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Original Paper

Review of the Literature on Parental Efficacy and Child Nutrition, Activity, and Weight

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Abstract

Objective: *Concern over childhood obesity has driven research to focus on prevention and intervention strategies to curb the epidemic. Parental factors like efficacy have gained attention as this concept is grounded in behavioral change research. Studies have linked efficacy to improved child health behaviors like eating a more nutritious diet and engaging increased physical activity. This leads to a need to examine parental efficacy literature to examine its relationship to childhood obesity.*

Methods: *Six databases including the Psychology and Behavioral Sciences Collection, CINAHL, PubMed, Psychinfo, EBSCOhost, and Onesearch were searched for original research studies examining parental efficacy and child health measures like diet, activity, or weight.*

Results: *Only 16 articles were found that met criteria. This limited research did showcase that higher parental efficacy levels are linked to positive effects, especially regarding improved child diet. There is also evidence of an inverse relationship between higher efficacy and lower child weights and higher efficacy and improved child activity levels, though this was not uniformly found. This review also showcased significant variance in how efficacy is measured and how it is used within studies.*

Conclusion: *Connections between parental efficacy and child healthy behaviors has been established in multiple studies. However, this remains an under-examined area that needs further study to understand how it can be used to improve interventions.*

Keywords

Childhood obesity, overweight, parenting, efficacy, prevention, child health, BMI, preschool

1. Introduction

The increasing levels of childhood obesity and the lifelong associated health and social consequences have inspired a focus on intervention and prevention strategies for preschool-aged children (McKee, Long, Southward, Walker, & McCown, 2016). Parental influence is crucial in this young population and is known to affect initiating healthy lifestyles, regulating diet, and promoting physical activity (Cullinan & Cawley, 2017; Howe, Alexander, & Stevenson, 2017; Grossklaus & Marvicsin, 2014; Leary, Ice, Neal, & Cottrell, 2013; Rhee, 2008; Scaglioni, Salvioni, & Galimberti, 2008). Because of the parental role in regulating and modeling healthy behaviors that influence child weight, parents must feel capable to effect change and influence the child (Montigny & Lacharite, 2005).

This idea of being capable of effecting change has been linked to the concept of efficacy, which developed from Albert Bandura's social cognitive theory in the 1970s (Affendi et al., 2018; Montigny & Lacharite, 2005). Successful intervention strategies for obesity treatment have relied on the social cognitive theory, which has efficacy as a central tenet (Bohman, Rasmussen, & Ghaderi, 2016).

The efficacy concept has evolved through social science and health research, though its examination has been limited and confused with other concepts like parental competence, parental self-esteem, and parental self-confidence (Montigny & Lacharite, 2005). Two literature reviews examining efficacy research through 2008 identified a general lack of studies examining the effect of parental efficacy on obesity (Grossklaus & Marvicsin, 2014; Montigny & Lacharite, 2005). The limited research was identified as a gap that needed further exploration as understanding the relationship between childhood obesity and efficacy could provide meaningful information that healthcare professionals like nurses could use to identify and improve parental confidence in addressing health and weight issues in children (Grossklaus & Marvicsin, 2014; Montigny & Lacharite, 2005).

Limited analysis of the parental efficacy concept was highlighted as a gap in both studies, especially as what research has been done has hinted to a positive (though limited) link between efficacy and well-being for individuals and families (Grossklaus & Marvicsin, 2014; Montigny & Lacharite, 2005). While the 2014 review found six articles specifically discussing efficacy (Grossklaus & Marvicsin, 2014), the 2004 review identified 30 articles each in nursing and psychology that examined parental efficacy from 1980 onward (Montigny & Lacharite, 2005). However, only 27 of the 60 were noted to have measured efficacy as outlined by Bandura, and those articles mainly focused on mediators of efficacy and not on how efficacy affects health issues like obesity (Montigny & Lacharite, 2005).

Successful strategies may depend on how much efficacy the parent has in their abilities to influence and help their children. Efficacy has been described as an influential force that enhances or impedes motivation for behavior change, and that is related to one's confidence to successfully perform required tasks (Affendi et al., 2018). It also relates to an ability to transfer knowledge successfully into action (Campbell, Hesketh, Silverii, & Abbott, 2010). Using Bandura's model, perceived parental efficacy is the "beliefs or judgments a parent holds of their capabilities to organize and execute a set of tasks related to parenting a child" (Montigny & Lacharite, 2005, p. 394). Parental efficacy, therefore, relates to how

effective a parent believes they are, which contributes to their ability to have positive influence in early childhood development and in future child outcomes (Yu, 2011).

