

Systematic review of the effects of family meal frequency on psychosocial outcomes in youth

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Abstract

Objective To conduct a systematic review of the effects of frequent family meals on psychosocial outcomes in children and adolescents, and to examine whether there are differences in outcomes between males and females.

Data sources Studies were identified through a search of MEDLINE (1948 to fifth week of June 2011) and PsycINFO (1806 to first week of July 2011) using the Ovid interface. The MeSH terms and key words used both alone and in combination were *family, meal, food intake, nutrition, diets, body weight, adolescent attitudes, eating behaviour, feeding behaviour*, and *eating disorders*. Bibliographies of papers deemed relevant were also reviewed.

Study selection The original search yielded 1783 articles. To be included in the analysis, studies had to meet the following criteria: have been published in a peer-reviewed journal in English; involve children or adolescents; discuss the role of family meals on the psychosocial outcomes (eg, substance use, disordered eating, depression) of children or adolescents; and have an adequate study design, including appropriate statistical methods for analyzing outcome data. Fourteen papers met inclusion criteria. Two independent reviewers studied and analyzed the papers.

Synthesis Overall, results show that frequent family meals are inversely associated with disordered eating, alcohol and substance use, violent behaviour, and feelings of depression or thoughts of suicide in adolescents. There is a positive relationship between frequent family meals and increased self-esteem and school success. Studies show substantial differences in outcomes for male and female children and adolescents, with females having more positive results.

Conclusion This systematic review provides further support that frequent family meals should be endorsed. All health care practitioners should educate families on the benefits of having regular meals together as a family.

EDITOR'S KEY POINTS

- This systematic review found that eating frequent family meals was associated with better psychosocial outcomes for children and adolescents. Frequent family meals were inversely associated with disordered eating, alcohol and substance use, violent behaviour, and feelings of depression or thoughts of suicide. There was a positive relationship between frequent family meals and increased self-esteem and commitment to learning or a higher grade point average.
- Findings also highlighted that females seemingly gained more protective effects from frequent family meals than males did.
- Given that psychosocial dysfunction is one of the most common chronic conditions among children and adolescents, health care practitioners should educate families on the benefits of having regular meals together. In addition, practitioners should explore any obstacles that might exist to having family meals and discuss potential strategies for their implementation.



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Psychosocial dysfunction has become widely acknowledged as the most common chronic condition among children and adolescents.^{1,2} Given that adolescents' psychosocial health problems have implications for adult morbidity, mortality,³ and development of other diseases,^{4,5} investigating methods that affect and alter the course of these issues merits attention. Adolescents' healthy development is influenced by myriad family factors.⁶ Healthy family environments, including family connectedness (ie, feelings of love, warmth, and caring from parents) have been found to be protective against poor mental health or psychosocial outcomes, and the role of the family has long been studied as an important contribution to adolescent well-being.⁷⁻⁹ Interestingly, there is evidence that young males might respond differently than females do to family environments and dynamics.¹⁰⁻¹³

A simple, nonintrusive intervention that could easily be applied to increase healthy family environments is engaging in family meals. Family meals might serve as an arena for augmenting family cohesion,¹⁴⁻¹⁶ stability,¹⁷ and connectedness,⁸ or for enhancing adolescent developmental assets,¹⁸ such as problem-focused coping¹⁵ and social-emotional development.⁸ Moreover, family rituals and routines, like the family meal, might offer consistency and a venue for checking in with family members, and for learning and teaching healthy food behaviour and attitudes.¹⁹

Recent interest has been dedicated to investigating the importance of family meals and their positive effects on child and adolescent nutritional outcomes. Current research suggests that eating meals together as a family is beneficial to adolescents' eating habits and that more frequent family meals have been found to lead to better dietary intake among children and adolescents.²⁰⁻²⁵ Several studies have also examined the relationship between family meals and children being overweight or obese with inconsistent results.²⁶⁻²⁹ One study reported that a higher frequency of family meals was associated with reduced odds of being overweight and of becoming overweight in the future,²⁶ while other reports found that the frequency of family dinners was inversely associated with overweight status at baseline, but not with the likelihood of becoming overweight in the future.^{27,28}

Researchers have also begun to study the role of family meals on markers of adolescent well-being, such as rates of substance use and disordered eating behaviour.^{19,30} These studies appear to vary in design and scope. A recent review by Skeer and Ballard looking at family meals and adolescent risk prevention showed a generally positive relationship between frequent family meals and decreased adolescent engagement in risk behaviour.³¹ The review also mentioned that adolescents' sex had a substantial role in this

relationship; sex seemed to influence the strength of family meals' protective effects on risk behaviour, with female adolescents benefiting more than male adolescents did.

