

## Background

Positive wellbeing can ease the transition from adolescents to adulthood and may buffer against a variety of negative outcomes including psychological disorders<sup>1</sup>. Subjective wellbeing (SWB) can be assessed by an evaluative element such as life-satisfaction<sup>2</sup>. Life-satisfaction is a positive dimension of mental health and a cognitive component of SWB.

There is compelling evidence in adults that nutrition is a crucial factor in the high prevalence and incidence of mental disorders<sup>3</sup>.

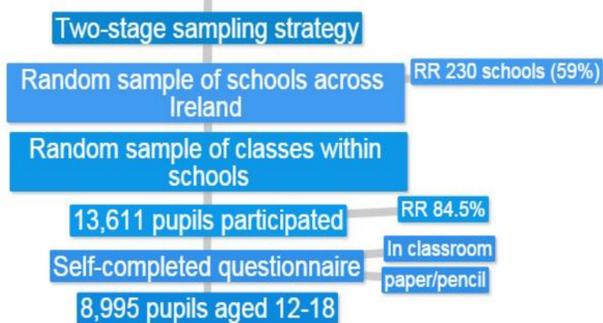
Fruit and vegetables are seen as markers of healthy diets whereas consumption of sugar sweetened beverages are seen as markers of poor diet quality. It is important to find modifiable determinants of wellbeing which may increase life-satisfaction and positive mental health.

## Objective

To investigate whether markers of diet quality are associated with SWB in adolescents aged 12-18.

## Methods

### Health Behaviour in School-aged Children (HBSC) Study



## Measures of wellbeing

Wellbeing was assessed by a question on general health

1) would you say your health is ... and response options were; i) excellent, ii) good, iii) fair, or iv) poor, recoded as good (excellent/good) and poor health (fair/poor).

2) and by a measure of life-satisfaction; here is a picture of a ladder: the top of the ladder '10' is the best and the bottom '0' is the worst possible life for you. In general where on the ladder do you feel you stand? This variable was dichotomised at  $\geq 7$  as high life-satisfaction and  $< 7$  as low life-satisfaction.

**Diet quality:** Frequency of consumption of 1) Fruit 2) Vegetables and 3) Soft drinks that contain sugar. Response options were i) never, ii) less than once a week, iii) once a week, iv) 2-4 days a week, v) 5-6 days a week, vi) once a day, everyday, vii) everyday more than once. Each of the food groups were recoded as daily versus less than daily consumption

**Demographics:** gender (boy/girl) and age-group (12-13, 14-15, 16-18) and parental occupation (highest parental occupation recoded as social-class 1-2, 3-4 and 5-6).

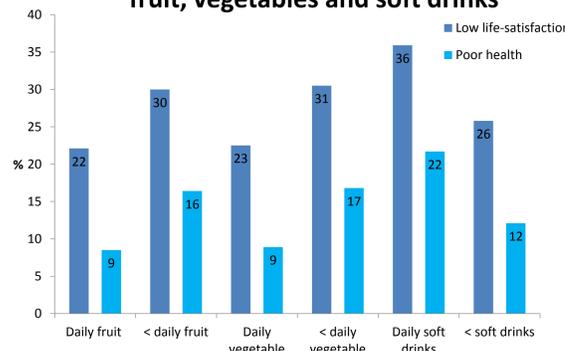
**Leisure time:** physical activity (recoded as 7 days versus  $< 7$  days)<sup>4</sup>, total screen-time (watching TV and on computers), dichotomised as  $< 2$ hours/day versus  $\geq 2$ hours/day<sup>5</sup>.

**Risk behaviours:** risk behaviour index based on 5 risk behaviours (smoking in last 30 days, cannabis use in last 12 months, drank alcohol in last 30 days, ever been drunk, and used a condom last time had sexual intercourse) recoded as no risk, some risk and high risk<sup>6</sup>.