This review sought to understand how parental efficacy has been conceptualized relating to obesity, what scales have been used to measure it, and if it is linked to improvements in child weight or health outcomes.

2. Methods

Original research articles examining parental efficacy and comparing it to either weight or improvement in lifestyle factors were included in this review. Six databases including Psychology and Behavioral Sciences Collection, CINAHL, PubMed, Psychinfo, EBSCOhost, and Onesearch were examined. Onesearch is a database that allows comprehensive searching of the entire library catalog and provides results ranked in terms of relevance. As two earlier reviews were found on this topic, this search focused only on articles published after 2008 (Grossklaus & Marvicsin, 2014).

2.1 Search Strategy

The search was conducted between March 2018 and May 2018. Search terms included variations of these word combinations: “parent” and “efficacy” versus “parental efficacy” and “parental efficacy” or “efficacy”, “child weight” versus “child BMI” and “child health”. Another search string included “efficacy”, “parenting”, and “childhood obesity”. Titles and abstracts were searched to first assess if the study met inclusion and exclusion criteria. The study selection process is detailed in Figure 1.

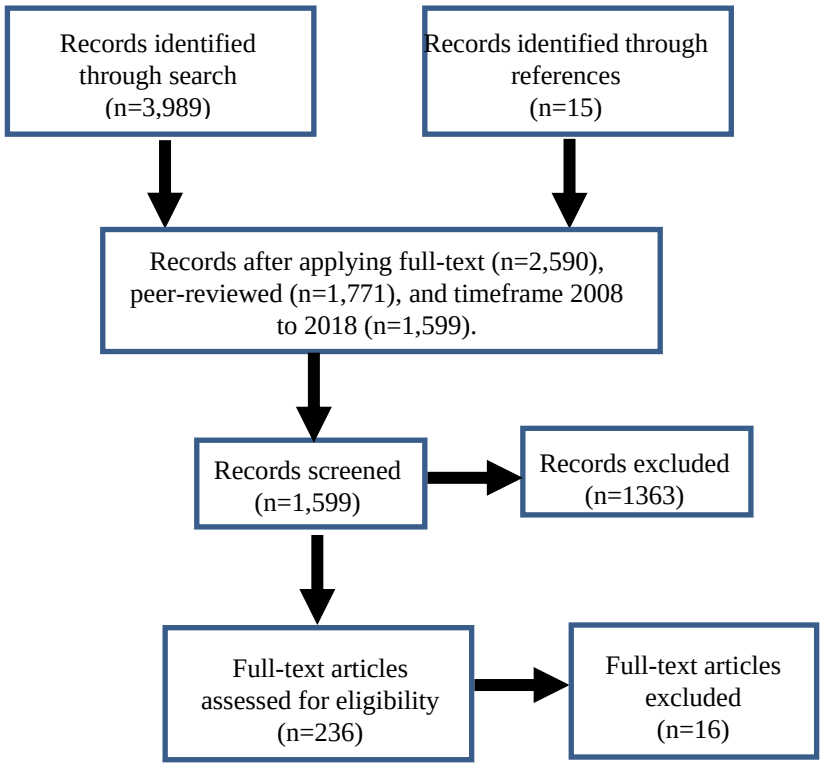

Figure 1. Process of Paper Selection

2.2 Inclusion Criteria

For inclusion, parental efficacy had to be an outcome measure linked to either healthy lifestyles, such as activity or nutrition improvement, or to weight in children. Only studies completed from 2008 to 2018 were included to focus on new research. This criterion was established partly due a previous literature review that found efficacy had been addressed in six studies, though they had all been done prior to 2008 (Grossklaus & Marvicsin, 2014).

2.3 Exclusion Criteria

Exclusion criteria included: any study not available in English or full text, studies not published in peer-reviewed journals, review articles or studies validating scales (unless this included comparison to weight or health parameters), and duplicate articles were excluded. During the full-text analysis, the majority of studies were excluded because they involved scale development, were not original research, or did not provide enough information on efficacy results.

3. Results

This current analysis encompasses 16 new studies conducted from 2008 onward. Of the studies in this current review, the majority were conducted in the United States and Australia with four each. Other studies were conducted in Sweden, the Netherlands, Turkey, Iran, and England. Most studies (n=12) used a cross-sectional design while only 1 did a longitudinal study and three did randomized control trials.

In all but one study (Nyberg et al., 2016), there was an official measurement of efficacy that was scored and used for comparison. The study with no official scale incorporated efficacy in the intervention and compared an experimental group to a control, which is why it was still included in the review.

