

Effectiveness of Online Nutrition Course on Emotional Health and Energy levels

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ABSTRACT

Background: Rates of mental health disorders have rapidly increased over the past decades. It is thought that 1 in 4 adults will experience a mental health disorder each year.¹ Emerging evidence suggests a positive association of unhealthy diet habits and obesity with depression.² On the other hand, there is growing evidence that a diet higher in fruit and vegetable consumption can help improve emotional health and energy status.^{3,4,5}

Objective: To evaluate the effectiveness of an Online Nutrition course designed to improve dietary habits, emotional health and energy status.

Design: Quasi-experimental

Setting: Virtual/ Online

Participants: SUNY Empire State College employees.

Intervention: Study subjects were instructed to complete an online course, Nutrition Essentials. Subjects were also instructed to complete 15 logs (3 logs per week) tracking their regular dietary habits.

Methods: Dietary habits and sleeping patterns were tracked using the ASA24 database. Nutrition analysis focused on fruit and vegetable intake. Change in emotional health/energy statuses was evaluated by comparing the results of the pre and post intervention SF-36 Health Questionnaires. Descriptive statistics, such as means \pm standard deviations, were used to present the demographic characteristics of the study participants. Repeated measures ANOVA and paired t-tests were used to compare continuous variables. Wilcoxon rank-sum test was used to compare differences in ordinal variables. A *P* value of < 0.05 was considered statistically significant. All statistical analyses were performed using SPSS 22.0, (SPSS, Inc., Chicago, IL, USA).

Results: The intervention was effective in increasing energy/fatigue scores in those who completed the intervention ($P = 0.0004$). All other results were not considered statistically significant.

Conclusion: Future studies on this topic should utilize the randomized clinical trials method (intervention vs. control group). Future intervention groups should be instructed to consume 5 servings of fruits and vegetables each day to fully assess if they have an impact on mood/energy status.

INTRODUCTION

- Emotional and mental health play an essential role on an individual's overall health.
- Individuals who are considered "emotionally healthy" are thought to have better control over their thoughts, feelings, behaviors and life challenges.²
- Mood disorders, such as anxiety and depression, are the most common mental illnesses in the United States.²
- Diet, physical activity, lifestyle factors, social history, personal relationships are all thought to impact emotional and mental health.
- In recent years, more evidenced based research studies have focused on our diets' impact on emotional/ mental health.
- A common theme among these articles showed that a diet high in saturated fat, trans fat and refined sugar, had a negative impact on mental health, emotional health and sleeping patterns as well as sleeping habits.^{4,5}
- Obesity and diets consisting of food of a high glycemic index have also been found to have a positive association with anxiety and depression.³
- The purpose of this study was to evaluate the effectiveness of an Online Nutrition course designed to improve dietary habits, emotional health and energy status.

METHODS

- Participants:** 50 employees from SUNY Empire State College were recruited for the purpose of this study. 29 completed the entirety of the intervention (58%).
- Intervention:** SF-36 Health Survey administered at the beginning and at the end of the 5-week intervention period
- International Physical Activity Questionnaire administered at the beginning of the 5-week intervention period
- Microsoft Forms was used to collect the information for both questionnaires. The link to the Forms survey was sent out via email.
- ASA24 collects dietary intake and sleep pattern information.
- Participants were instructed to complete 3 logs a week (total of 15 by the end of the intervention).
- Participants were also instructed to complete the online course, called Nutrition Essentials developed by the American Society for Nutrition (ASN).
- Nutrition Essentials consists of 13 modules. The course focuses on evidence-based nutrition recommendations; skillfully integrates content to facilitate active learning; and includes activities to assess knowledge.
- Researchers hosted weekly meetings with participants to discuss that week's assigned modules. This was also a place for participants to discuss how they were doing throughout the course of the intervention.
- Data collection:** Descriptive statistics, such as means \pm standard deviations and frequencies, was used to present the demographic characteristics of the study participants.
- SF-36 Questionnaire was scored using the accredited SF-Questionnaire scoring rubric. Paired t-tests were used to compare changes in continuous variables. The Chi-square test was used to compare differences in dichotomous variables.

RESULTS

- Seven participants withdrew from the study.
- Fourteen participants did not complete the SF-36 Health Survey, the Automated Self-Administered 24-Hour Dietary Assessment Tool (ASA24) and the International Physical Activity Questionnaire (IPAQ).
- A total of 29 participants completed the study protocol's SF-36 Health Survey, the ASA24 with the sleep module and the IPAQ.
- Of the 29 participants, 35% (n=10) completed 100%, 7% (n = 2) completed 75%, 44% (n = 13) completed less than 50%, and 14% (n = 4) never started the Nutrition Essentials four-week online course, respectively.

Demographic Characteristics:

- The baseline characteristics of the 29 participants included in the final data are presented in Table 1. Participants were obese as determined by body mass index. The IPAQ showed that 72% (n = 21) of participants were minimally active and 28% (n = 8) were active.

Table 1. Characteristics of study participants at baseline¹

Variable	Total	Women	Men
Age (years)	52.5 \pm 10.3	51.2 \pm 10.3	59.0 \pm 7.7
Height (inches)	65.2 \pm 3.9	64.1 \pm 3.0	70.9 \pm 2.1
Weight (pounds)	192.4 \pm 49.2	183.6 \pm 39.9	234.6 \pm 71.5
Body mass index (kg/m ²)	32.0 \pm 8.0	31.7 \pm 7.2	33.3 \pm 12.1

¹All values are means \pm SD; n = 29 (24 women, 5 men).