**Relationships:** whether ever been bullied at school or via cyber bullying<sup>7</sup>. Family support and peer support were assessed using the family and friends questions from the multidimensional scale of perceived social support<sup>8</sup>.

**Statistical analysis:** summary statistics were examined. Differences were assessed using chi-square test. Separate binary logistic regression (unadjusted and adjusted\*) explored the associations between measures of SWB and markers of diet quality. \* see footnote Table 1

Figure 1: Low life-satisfaction and poor health by frequency of consumption of fruit, vegetables and soft drinks



## Results

Overall 26.9% of adolescents rated their life-satisfaction as low and 13.4% self-rated their health as fair/poor. Older adolescents report fair/poor health more frequently than younger adolescents 15.7% vs.10.3% ( $p < 0.001$ ). Girls report poor health more frequently than boys (15.3% vs. 10.6% ,  $p < 0.001$ )

Similar age and gender differences were found for life-satisfaction, 17.9% of 12-13 year olds vs. 34.8% of 16-18 year olds ( $p < 0.001$  and rating  $< 7$  on Cantril ladder). Girls reporting low life-satisfaction more frequently than boys (and 30.7% vs. 21.4%  $p < 0.001$ ).

A lower proportion of adolescents report daily consumption of fruit and vegetables compared to less than daily (39.0 % for fruit and 44.7% vegetables). A lower proportion also consumed soft drinks daily compared to less than daily (12.8%).

**Figure 1** illustrates the prevalence of low life-satisfaction and poor health is higher in those reporting they **do not** consume of fruit or vegetables daily and higher in those reporting consumption of **soft drinks daily**.

## Key findings

Adolescents who **do not** consume fruit or vegetables daily and who drink **soft drinks daily** are at a higher odds of poor wellbeing

Table 1: Unadjusted and adjusted models of wellbeing and diet quality

	Poor General health		Low Life-satisfaction	
	Model 1a	Model 1b	Model 2a	Model 2b
OR (95% CI)				
< Daily Fruit	2.13 (1.85 2.45)	1.76 (1.48 2.10)	1.51 (1.36 1.67)	1.35 (1.18 1.54)
< Daily Vegetables	2.06 (1.81 2.36)	1.83 (1.54 2.16)	1.51 (1.37 1.67)	1.34 (1.18 1.53)
Daily Soft drinks	2.01 (1.71 2.35)	1.62 (1.30 2.02)	1.61 (1.41 1.85)	1.45 (1.20 1.76)

- Model1a general health and diet quality unadjusted
- Model1b general health and diet quality fully adjusted
- Model2a life-satisfaction and diet quality unadjusted
- Model2b life-satisfaction and diet quality fully adjusted
- \* **Adjusted** for age, gender, parental social-class, physical activity, total screen time, risk behaviour index, being bullied, family and peer support.
- **Reference categories** excellent/good health, high life-satisfaction, daily fruit, daily veg, less than daily soft drinks

## Results continued

**Table 1** shows that those who **do not** consume fruit or vegetables daily are at a significantly higher odds of low life-satisfaction and poor general health, compared to those who eat fruit or vegetables daily. Those who report consumption of **soft drinks daily** are also at a significantly higher odds of poor wellbeing indicators even after controlling for important confounders.

## Discussion/conclusion:

- The results suggest that eating a good quality diet may protect from poor wellbeing.
- As this study is cross-sectional the relationship between life-satisfaction or general health may plausibly be **bi-directional**. However longitudinal studies with similar population characteristics have found that the consumption of fruit or vegetables/healthy diets preceded the positive affect on SWB<sup>9,10</sup> therefore supporting our findings that eating a good quality diet is positively associated with good wellbeing.
- Adolescence is a time of greater food independence and opting for more ultra-processed foods low in nutritional value. Suggesting the impact of poor diet quality on wellbeing should be emphasised
- Creating environments that support healthier dietary choices is key to enable good general health and wellbeing.

## References

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