Table 1 shows how efficacy has been measured in a chronological timeline since 2008. The 16 articles that ultimately met inclusion criteria are listed and the concepts included in evaluating efficacy are described.

Table 1. Chronological Conceptualization of Self-efficacy

Study	General Measure	Focused Measure
Campbell et al. (2010)	General parenting	
Gerads et al. (2013)		Lifestyle behaviors related to problems and confidence
Loprinzi et al. (2013)		Confidence in providing support for physical activity
Marvicicin and Danford (2013)		Control and discipline
Willis et al. (2014)	General confidence	
Xu, Wen and Rissel (2014)	Global parenting	
Enebrink et al. (2015)		Self-competence, knowledge, and experience

Ekim (2016)		Dietary and physical activity
Gibson et al. (2016)		Self-worth and acceptance
Ice et al. (2014)		Nutrition, physical activity, and parental role to influence healthy behavior
Nyberg et al. (2016)		Healthy eating and physical activity; parental willingness to change; parental care and control
Salarkia et al. (2016)	General parenting	
Berry et al. (2017)		Emotional eating
Heerman et al. (2017)	General parenting	
Williams et al. (2017)	General parenting	Confidence in creating healthy home environment
Parekh et al. (2018)		Healthy behavior, limit-setting, and physical activity

3.1 How is Efficacy Conceptualized?

While many examinations of efficacy are linked to the social cognitive theories of Bandura and describe parental capability to be confident in acting successfully, the tool used to measure efficacy varied considerably in this review. In fact, no one scale has been used consistently to evaluate parental efficacy and its effect on child health behaviors or weight.

Prior to 2008, the Parenting Sense of Competence Scale (PSOC) that focuses on evaluating satisfaction, efficacy, and parental competence on a Likert-scale was used (Grossklaus & Marvicsin, 2014). However, only one of the 16 studies in this review used that scale. Instead, four studies used a general parenting tool, one used both a general and a focused efficacy measure, and 11 used various focused measures dealing with a range of items including self-worth, diet and physical activity, and even limit-setting ability. How each study evaluated efficacy is shown in Table 1 using a chronological ordering.

Of note is the evolution of efficacy measurement. Campbell et al. (2010) was one of the first to work on how parental efficacy can specifically affect dietary and sedentary behaviors, which has been deemed important to the obesity. As earlier work had involved a more general focused tool, Campbell et al. (2010) utilized a self-created and focused measure that evaluated maternal confidence to influence and control their child's eating and sedentary behaviors on a five-point Likert scale. The scale specifically rated promoting healthy eating, limiting non-core foods, and promoting physical activity.

Starting in 2013, other researchers began work developing specific efficacy scales that were designed to target efficacy for behaviors that can help or hinder obesity in children. These scales include the Parental Efficacy Questionnaire (Decker, 2012) and Parental Efficacy for Healthy Dietary and Physical Activity Behavior in Preschoolers Scale (Bohman, Rasmussen, & Ghaderi, 2016; Decker, 2012). While the former has two subscales gauging confidence of parents to have children ages 6 to 12 do specific items like eat vegetables, choose healthy foods at school, and play outdoors the latter examines parent's efficacy to promote healthy dietary behaviors, perform limit setting of unhealthy diet and activity, and

encourage healthy physical activity. Each of these scales were used in at least one of the 16 studies.

Other studies did not include multi-item scales to evaluate efficacy. One study (Loprinzi et al., 2013) asked a single question about parental confidence to support activity while another (Xu, Wen, & Rissel, 2014) asked a single question about global parenting and four questions relating to infant parental efficacy. One study also took an efficacy scale meant to measure something else and substituted specific obesity items relating to nutrition and activity into the scale (Ice, Neal, & Cottrell, 2014).

The specific scales used in each of the 16 studies are shown in Table 2. This review highlights that parental efficacy has been measured using both general and focused scales and even by just a single or a small number of questions.

Table 2. Studies and Effect Sizes of Parental Self-efficacy and Child Weight and Health Measures

Study, country	**Sample (number, gender, mean age)**	**Design Self-efficacy measure**	**Results**
Berry et al. (2017), United States	Parents (N=184; Female 92%, Age36.9±8.1) Child (N-184, Female 54.9%, 9.2±0.96)	RCT Parent: Eating Self-Efficacy Scale to measure emotional eating Bandura's Exercise Self-Efficacy Scale Child: CATCH questionnaire for eating and exercise self-efficacy	*Post phase I (3 months)* Parent/child eating self-efficacy R=-0.067 Parent/child exercise self-efficacy R=0.121 Parent/child nutrition knowledge and behaviors R=0.203* *Post phase II (12 months)* Parent/child eating self-efficacy R=-1.131 Parent/child exercise self-efficacy R=0.162 Parent/child nutrition knowledge and behaviors R=0.002 *Completion (18 months)* Parent/child eating self-efficacy R=-0.111 Parent/child exercise self-efficacy R=-0.098 Parent/child nutrition knowledge and behavior change R=0.024 Parent and Child Triceps Skinfolds (millimeter) *Post phase I (3 months)* R=0.429* *Post phase II (12 months)* R=0.533* *Completion (18 months)* R=0.332* Parent and Child Subscapular Skinfolds (millimeter) *Post phase I (3 months)*