To our knowledge, no systematic review has been completed on the relationship between family meals and psychosocial outcomes in children and adolescents. As such, the purpose of this paper was to conduct a systematic review of the effects of family meals on psychosocial outcomes in children and adolescents, and to examine whether differences in outcomes between males and females have been studied. A study of this nature has the potential to increase knowledge of the importance of frequent family meals while providing evidence in support of an easy-to-implement prevention strategy or adjunctive treatment intervention.

DATA SOURCES

Studies were identified through a MEDLINE search (1948 to the fifth week of June 2011) and PsycINFO (1806 to first week of July 2011) using the Ovid interface. No date, language, age, or study design limits were imposed on the search. The bibliographies of papers deemed relevant were also reviewed for further relevant papers.

Study selection

To be included in the analysis, studies had to meet the following criteria: have been published in a peer-reviewed journal in English; involve children or adolescents; discuss the role of family meals on the psychosocial outcomes (eg, substance use, disordered eating, depression) of children or adolescents; and have an adequate study design that allowed for the relationship between family meals and psychosocial outcomes to be studied directly, including cross-sectional or longitudinal cohort studies and randomized control trials. Case studies, commentaries, and narrative reviews were excluded. Additionally, study design had to include appropriate statistical methods for analyzing outcome data. As the purpose of this review was to assess the effects of family meals on the psychosocial health outcomes of children and adolescents, studies were excluded if they only focused on the effect of family meals in the context of treatment, such as for eating disorders.

Two authors (M.H., H.W.) reviewed and compared the studies that met inclusion criteria for the following: study purpose, study sample and demographic characteristics, study design (longitudinal vs cross-sectional), and effect of family meals on outcomes measured ($P \leq .05$ was used to determine significance). The

studies were categorized according to the specified outcomes assessed, as well as differences between males and females.

SYNTHESIS

Figure 1 describes the articles that were identified, excluded, and included. Fourteen articles (7 longitudinal and 7 cross-sectional studies) met inclusion criteria (Table 1).^{15,16,18,19,30,32-40} These 14 articles were based on 9 different subject samples. Five of the papers (3 longitudinal, 2 cross-sectional) used data from Project EAT-I

(Eating Among Teens) or EAT-II,^{19,36,38-40} and 2 longitudinal papers collected data from the Growing Up Today Study project.^{30,32} Other study data sources included the National Heart, Lung, and Blood Institute Growth and Health Study¹⁵ and the Controlling Overweight and Obesity for Life study.³³ The remainder of the data were from individual studies. However, there is no duplication of data among these publications, as each article reviewed a different outcome or a specific group of the subject sample. Table 1^{15,16,18,19,30,32-40} shows the data sources, data collection methodology, study response rates, and demographic information. Table 2^{15,16,18,19,30,32-40} presents main findings of the studies reviewed.

Figure 1. Systematic review process: Articles that were identified, excluded, and included.

