from Florida International University (FIU), Miami, Florida, USA.
- The DNP student obtained authorization to carry out the QIP from the nursing controlling team at the residential behavioral health clinic for women and children in Miami, Florida, USA.

## Methodology:

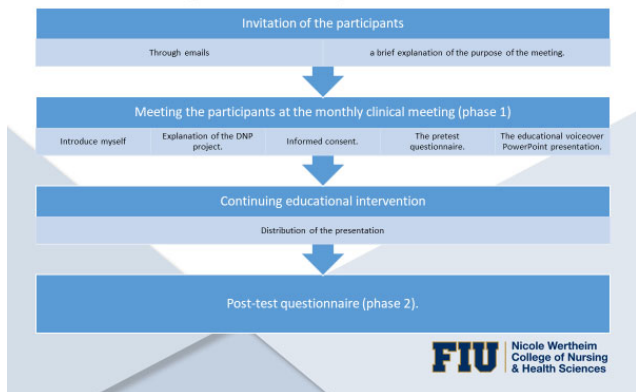
### • Data collection:

- 1- The socio-demographic data.
- 2- The pre-test and post-test questionnaires will collect data about the self-efficacy, attitudes, and awareness of the participants regarding dehydration.

### • Data analysis:

- Data confidentiality and safety was ensured. Data was stored securely.
- Data was analyzed by the IBM SPSS software package (version 29, New York, NY, USA).
- Dependent paired t-test
- Pearson correlation coefficient (r)
- McNemar's chi-square test.

### Flow Diagram of the Project and Intervention



Final Sample Demographic Characteristics (N=13)

Variable	Frequency	Percent
Gender		
Male	10	76.9
Female	3	23.1
Ethnicity		
Hispanic	10	76.9
White non-Hispanic	2	15.4
Other	1	7.7
How do you work (health provider)		
Nurse Practitioner	7	53.8
RN	4	30.8
LPN	2	15.4
Other	1	7.7
Education level		
Bachelor's	5	38.5
Master's	7	53.8
Other	1	7.7
Certified medical assistant (yes/no)		
Yes	10	76.9
No	3	23.1
Additional certifications		
Yes	7	53.8
No	6	46.2
Employed outside of your institution		
Yes	11	84.6
No	2	15.4
No answer	1	7.7

### QI RESULTS

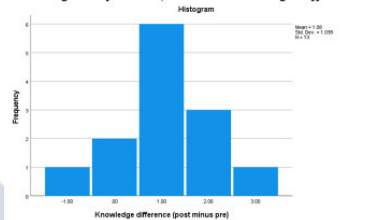
- A paired samples t-test of the change in knowledge of pre- and post- test was **statistically significant p=.003** indicating there was a significant increase in knowledge following the educational intervention.

Descriptive Statistics for Correct Answers on Knowledge Questions Pre/ Posttest N=13

Variable	Mean	Std. Deviation
Knowledge pretest correct answers	4.23	1.17
Knowledge posttest correct answers	5.31	1.32

### QI RESULTS

Histogram of Pretest/Posttest Knowledge Difference Scores (N=13)



### Discussion

#### Limitations:

- Small sample size, only 13 participants completed both pre and post test questionnaires
- Staff turnover throughout study necessitating a change in the data collection format, which caused delays with IRB approval
- Short staffing issues
- Innovation fatigue of staff: too many practice change initiatives

### Discussion

#### Implications to Advanced Practice Nursing:

- Significant enhancement of healthcare providers self-efficacy, attitudes and awareness regarding adequate hydration significantly improving the quality of healthcare delivery
- Ensuring the significance of continuous education and in-practice training for leveling up the quality of care provided by healthcare providers.
- Enhancing collaboration between administration, healthcare providers, ancillary personnel, and clients in order to improve healthcare quality.
- Incorporating the evidence-based hydration care as a standard in the behavioral clinic in Miami and to other affiliated facilities.

## Discussion

### Healthcare Delivery, Outcomes, & Policy:

- Results of QIP can enhance healthcare delivery by improving and streamlining the knowledge base of the healthcare providers.
- Healthcare providers reported feeling empowered to assist residents in reaching optimal hydration status through the education they received.
- Evidence-based practices that improve the quality of healthcare delivery have far reaching consequences through policy changes within the facility, other facilities, and the community at large.

## CONCLUSIONS

- The aim of the Quality Improvement Project (QIP) was to implement and evaluate an evidence based educational intervention on the science behind adequate hydration.
- A descriptive statistical analysis of pre and post test survey responses yielded that participants answered significantly more hydration knowledge questions correctly after the intervention.
- Results for individual question pairings revealed favorable effects on knowledge and self-efficacy.
- Ultimately the educational intervention has shown to be a valuable resource for healthcare providers.

## CONCLUSIONS

- The finding of this QIP illuminate the importance of further educational interventions to enhance the knowledge and self-efficacy of healthcare providers.
- Addressing knowledge gaps with evidence-based educational resources and changes to existing policies will improve the quality of healthcare delivery.
- A perpetual curiosity for improving healthcare quality delivery systems is a continuous evolving process, there is no endpoint.

## THANK YOU and ACKNOWLEDGEMENTS

A heartfelt THANK YOU goes out to my preceptor Dr Venus Miller and all of the staff at the clinical site, without you this QIP would not have been possible.

A HUGE THANK YOU goes out to my professor Dr Michael Sanchez for his kind direction, guidance, and patience during one of the roughest periods of my life to complete this project.

Also, a huge thank you to the staff of the FIU graduate nursing department for their hard-working coordination to ensure everyone's needs are met.

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**Questions?**

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**Thank You!**

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