			R=0.151* *Post phase II (12 months)* R=0.368* *Completion (18 months)* R=0.292* Parent and Child Waist Circumference (centimeter) *Post phase I (3 months)* R=0.328* *Post phase II (12 months)* R=0.259* *Completion (18 months)* R=0.409*
Campbell et al. (2010), Australia	Mothers of 1-year-olds (N=60, female, 29.8 ± 5.4) and of 5-year-olds (N=80, female, 36.1±5.1) Child in 1-year-old group (N=60, 15±3.9 months, 48.3% female) and in 5-year-old group (N=80, 59±3.9 months, 50% female)	CS Self-designed assessment	Average maternal self-efficacy (out of 5): *Promoting healthy eating* 1-year-olds 4.51 5-year-olds 4.38 *Limiting non-core foods**** 1-year-olds 4.30 5-year-olds 3.84 *Promoting physical activity* 1-year-olds 4.43 5-year-olds 4.25 *Limiting TV viewing**** 1-year-olds 3.69 5-year-olds 2.85
Ekim (2016), Turkey	Mothers (N=425, female, 32.5±4.6) Child (N=425, 53.8% female, 4.5±0.88)	CS Parental Self-Efficacy Questionnaire rating dietary behaviors and physical activity domains	Average total of parent dietary score 176.7 of 270 Average total of physical activity scores 44 of 60 Total score average 221.7 of 330 Child's BMI and physical activity domain R=0.51* Mother's BMI and physical activity domain -0.66* Child's BMI and dietary domain R=0.59* Mother's BMI and physical activity domain -0.66*

			Mother's education, BMI, and income and dietary domain R=0.71*, R= -0.69*, R=0.61*
Enebrink et al. (2015)	Parent (N=104, 92.3% female) Child (N=104, 55.8% female, 2-6 63.5% and 7-12 36.5%)	CS Tool to measure parenting self-efficacy (TOPSE) scaled modified to Parental Self-efficacy Scale (PSE)	PSE *Baseline mean:* 51.22 (7.83) for no follow-up group 47.85 (7.65) for 4-month follow up *PSE pre and post measure scores by subscale (SD)* Being with your child 52 (8.26); 52.89 (8.22) Empathy and understanding 50.85 (6.84); 53.34 (5.53)** Guidance 40.21 (9.03); 42.32 (8.45)** Rules/discipline 42.80 (9.97); 46.24 (8.74)** Self-competence 49.16 (7.86); 51.30 (7.13)** Knowledge and experience 50.27 (7.06); 52.15 (6.51)** *Child physical and psychological well-being pre and post (SD)* Physical health 19.51 (3.14); 20.23 (2.75)** Psychological health 24.76 (3.09); 24.77 (2.76) Emotional well-being 27.91 (4.52); 28.61 (4.35)** Independence 18.69 (3.14); 19.65 (2.88)** Family relations 24.24 (3.28); 24.72 (3.17)*
Gerads et al. (2013), Netherlands	Parent (N=273, 76.6% mother, 40.35±7.01 mother's age, 42.84±7.33 father's age) Child (N=273, 48.7%, 7.88 ± 2.73)	CS Lifestyle Behavior Checklist (LBC) Child Rearing Practices Report (CRPR)	LBC: *Problem scale* 39.12 ± 14 *Confidence scale* 208.14 ± 32.85 CRPR: *Nurturance* 4.51 ± 0.33 *Restrictiveness* 2.48 ± 0.47 *Psychological control* 1.79 ± 0.53 BMI z-score of child small effect size for correlation with LBC problem scale (r=0.21)**
Gibson et al. (2016), Australia	Children (N=271, 53% female, 9.43±1.8)	L Analysis of longitudinal data from	Rosenberg result by community healthy weight 17.91 ± 4.17