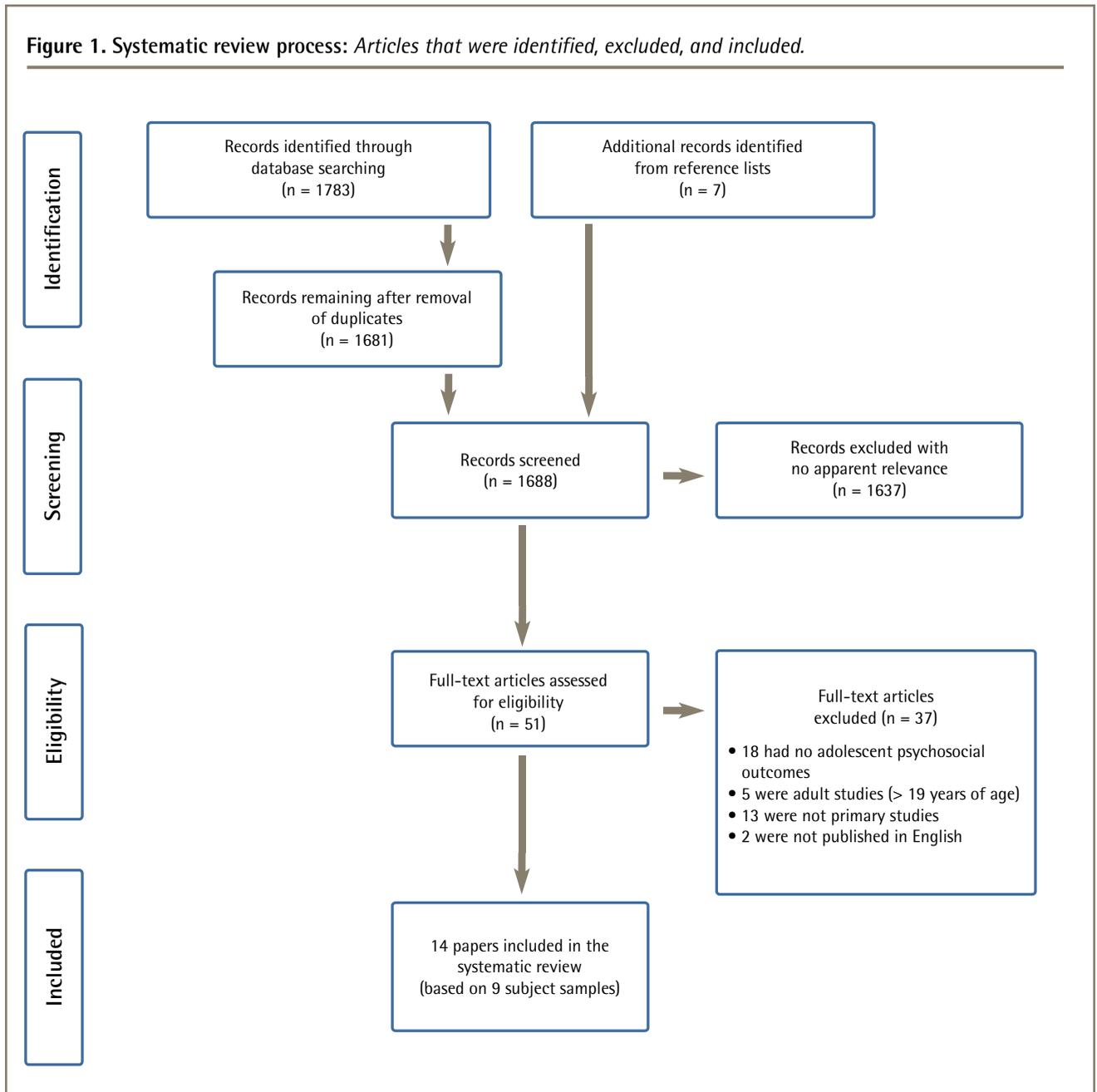


Table 1. Design and characteristics of studies reviewed

STUDY	N VALUE	DATA SOURCE AND SETTING	PARTICIPANT CHARACTERISTICS	STUDY DESIGN	OUTCOMES MEASURED	DEFINITION OF FFM	PSYCHOSOCIAL MEASURES
Franko et al, ¹⁵ 2008	2379	Girls from California, Cincinnati, and Maryland aged 9 or 10 y at study entry who participated in the NGHS	Girls only Mean age at the start of the study was 9.5 y Mean age at 10 y was 18.6 y	Longitudinal data collected annually for 10 y as part of the NGHS Measures administered in alternating years Participant retention at 10 y was 89% Family meals data were obtained at 1 y and 3 y and the main outcome measures were obtained at 5 y, 6 y, and 10 y	Disordered eating behaviour, body image concern, and substance use	"How often do you eat with your parent(s)?" FFM not defined	EDI—the drive for thinness, body dissatisfaction, and bulimia subscales Perceived Stress Scale Family Adaptability and Cohesion Evaluation Scale III—the cohesion subscale Coping Strategies Inventory Various questions to assess FMF and demographic characteristics
White and Halliwell, ¹⁶ 2010	550	Students (aged 11–16 y) in grades 7, 9, and 10 from comprehensive state schools based in an urban area of the UK	Ethnically and socioeconomically diverse Males (n = 274), females (n = 276) Mean (SD) age was 14.13 (1.09) y	Cross-sectional data collected Sex, date of birth, height, weight, and parental employment were self-reported by participants Self-reported questionnaires were used to assess FMF, family connectedness, family mealtime environment, and alcohol and tobacco consumption	Substance use	"During the past seven days, how many times did all, or most, of your family living in your house eat a meal together?" FFM defined as ≥ 5 times per wk	Family Eating Attitudes and Behavior Scale Various questions to assess demographic characteristics, FMF, familial factors, and alcohol and tobacco consumption
Fulkerson et al, ¹⁸ 2006	99 462	Students in grades 6–12 from public and alternative schools in the US (213 cities, 25 states)	Ethnically diverse Males (n = 49 138), females (n = 49 620)	Cross-sectional data collected during the 1996–1997 school year Profiles of student life; Attitudes and Behaviors survey administered in classrooms by participating school districts	Disordered eating behaviour, depressive symptoms or suicidality, self-esteem, academic achievement, substance use, and violent behaviour	7 times per wk	Profiles of student life; Attitudes and Behaviors survey Various questions chosen to assess substance use, depressive symptoms, suicidality, violence, academic problems, FMF, and demographic variables
Neumark-Sztainer et al, ¹⁹ 2004	4746	Adolescents from the urban and suburban school districts of Minneapolis who participated in Project EAT	Ethnically diverse Males and females Mean (SD) age was 14.9 (1.7) y	Cross-sectional data collected during the 1998–1999 school year Project EAT survey administered by staff (RR 81.5%); height and weight assessed	Disordered eating behaviour	"During the past 7 days, how many times did all, or most, of your family living in your house eat a meal together?" FFM defined as ≥ 5 meals per wk	Specific questions developed for the Project EAT study were based on adolescent focus group findings, a review of existing instruments, expert revisions, a social-cognitive theoretical framework, and pilot tests
Fisher et al, ³⁰ 2007	5511	Cohort of children who participated in GUTS across the US GUTS participants are the children of women taking part in the Nurses' Health Study II	Males (n = 2228), females (n = 3283) Age range was 11–18 y	Longitudinal data collected in 1996 and in 1998 and 1999, examining predictors of alcohol initiation and binge drinking Starting in 1996, GUTS follow-up self-report questionnaires were mailed to participants annually In 1998 and 1999, the alcohol use section of the questionnaire was expanded and administered to participants (RR 70%)	Substance use	"How often do you sit down with other members of your family to eat dinner or supper?" FFM not defined	Alcohol Expectancy Questionnaire—adolescent version Harter Self-Perception Profile for Children Various questions to assess demographic, family, and social context variables, and alcohol use behaviour