RESULTS CONTINUED

Fruit and Vegetable Intake:

- Fruit and vegetable intake were not significantly different after the four-week online nutrition intervention (shown in table 2).

Table 2. Participant fruit and vegetable intake¹

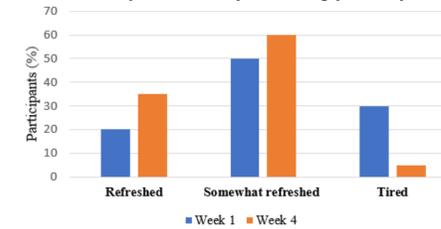
	Week 1	Week 2	Week 3	Week 4	<i>P</i>
Fruit servings	0.6 \pm 0.5	0.9 \pm 0.9	1.0 \pm 0.7	1.0 \pm 0.7	0.242
Vegetable servings	1.8 \pm 1.1	1.7 \pm 1.0	1.8 \pm 0.9	1.8 \pm 1.2	0.795

¹All values are means \pm SDs; statistical comparisons were made by repeated measures ANOVA; n = 29 (24 women, 5 men).

Sleep Patterns:

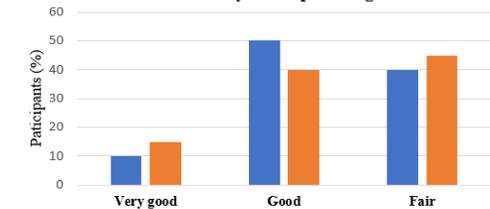
- Hours of sleep were not significantly different at the end of the intervention ($P = 0.842$).

How did you feel when you woke up yesterday?



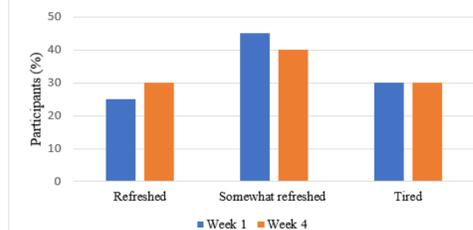
- Figure 1. How did you feel when you woke up yesterday? From the ASA24 sleep module; statistical comparisons were made by Wilcoxon rank-sum test; n = 29 (24 women, 5 men). 80% of participants reported feeling "Somewhat refreshed" and "Refreshed" at the one-week mark vs. 95% at the four-week mark. $P = 0.066$.

How well did you sleep last night?



- Figure 2. How well did you sleep last night? from the ASA24 sleep module; statistical comparisons were made by Wilcoxon rank-sum test; n = 29 (24 women, 5 men). 60% of participants reported feeling "Very good" and "Good" at the one-week mark vs 55% at the four-week. $P = 0.929$.

How did you feel when you woke up today?



- Figure 3. How did you feel when you woke up today? From the ASA24 sleep module; statistical comparisons were made by Wilcoxon rank-sum test; n = 29 (24 women, 5 men). 70% of participants reported feeling "Somewhat refreshed" and "Refreshed" at both the one-week mark as well as the four-week mark. $P = 0.839$.

RESULTS CONTINUED

Health Survey:

- Higher scores of the SF-36 Health Survey indicate a more favorable health state.
- The energy/fatigue category was significantly improved after the four-week online nutrition intervention ($p = 0.0004$).
- Other categories in the SF-36 Health Survey showed no statistically significant differences (Table 3).

Table 3. SF-36 Health Survey¹

	Week 1	Week 4	<i>P</i>
Physical functioning	83 \pm 22	89 \pm 18	0.08
Role limitations due to physical health	87 \pm 26	88 \pm 28	0.703
Role limitations due to emotional problems	79 \pm 36	79 \pm 31	0.902
Energy/fatigue	49 \pm 20	59 \pm 18	0.0004
Emotional well being	74 \pm 12	73 \pm 14	0.605
Social functioning	86 \pm 19	84 \pm 24	0.598
Pain	82 \pm 18	80 \pm 19	0.59
General health	66 \pm 16	69 \pm 16	0.427

¹All values are means \pm SDs; statistical comparisons were made by paired t-tests; n = 29 (24 women, 5 men).

Discussion/Conclusion

- This intervention was effective in increasing energy/fatigue scores in those who completed the intervention ($P = 0.0004$).
- There were no statistically significant changes in emotional health or fruit/ vegetable intake by the end of this intervention.
- Participants stated that they were more mindful of how much they slept at night/ what they ate during the day secondary to this intervention. However, there was no notable change in sleeping or eating habits
- Difficult to determine what attributed to positive change in energy levels.
- Evidenced based peer reviewed studies that were evaluated for the purpose of this study indicated that a change in diet habits did have a positive impact on emotional health and energy status.
- One study found that a diet higher in fruits, veggies, fiber and healthy fats increased hours slept at night by 2 hours.³
- Another study found that a diet high in refined sugars has been linked to cognitive impairments, negative neuroplasticity and emotional disorders like anxiety and depression.^{4,5}
- Strengths of study:** tools that were for the purpose of this study were reliable and validated tools.
- Participants reported learning new information regarding nutrition.
- Weaknesses of study:** potential for recall bias for ASA24 logs.
- Participation gradually declined throughout the study.
- Concluding remarks:** future studies should instruct the intervention groups of their studies to consume at least 5 servings of fruits and vegetables to determine if they have an impact on energy levels and emotional health.

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