	Mothers (N=199)	childhood growth and development study (GAD) Rosenberg Self-Esteem Scale evaluating self-worth or acceptance	Rosenberg result by community overweight/obese 18.04 ±4.54 Rosenberg result by clinical overweight/obese 18.82 ±5.38 Baseline child weight: 63% (n=171) healthy weight, 27% (n=72) overweight, 10% (n=28) obese. No effect of Rosenberg on weight change over the two year period. Other measures proved to have a significant effect.
Heerman et al. (2017), United States	Parent (N=601, 97.8%, 31.45) Child (N=601, 51.4%, 4.32)	CS Parenting Sense of Competence Scale (PSOC-5)	Mean PSOC-5 score 25 (IQR 24, 28; Range 16-30) Association of PSOC-5 to child sleep *Step 1* 0.23** *Step 2* 0.22** *Step 3* 0.22** Association of PSOC-5 to meal-time exposure (meals in front of the tv) -0.15** *Step 2* -0.14** *Step 3* -0.14** Parenting self-efficacy (median PSOC-5 25; IQR 24–28) was negatively correlated with depressive symptoms ($\rho=-0.16$; $p<0.001$). In adjusted models, higher parenting self-efficacy was associated with duration of child's sleep and fewer meals eaten in front of a TV ($p<0.001$). The goal was to link parenting self-efficacy and childhood behaviors that support healthy childhood growth
Ice et al. (2014); United States	Parents (N=820; 92% female) Child (N=820, 50.5% female)	CS Questions based on the Hoover-Dempsey and Sandler scale: Parent Efficacy for Helping the Child Succeed in School (nutrition and physical activity were used instead of achievement-related questions) 10 questions created to ask about parental role in child's healthful	Efficacy related to child BMI percentile** Parents of obese children had significantly lower efficacy than parents of overweight/normal children** As children advanced in ages, parental efficacy and parental role construction decreased* Parental efficacy and parental role for assisting in child healthful behaviors significantly correlated with child fruit and vegetable intake*

		behaviors	
Loprinzi et al. (2013)	Parent (N=176, 84.6% female, 35.6) Child (N=176, 53.2% female, 4)	CS 5-item questionnaire by Adkins et al.	Parental self-efficacy Mean (SD) 4.6 (0.7) Positive association with parental support, parental warmth, parental physical activity, and parental monitoring of physical activity* Parental BMI was positively associated with parental warmth and restrictive play rules*
Marvicisin and Danford (2013), United States	Parent (N=27, 74% female, 42.8) Child (N=27, 51% female, 10.41)	CS Tool to Measure Parenting Self-Efficacy (TOPSE) – only control and discipline domains Modified version for children.	Parent and child perceptions of efficacy Control *Low efficacy* 0%, 0% *Average efficacy* 52%, 74% *High efficacy* 48%, 26% Discipline *Low efficacy* 0%, 0% *Average efficacy* 41%, 37% *High efficacy* 59%, 63% Paired sample *t*-test was used to test the difference between parent and child perception of *control*, revealing a significant difference in perception, $t = 3.12$, $df = 26$, $p < 0.05$. More children rated their parent as having average control. The only significant correlation was between the child's report of the participating parent's control and child BMI $r(27) = -0.49$, $p = 0.01$. No significant correlations were found between parent self-report of *control* or *discipline* and child BMI.
Nyberg et al. (2016)	Children (n=375, 50.5% female, 6.3)	RCT Motivational interviewing to target either diet or physical activity behavior in children	No self-efficacy scale was used to rate parental efficacy, though this was targeted in the intervention. Outcome measures were related to diet and activity. Dietary intake effects of intervention group Unhealthy food (*b*=-0.32) ** Boys unhealthy drink (*b=-0.51)* ** Children in the intervention group versus the control group had significantly lower BMI at the end of treatment* Children in the intervention group were sedentary 9.2 minutes less during the entire week* and 11.3 min less during the weekend*
Parekh et al. (2018), Sweden	Parents (N=301, mothers, 36 ± 4 and N=299, fathers, 38±5) Children (N=164, boys, 4.18 ± 0.15; N=137,	CS Promoting Healthy Physical Activity and Dietary Behaviors in Children Scale (PSEPAD) evaluating promoting healthy	PSE scores 114 ± 14 (range 62 to 140, with a maximum potential of 140) *Healthy dietary behavior group* 51 ± 6 (range 23 to 60) *Limit setting of unhealthy dietary or physical activity behaviors* 39 ± 6, maximum score of 50 *Promotion of Healthy physical activity*