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STUDY	N VALUE	DATA SOURCE AND SETTING	PARTICIPANT CHARACTERISTICS	STUDY DESIGN	OUTCOMES MEASURED	DEFINITION OF FFM	PSYCHOSOCIAL MEASURES
Haines et al, ³² 2010	13 448	Cohort of children who participated in GUTS across the US Participants in GUTS are the children of women taking part in the Nurses' Health Study II	Males (n = 5913), females (n = 7535) Mean (SD) age (Time 1) was 11.9 (1.6) y	Longitudinal data collected in 1996, (Time 1, baseline), 1997 (Time 2), 1998 (Time 3), and 1999 (Time 4) Self-administered questionnaires were mailed to participants annually	Disordered eating behaviour	"How often do you sit down with other members of your family to eat dinner or supper?" FFM not defined	Youth Risk Behaviour Surveillance Questionnaire McKnight Risk Factor Survey Various questions to assess variables such as FMF, parental weight teasing, and importance of thinness to parents
Fulkerson et al, ³³ 2009	145	At-risk adolescents from urban and suburban alternative high schools in Minneapolis who participated in the COOL pilot study	Ethnically diverse Males (52%), females (61%) Mean (SD) age was 17.2 (1.2) y	Cross-sectional data collected in 2006 as baseline data for the Team COOL pilot study Trained research staff administered a psychosocial survey to students during class; height and weight measurements were also recorded	Disordered eating behaviour, depressive symptoms, and substance use	"During the past week, how many days did all, or most, of the people you live with eat dinner together?" FFM defined as 5-7 meals per wk	Specific questions came from previously published surveys
Sen, ³⁴ 2010	8984	Youth (aged 12-16 y) who participated in the National Longitudinal Survey of Youth	Nationally representative sample of the US population Youth aged ≤ 14 y as of December 31, 1996, who were living with at least 1 parent Sex numbers not specified	Longitudinal data collected from 1997 to 2000	Substance use and violent behaviour	Youth were asked to report the number of days in a typical week their family ate dinner together FFM not defined	Audio Computer-Assisted Self-Interview
Woodruff and Hanning, ³⁵ 2009	3223*	Students in grades 6-8 from 86 schools across northern and southern Ontario and Nova Scotia	Males (n = 1454), females (n = 1548)	Cross-sectional data collected during the 2005-2006 school year Web-based Food Behaviour Questionnaire was administered (RR varied by region or city and ranged from 34%-98%)	Disordered eating behaviour, body image concern, and self-efficacy	"Typically, how many days per week do you eat dinner or supper with at least one parent?" FFM defined as ≥ 6 d per wk	Food Behaviour Questionnaire Various questions to assess FMF, body image concern, and self-efficacy
Eisenberg et al, ³⁶ 2004	4746	Adolescents from the urban and suburban school districts of Minneapolis who participated in Project EAT	Ethnically diverse Males and females Mean (SD) age was 14.9 (1.7) y	Cross-sectional data collected during the 1998-1999 school year Project EAT survey administered by staff during class (RR 81.5%); height and weight assessed	Self-esteem, academic achievement, depressive symptoms or suicidality, and substance use	"During the past 7 days, how many times did all, or most, of your family living in your house eat a meal together?" FFM defined as ≥ 5 meals per wk	Rosenberg Self-Esteem Scale Various questions to assess FMF, family factors, academic performance, depression, suicidality, and sociodemographic factors
Sierra-Baigrie et al, ³⁷ 2009	259	Secondary school students aged 12 to 21 y from Avilés, a town in northern Spain	Males (58.3%), females (41.7%) Mean age was 14.72 y	Cross-sectional data were collected in the form of various self-reported questionnaires assessing topics including bulimic symptomatology, psychosocial competencies, emotional and behavioural problems, and family meal patterns Researchers administered the questionnaires within classrooms to students in groups of 25-30	Disordered eating behaviour	"With what frequency do you eat the midday meal at the table with the family members who are at home?" "With what frequency do you eat the evening meal at the table with the family members who are at home?" FFM not defined	Bulimic Investigatory Test, Edinburgh Youth self-report Various questions to assess FMF and binge-eating episodes

