Although it is impossible to objectively measure overall diet quality (DQ), it is possible to objectively measure fruit and vegetable (FV) consumption, an important component of overall DQ, via skin carotenoid status (SCS). Higher FV consumption may correlate with overall DQ; therefore, measuring SCS may be an effective way to provide insight into overall DQ. Improving insight into overall DQ through objective measures may improve the assessment DQ, which may be especially useful when developing and assessing the effectiveness of nutrition education programs designed to improve DQ. To determine how SCS may relate to components of DQ, researchers collected 311 adolescents’ SCS and administered the Short Healthy Eating Index (sHEI) food frequency questionnaire (FFQ). Pearson’s R Correlations were used to measure the correlation between reported consumption of food groups and SCS scores. SCS was positively correlated with consumption of whole fruits, fruit juice, green vegetables, legumes, and seafood. SCS was negatively correlated with added sugar and saturated fat intake. Since it is necessary to properly understand DQ in order to develop effective nutrition education programs, assessing SCS may be an effective way to provide objective insight into overall DQ.

Background

SCS is an indirect, objective measure of FV intake. SCS is a measure of carotenoids consumed that have sequestered in skin tissue (1). Some foods that contain carotenoids include carrots, tomatoes, and green leafy vegetables (2).

Methods

Data were collected from 311 high school students enrolled in a Culinary Arts or Agriscience class across four high schools in central Florida during the spring and fall semesters of 2021. Adolescents completed a demographic questionnaire and the Short Healthy Eating Index (sHEI) FFQ. SCS was collected in triplicate on the index finger using resonance Raman spectoscopy via the Veggie Meter® (pictured on the left). Data were analyzed cross-sectionally. Demographics were analyzed using frequencies. Relationships between self-reported consumption of food groups and SCS were determined using Pearson’s R correlations. Average FV consumption and SCS were also calculated and reported.

Results

A weak positive correlation was found between SCS and self-reported consumption of seafood, beans and legumes, whole fruit, green vegetables, and fruit juice.

Conclusions

SCS was negatively correlated with consumption of added sugars and saturated fat.

Adolescents with higher SCS report higher DQ.

Since self-reported DQ assessments are prone to bias, utilizing SCS to provide insight into overall DQ may be beneficial.

Additional, affordable, and accessible objective measures of dietary intake are needed.

References