	girls, 4.48 ± 0.15)	behavior, limit setting of unhealthy behavior, and promoting physical activity	23 ± 4, maximum score of 30 *Associations between PSE and child diet* PSE score significantly and positively associated with fruit consumption in unadjusted (β = .98; r = 0.18)** and adjusted models (β = 0.82; partial r = 0.15)** *Limit setting of unhealthy dietary or physical activity behaviors* (unadjusted: β = 1.62; r = 0.13); adjusted: β = 1.32; partial r = 0.11) *Healthy dietary behaviors* in unadjusted (β = 2.37; r = 0.19)** and adjusted models s (β = 1.99; partial r = 0.16)** *Healthy dietary behavior* and *Limit setting of unhealthy dietary or physical activity behaviors* factors (β = −0.67 to −0.89; r = -0.11 to -0.14)* Unhealthy snacks and the *promoting physical activity* factor (β = -1.06; r = -0.11)* for the unadjusted model and (β = -0.97; partial r = -0.10) after adjustment for covariates *Associations between parental self-efficacy and children's physical activity, body composition, and cardiorespiratory fitness* No associations found between PSE and PA, body composition, or cardiorespiratory fitness
Willis et al. (2014), England	Parent (N=60, 96.7% female, 30.37 ± 5.3) Child N/A	CS Health Exercise Nutrition for the Really Young (HENRY) following chart of families across the 8-week course 5-item Parenting Self-Agency Measure looking at confidence to act in the successful parent role	Self-efficacy scores *Baseline* 12.55 ±4.26 *Post-course* 14.96 ±2.7** *Follow-up* 15.34 ±2.72** Self-reported parent BMI showed no change in BMI or weight. Happiness about weight increased relative to baseline.*
Williams et al. (2017), Australia	Parent (N=365, 92% mothers) Children (N=411, 55% girls, 9 ± 2 yeas)	RCT 7 items representing two constructs *parental confidence to create a healthy home environment* and *general parenting self-efficacy*	*Confidence in creating a healthy home environment* 3.0 ±0.9 (5 max) *General Parenting* 3.5 ±0.8 (5 max) No weight or lifestyle outcomes
Salarkia et al. (2016), Iran	Parent (N=423, female, 28.1 ± 5.2)	CS Maternal self-efficacy scale	Mother self-efficacy score by food security status: *Food secure* (N=202) 32.5 ±3.7 *Mild food insecurity* (N=167) 31.9 ±3.1 *Moderate and severe food insecurity* (N=54)

			28.4 ±4.0 *Total self-efficacy* (N=423) 31.9 ±3.7 BMI 25.7 ± 4.8 kg/m2 Negative correlation between household food insecurity and mother's self-efficacy (r= -0.298) ** Significant correlation between mother's self-efficacy and maternal infant feeding styles, including control of home food access (r=0.110) **, pressure to eat (r = -0.106) **, restriction for weight control (r=0.122) **, restriction for health (r=0.104)*, encouragement (r=0.167) **, and modeling behavior (r=0.114) **. Negative correlation between household food insecurity and control of food access at home (r = -0.193)** and modeling (r = -0.100)* Positive correlation between household food insecurity and the style of pressure to eat (r = 0.101) *
Xu, Wen and Rissel (2014), Australia	Mothers (n=497; age 16-24 37%, 25-29 36%, and ≥30 27%)	CS Questions from "Growing up in Australia: The Longitudinal Study of Australia Children"	*Global parenting self-efficacy* Low 26% High 74% *Parental self-efficacy for infant* Low 27% High 73% *Global parenting self-efficacy* and relationship to child outdoor playtime of ≥2 hours/day (OR=1.54)* *Parental self-efficacy for infant* and relationship to child outdoor playtime of ≥2 hours/day (OR=1.48) *Global parenting self-efficacy* and relationship to screen time of <1 hour/day (OR=0.97) *Parental self-efficacy for infant* and relationship to screen time of <1 hour/day (OR=1.48)

Note. *p-values significant at 0.05 level, ** p-values significant at 0.01 level;

CS= cross-sectional study; RCT= randomized control study; L= longitudinal study.

3.2 How is Efficacy Linked to Diet and Exercise?

The link between healthful behaviors, such as adequate fruit and vegetable intake and physical activity in children, and parental efficacy has been established by multiple studies (Campbell et al., 2010; Ice, Neal, & Cottrell, 2014; Loprinzi et al., 2013; Parekh et al., 2018; Wright et al., 2014; Xu, Wen, & Rissel, 2015; Xu, Wen, & Rissel, 2014). For example, Ice at al. (2014) found that parental efficacy was significantly correlated to child fruit and vegetable intake and physical activity (Ice, Neal, & Cottrell, 2014). That study also identified that both efficacy and parental role were significant predictors of a child's physical activity.