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STUDY	N VALUE	DATA SOURCE AND SETTING	PARTICIPANT CHARACTERISTICS	STUDY DESIGN	OUTCOMES MEASURED	DEFINITION OF FFM	PSYCHOSOCIAL MEASURES
Neumark-Sztainer et al, ³⁸ 2008	2516	Adolescents from urban and suburban school districts in Minneapolis who participated in Project EAT-I and Project EAT-II	Ethnically and socioeconomically diverse Males (n = 1130), females (n = 1386) Mean (SD) age of middle school participants: Time 1 was 12.8 (0.8) y; Time 2 was 17.2 (0.6) y Mean (SD) age of high school participants: Time 1 was 15.8 (0.8) y; and Time 2 was 20.4 (0.8) y	Longitudinal data collected during the 1998–1999 school year (Time 1) and again in 2003–2004 (Time 2) Time 1: Project EAT-I survey administered by staff (RR 81.5%) Time 2: Project EAT-II survey distributed via mail and self-administered (RR 68.4%)	Disordered eating behaviour	"During the past 7 days, how many times did all or most of your family living in your house eat a meal together?" FFM defined as ≥5 meals wk	Specific questions developed for the Project EAT study were based on adolescent focus group findings, a review of existing instruments, expert revisions, a social-cognitive theoretical framework, and pilot tests
Neumark-Sztainer et al, ³⁹ 2007	2516*	Adolescents from urban and suburban school districts in Minneapolis who participated in Project EAT-I and Project EAT-II	Ethnically and socioeconomically diverse Males (n = 1130), females (n = 1386) Mean (SD) age of middle school participants: Time 1 was 12.8 (0.8) y; Time 2 was 17.2 (0.6) y Mean (SD) age of high school participants: Time 1 was 15.8 (0.8) y; Time 2 was 20.4 (0.8) y	Longitudinal data collected during the 1998–1999 school year (Time 1) and again in 2003–2004 (Time 2) Time 1: Project EAT-I survey administered by staff (RR 81.5%) Time 2: Project EAT-II survey distributed via mail and self-administered (RR 68.4%)	Disordered eating behaviour	"During the past 7 days, how many times did all, or most, of your family living in your house eat a meal together?" FFM defined as ≥5 meals per wk	Specific questions developed for the Project EAT study were based on adolescent focus group findings, a review of existing instruments, expert revisions, a social-cognitive theoretical framework, and pilot tests
Eisenberg et al, ⁴⁰ 2008	806	Adolescents from middle schools (grades 7–8) in Minnesota who participated in Project EAT-I and then in Project EAT-II	Ethnically and socioeconomically diverse Males (n = 366), females (n = 440) Mean (SD) age at Time 1 was 12.8 (0.8) y; at Time 2 was 17.2 (0.6) y	Longitudinal data collected during the 1998–1999 school year (Time 1) and again in 2003–2004 (Time 2) Time 1: Project EAT-I survey administered by staff Time 2: Project EAT-II survey distributed via mail and self-administered (RR 69.5%)	Substance use	"During the past 7 days, how many times did all, or most, of your family living in your house eat a meal together?" FFM defined as ≥5 meals wk	Specific questions developed for the Project EAT study were based on adolescent focus group findings, a review of existing instruments, expert revisions, a social-cognitive theoretical framework, and pilot tests

COOL—Controlling Overweight and Obesity for Life, EDI—Eating Disorders Inventory, FFM—frequent family meals, FMF—family meal frequency, GUTS—Growing Up Today Study, NGHS—National Heart, Lung, and Blood Institute Growth and Health Study, Project EAT—Project Eating Among Teens, RR—response rate, UK—United Kingdom, US—United States.

*Results based on a sample size of N = 3025 owing to participant exclusions.

†Results are based on a subset of patients who were overweight or who participated in binge eating or extreme weight-control behaviour, which consisted of 577 females and 312 males (total N = 889).