These results were most recently confirmed by Parekh et al. (2018) that used baseline data from the MINISTOP trial in healthy Swedish children (Parekh et al., 2018). The results showed higher efficacy

scores had a significant, positive correlation to increased fruit intake and a significant negative correlation to unhealthy snack consumption. Similarly, Campbell et al. (2010) linked maternal efficacy to the ability to promote healthy eating (Campbell et al., 2010). Their population found higher efficacy was linked to 1-year-old children's vegetable consumption and to 5-year-old children's water, fruit, and vegetable consumption.

While the above results showcase a link between parental efficacy and improved child diet, the effect on physical activity is not as clear. Three studies (Loprinzi et al., 2013; Xu, Wen, & Rissel, 2015; Nyberg et al., 2016) found significant connection between some component of activity and parental efficacy while one (Parekh et al., 2018) did not.

The motivational intervention relating to efficacy found no significant effects for physical activity between the control and intervention groups (Nyberg et al., 2016). However, there was an effect on the time spent being sedentary in the intervention versus the control group with 9.2 minute less and 11.3 minute less respectively (Nyberg et al., 2016). Another study found a significant relationship between children playing outdoors more than two hours a day and increased parental efficacy (Xu, Wen, & Rissel, 2014). In fact, this study showed children of parents with higher efficacy were 1.54 times more likely play outdoors for more than two hours a day.

Loprinzi et al. (2013) examined efficacy in a slightly different context and found significant results. This study wanted to understand how parents influenced activity behaviors in preschool children. Their results showed parents who found activity to be important were more confident in supporting physical activity, had good activity experiences as a child, and perceived child's ability for activity more highly. They also showed this linked to employing more activity-facilitating parenting practices and behaviors.

However, not all studies found a connection between parental efficacy and activity (Parekh et al., 2018).

3.3 How is Efficacy Linked to Weight?

There is a lack of studies that address child body composition or BMI and its relationship to parental efficacy. The results of these few studies have mixed results. While two studies identified that lower efficacy scores were negatively correlated to higher body mass index in children (Ice, Neal, & Cottrell, 2014; Ekim, 2016), another found no association between weight measures and parental efficacy (Parekh et al., 2018).

Both Ekim (2016) and Ice et al. (2014) used researcher-assessed weights and heights while Parekh et al. (2018) measured body composition by an air-displacement plethysmography. Using a different means to evaluate weight and body composition is a potential reason for the variance of results. Further, the effect sizes observed were small in Parekh et al. (2018) and may not be large enough to capture differences between parental efficacy and child BMI. These studies all also used different measures to evaluate efficacy, which is another factor that can contribute to varied results.

Other studies evaluating efficacy used generic scales and/or had a broader focus for the study that did not involve direct comparison of efficacy and child measures.

For example, Gibson et al. (2016) used the Rosenberg Self-Esteem Scale that has parents rate their agreement with 10 statements regarding self-worth and acceptance. The results did not predict child BMI, and the Rosenberg scores were very close between the three evaluated weight groups. Parents of children in the community healthy weight group scored 17.91 while the parents of the community overweight/obese group scored 18.04 and the clinical overweight/obese group scored 18.82. The only significant predictors found for child BMI were maternal BMI and single-parent status, which were both significant findings.

Differences between Gibson et al. (2016) and previous three studies discussed related to weight involves the scale used, which follows general efficacy measures and is not specific to parenting or promoting healthy lifestyles. Their primary purpose was also to compare longitudinal data involving 286 participants over a 2-year period to determine what family factors affect development of weight issues in children aged 6 to 13 with a mean age of 9.43. This age is older than the other studies, and Ice et al. (2014) previously noted that parental efficacy decreases as children age. Gibson et al. (2016) also only compared efficacy to child weight (by BMI) and no other measures.

The last study that examined weight incorporated efficacy into an intervention, but did not have a standardized measure to evaluate levels (Nyberg et al., 2016). Using an efficacy-oriented intervention, they found positive changes to eating, activity, and weight. Specifically, they found children categorized as obese in the intervention group had significantly lower BMI than obese children in the control group after intervention.

In all, only 6 of the 16 studies measured parental efficacy and weight/BMI in some way as shown in Table 3. Demographic information, including weight, and associations to efficacy are outlines in this table.