Frequency of family meals

The reported family meal frequency rates in the reviewed studies varied from 32.9%¹⁶ to 60.6%.³⁴ Reports of infrequent family meals (0 to 2 family meals per week) also varied, ranging from 11%³⁵ to 33.1%.³⁶ The varying results are likely influenced by many different factors (eg, age).²⁴ Three longitudinal studies found that the frequency of family meals decreased as the adolescent progressed toward adulthood.^{32,34,35} Similarly, other factors such as geographic location and cultural issues have also been shown to affect results. For example, frequent family meals appear to be more common in Spain than in the United States or Britain, with 78% of youth in Spain

reporting a high frequency of family meals³⁷ versus only 45% of American youth^{18,38} and 32.9% of British youth.¹⁶ The only Canadian study reports a 70% prevalence of high family meal frequency³⁵; however, it should be noted that the sample in this study is young (grades 6 to 8), which might be a contributing factor to this higher rate.

Disordered eating behaviour

Table 2^{15,16,18,19,30,32–40} presents the main findings of the following discussion. Nine of the 14 studies reviewed explored the relationship between family meal frequency and disordered eating behaviour, including extreme weight-control behaviour (defined as

Table 2. Main findings of studies reviewed: A) Studies in which results differed between sexes; B) Studies in which sex was not specified.

A)		MAIN FINDINGS	
STUDY IN WHICH RESULTS DIFFERED BETWEEN SEXES	OUTCOMES MEASURED	FEMALES	MALES
Franko et al, ¹⁵ 2008	Disordered eating behaviour, body image concern, and substance use	There was a statistically significant inverse association between FMF and bulimia symptoms, body dissatisfaction, drive for thinness, and cigarette smoking FMF was not significantly associated with extreme weight-control behaviour nor with alcohol consumption	NA
Neumark-Sztainer et al, ¹⁹ 2004	Disordered eating behaviour	There was a statistically significant inverse association between FMF and extreme and less extreme weight-control behaviour and chronic dieting FMF was not significantly associated with binge eating	There was a statistically significant inverse association between FMF and extreme and less extreme weight-control behaviour (this relationship with less extreme weight-control behaviour was only present after adjusting for BMI and sociodemographic factors) FMF was not significantly associated with binge eating nor with chronic dieting
Fisher et al, ³⁰ 2007	Substance use	There was a statistically significant inverse association between FMF and alcohol initiation (ie, girls who ate a family meal every day were 50% less likely to initiate alcohol use than those who ate a family meal some days or never)	FMF was not significantly associated with alcohol initiation
Haines et al, ³² 2010	Disordered eating behaviour	There was a statistically significant inverse association between FMF and purging, binge eating, and chronic dieting	There was a statistically significant inverse association between FMF and binge eating and FMF and chronic dieting FMF was not significantly associated with purging
Sen, ³⁴ 2010	Substance use and violent behaviour	There was a statistically significant inverse association between FMF and smoking, marijuana use, alcohol use, and physical violence	There was a statistically significant inverse association between FMF and smoking, marijuana use, alcohol use, and physical violence
Neumark-Sztainer et al, ³⁸ 2008	Disordered eating behaviour	There was a statistically significant inverse association between FMF and extreme and less extreme weight-control behaviour, binge eating, and chronic dieting	FMF was not significantly associated with extreme weight-control behaviour, binge eating, or chronic dieting FMF was statistically significantly associated with an increased likelihood of less extreme weight-control behaviour (ie, skipping meals and eating very little food)
Eisenberg et al, ³⁶ 2004	Self-esteem, academic achievement, depressive symptoms or suicidality, and substance use	There was a statistically significant inverse association between FMF and low self-esteem, a low grade point average, high depressive symptoms, suicidal thoughts, suicide attempts, cigarette use, marijuana use, and alcohol use	There was a statistically significant inverse association between FMF and a low grade point average, high depressive symptoms, suicidal thoughts, cigarette use, marijuana use, and alcohol use FMF was not significantly associated with low self-esteem

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A)		MAIN FINDINGS	
STUDY IN WHICH RESULTS DIFFERED BETWEEN SEXES	OUTCOMES MEASURED	FEMALES	MALES
Neumark-Sztainer et al, ³⁹ 2007	Disordered eating behaviour	FMF was statistically significantly associated with extreme weight-control behaviour and binge eating	FMF was not significantly associated with extreme weight-control behaviour nor with binge eating
Eisenberg et al, ⁴⁰ 2008	Substance use	There was a statistically significant inverse association between FMF and cigarette, marijuana, and alcohol use	FMF was not significantly associated with cigarette, marijuana, and alcohol use
B)		MAIN FINDINGS	
STUDY IN WHICH SEX WAS NOT SPECIFIED	OUTCOMES MEASURED	MAIN FINDINGS	
White and Halliwell, ¹⁶ 2010	Substance use	There was a statistically significant inverse association between FMF and tobacco smoking and alcohol use	
Fulkerson et al, ¹⁸ 2006	Disordered eating behaviour, depressive symptoms or suicidality, self-esteem, academic achievement, substance use, and violent behaviour	There was a statistically significant inverse association between FMF and purging, binge eating, depression or suicide risk, alcohol use, drug use, tobacco use, and violent behaviour FMF was statistically significantly positively associated with increased self-esteem and increased commitment to learning	
Woodruff and Hanning, ³⁵ 2009	Disordered eating behaviour, body image concern, and self-efficacy	No association was found between FMF and dieting There was a statistically significant inverse association between FMF and skipping meals (specifically breakfast) and with concern about high body weight FMF was statistically significantly positively associated with increased self-efficacy for healthy eating both at home with family and at social events with friends	
Fulkerson et al, ³³ 2009	Disordered eating behaviour, depressive symptoms, and substance use	There was a statistically significant inverse association between FMF and skipping a meal (specifically breakfast) and depressive symptoms FMF was not significantly associated with extreme and less extreme weight-control behaviour, nor with cigarette, marijuana, alcohol, or illicit drug use	
Sierra-Baigrie et al, ³⁷ 2008	Disordered eating behaviour	FMF was not significantly associated with binge eating	

BMI—body mass index, FMF—family meal frequency, NA—not applicable.

ingestion of diet pills, self-induced vomiting, use of laxatives, or use of diuretics to control weight),^{15,18,19,32,33,38,39} less extreme weight-control behaviour (defined as fasting, eating very little food, using food substitutes, skipping meals, or smoking cigarettes to control weight),^{19,33,35,38} binge eating,^{15,18,19,32,37-39} and chronic dieting.^{19,32,35,38}

In general, some studies report an inverse association between family meal frequency and extreme weight-control behaviour,^{15,19,32,38,39} less extreme weight-control behaviour,^{19,38} binge eating,^{15,32,38,39} and chronic dieting,^{19,32,38} with most studies maintaining statistically significant findings for females even after adjusting for factors such as family connectedness, sociodemographic characteristics, and personal and behavioural qualities.^{15,19,32,38,39}

Conversely for males, most studies reported no significant association between frequent family meals and extreme weight-control behaviour,^{19,38,39} binge

eating,^{19,38,39} or chronic dieting.^{19,38} Additionally, 1 longitudinal study indicated that frequent family meals were statistically significantly associated with a greater likelihood of less extreme weight-control behaviour, both before and after adjusting for a variety of variables.³⁸

Studies that did not specify results by sex showed inconsistent results.^{18,33,35,37}

Externalizing behaviour

Research has explored associations between family meal frequency and externalizing behaviour such as substance use and violence.

Substance use. The substances examined in these studies included tobacco (cigarette smoking), marijuana, alcohol, and illicit drugs. For females, an inverse association between family meal frequency and use of cigarettes,^{15,34,36,40} alcohol,^{30,34,36,40} and marijuana^{34,36,40} was found, even after adjusting for demographic, familial,

and parental characteristics, socioeconomic status, and earlier substance use variables.^{34,36,40}

Study results were less consistent for males. Family meal frequency was negatively associated with cigarette, marijuana, and alcohol use in some studies^{34,36} but not in others.^{30,40} **Table 2**^{15,16,18,19,30,32-40} shows results from studies that did not differentiate between sexes.^{16,18,33}

Violence. Inverse associations were found in 2 studies between family meal frequency and violence, such as frequency of fighting, hitting, injuring a person, carrying or using a weapon, and threatening physical harm.^{18,34}

Internalizing behaviour

Associations between family meal frequency and internalizing behaviour including body image, self-esteem, academic achievement, and depressive symptoms and suicidal thoughts are discussed here.

Body image concern. Family meal frequency was inversely associated with both body dissatisfaction and drive for thinness¹⁵ and concern about high body weight.³⁵ There were no studies that examined these variables in males.

Self-esteem or self-efficacy. One study found a negative association between family meal frequency and low self-esteem in females but not in males.³⁶ Another study (not sex specific) reported a positive association between frequent family meals and increased self-esteem, even after controlling for various familial factors,¹⁸ while a second study that was also not sex specific reported a positive association between frequent family meals and increased self-efficacy for healthy eating in various social environments.³⁵

Academic achievement. Frequent family meals were positively associated with a higher grade point average in both females and males in one study, and statistical significance was maintained in the female sample even after controlling for various demographic and familial factors.³⁶ Another study found a similar association between family meal frequency and commitment to learning, which also remained statistically significant after adjusting for family support and family communication.¹⁸

Depressive symptoms or thoughts of suicide. One study reported a statistically significant negative association between family meal frequency and high depressive symptoms, as well as between family meal frequency and suicidal thoughts, in both females and males.³⁶ This statistical significance was maintained even after adjusting for various demographic and familial factors. The only noted difference between the sexes was the existence of a statistically significant negative association

between family meal frequency and suicide attempts in females that was not present in males. Two other non-sex-specific studies found a statistically significant inverse association between family meal frequency and depressive symptoms,^{18,33} with one study extending this association to include suicidal risk.¹⁸ Findings also remained statistically significant after controlling for similar factors.

DISCUSSION

The findings of this systematic review indicate that eating frequent family meals is associated with better psychosocial outcomes for children and adolescents. In general, frequent family meals were inversely associated with disordered eating, alcohol and substance use, violent behaviour, and feelings of depression or thoughts of suicide. There was a positive relationship between frequent family meals and increased self-esteem and commitment to learning or a higher grade point average. However, the findings also highlight the differences in outcomes for males and females, with females seemingly gaining more protective effects from frequent family meals than males do.

What do we know about the barriers that exist to having frequent family meals? Both parents' and adolescents' busy schedules⁴¹⁻⁴⁵ are often cited as common reasons for less frequent family meals. In addition, there is a disparity of family meal frequency across socioeconomic levels. Neumark-Sztainer and colleagues found that lower socioeconomic status was associated with lower frequency of family meals,²¹ and Widome and colleagues found that food-insecure youth ate fewer family meals than food-secure youth.⁴⁶ From 1999 to 2010, there was a decline in family meal frequency among adolescents from low socioeconomic status and an increase in frequency among adolescents from high-middle socioeconomic families.⁴⁷

Despite our advances in some areas of understanding, it remains unclear exactly how family meals improve adolescent outcomes, especially for females. The relationship between family meals and psychosocial outcomes might in fact be bidirectional (ie, increased family meals lead to decreased odds of poor psychosocial outcomes but also that psychosocially healthier youth and families might simply engage in more family meals).

It is unclear why there are differences between the effects of family meals for males and females. Research has shown that males and females respond differently to family dynamics. For example, Crosnoe found that family instability magnified the socioemotional risks of obesity for girls but not for boys.¹¹ Other researchers have also found that high-risk youths' perception of their family connectedness being strong is associated with

reduced odds of being sexually experienced and having initiated sex before the age of 13 for females but not for males.¹³ In addition, females respond differently to family economic problems than males do, and females are more sensitive to family disruptions (ie, parents' negative moods) than males are.¹⁰ Griffin and colleagues found that some protective effects of parenting practices were limited to females and not males¹²; for example, frequent parent checking of homework was associated with less aggression in females but not males. If the mechanism of the positive effects of family meals is related to family connectedness and other similar family factors, it is therefore possible that males do not gain the same protective effect from frequent family meals because of their different response to family dynamics.³¹

Future studies should examine the specific mechanisms by which frequent family meals might lead to improved psychosocial outcomes in youth. Furthermore, research should continue to explore the barriers that exist to having frequent family meals, including socioeconomic implications.

Limitations

Limitations exist with all the individual studies reviewed. Regarding the results of the cross-sectional studies, we can infer associations but not causality. For example, those with concern about high body weight or those with already-established disordered eating or substance use or abuse, etc, might avoid family meals, and children and youth who are already doing well could be more likely to eat with their families. Many studies also relied on self-report survey data that have the potential of recall bias and social desirability bias. There might also be an unmeasured protective factor in families who dine together regularly that was not captured; there is the potential that other unmeasured confounders (eg, family structure) could explain the positive results. In addition, the overall generalizability of some of the samples is variable depending on the demographic variability of the samples. However, even with these limitations, together these studies produce patterns based on very large, often diverse, samples. The studies reviewed had sample sizes between 145 and 99462, including different ethnicities, and many attempted to control results for potential confounders such as family connectedness. In addition, the longitudinal nature of some of the reviewed studies adds more powerful associations.

Conclusion

This review provides further support that frequent family meals are associated with better psychosocial outcomes for children and adolescents. Although more research is needed to prove causality, there are few risks to recommending that families strive to have frequent family meals. All health care practitioners should

educate families on the potential effects of having regular meals together as a family. In addition, practitioners should explore any obstacles that might exist to having family meals and discuss potential strategies for their implementation.

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Contributors

Dr Harrison contributed to study design and acquisition of data, reviewed all articles included in the systematic review, interpreted data, and drafted the manuscript. **Dr Norris** contributed to study conception and design, and revised the manuscript. **Dr Obeid** participated in data analysis and interpretation, and contributed to drafting and revising the manuscript. **Ms Fu** contributed to data analysis, as well as drafting and revising the manuscript. **Dr Weinstangl** participated in data acquisition, reviewed articles included in the systematic review, contributed to data analysis, and helped with manuscript drafting. **Dr Sampson** participated in the study design and data acquisition, as well as drafting and revising the manuscript. All authors read and approved the final manuscript.

Competing interests

None declared.

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