Table 3. Relationship of Self-efficacy to Child Measures in Studies Including BMI as Measure by Date

Study	Sample	Child ages, mean (SD)	Child weight, % by BMI category or BMI mean (SD)	Significant correlation with efficacy
Gerads et al. (2013)	273	3-13 (7.88)	16.31 (2.24) Healthy 88.6 Overweight 5.9 Obesity 5.5	No difference between healthy and overweight children on confidence Healthy weight group lower on Problem scale**
Ice et al. (2014)	820	K, 2, 5, 8 (grades)	5-85 (68.3) 85-95 (14.7) >95 (15.3)	Child BMI percentile* (negative) Lower efficacy associated to obese categories*
Ekim (2016)	425	3-6 (4.5)	15.9 (2.64) 5-85 (77.6%)	Child BMI (r=64)** Mother education (r=0.59)**

			85-95 (13.6%) >95 (5.7%)	Mother BMI (r=-0.55)** Mother income (r=0.73)**
Gibson et al. (2016)	286	6-13 (9.43)	26.43 (5.86) Healthy (63) Overweight (27) Obese (10)	No effect with child BMI
Nyberg et al. (2016)	378	6.3	Normal (67.5) Overweight and obese (26.5)	Children in obese group had significantly lower BMI than control group after intervention* Decrease in unhealthy food consumption in boys*
Parekh et al. (2018)	301	4 (4.5)	15.8 (1.4)	No significant findings with BMI, physical activity, body composition, or cardiorespiratory fitness Fruit consumption* Negative correlation with unhealthy snacks*

**p<0.01; *P<0.05; Results are for positive correlation unless noted

3.4 Parental Efficacy's Connection to Other Findings

Six studies examined the effect of efficacy in other ways, including one that was previously discussed (Xu, Wen, & Rissel, 2015). Two of these studies (Xu, Wen, & Rissel, 2014; Campbell et al., 2010) found a relationship between efficacy and television viewing in children. Increased global parental efficacy was related to children watching less than 1 hour of television daily in children (Xu, Wen, & Rissel, 2014) while higher parental efficacy for promoting physical activity was found to lower television viewing time in 1- and 5-year-old children (Campbell et al., 2010).

Other uses of parental efficacy were to examine how it mediated participation in a health program (Williams et al., 2017), though no relationship was found, and to determine a relationship with food security issues (Berry et al., 2017). Salarkia et al. (2016) showed that household food insecurity is associated with reduced mother's efficacy, reduced control of home and food access, an increase of the use of the pressure style for child feeding (Berry et al., 2017).

Two other studies tracked changes in efficacy within a health-related intervention. While one focused on how parent and child changes in efficacy changed throughout a study period and found no significant changes (Berry et al., 2017), another tracked how parents of children 2 to 12 evolved over the intervention period (Enebrink et al., 2015). The latter found the eight measured components of efficacy all had small to moderate effect size changes and connected this to significant improvements in child emotional health and well-being that maintained to the four-month follow up.

4. Discussion

Critical analysis and synthesis of these individual studies updates the literature and identifies associations of parental efficacy on children's diet, physical activity, screen time habits, and weight. This review confirms that parental efficacy has been linked to the ability to limit television viewing and limit non-core foods/unhealthy foods/snacks (Campbell et al., 2010; Parekh et al., 2018), and fruit and vegetable intake (Campbell et al., 2010; Ice et al., 2014; Parekh et al., 2018). This indicates there is a well-established connection between higher levels of parental efficacy and healthier diets in children. However, other areas such as parental efficacy and its relationship to child weight and physical activity has varied and limited results. This limitation is also observed with how research has related to specific age groups.

A significant finding of this review is the strength of associations in preschool-age children specifically. One study examining children in four different grades from kindergarten to eighth grade confirmed that as children aged, parental efficacy decreased significantly (Ice et al., 2014). This result was illustrated again in a study looking at 1-year-old children versus 5-year-old children with the finding that all parental efficacy levels dropped between these two ages and the ability to limit non-core foods and limit television viewing had significant changes (Campbell et al., 2010). Of the studies looking at children under six, the three that used a 5-point Likert scale had parental efficacy scores hovering around 4.3 to 4.6 mostly (Campbell et al., 2010; Ice et al., 2014; Loprinzi et al., 2013) while the only one using a 5-point scale examining children around age 9 had scores of 3 and 3.5 (Williams et al., 2017).

The idea that intervention may be best focused in preschoolers is discussed in other literature as well. This time-period has been associated with establishment of basic habits that establish patterns for physical activity and nutrition that continue into adulthood (McKee et al., 2016; Hodges, Smith, Tidwell, & Berry, 2013; Baidal et al., 2015). In the preschool age, children also are more reliant on parents (Baidal et al., 2015; Lundahl, Kidwell, & Nelson, 2014).

Despite this confirmation of the importance of young children, the difficulty of this review is also highlighted by these findings as well. As so many different scales are used with varying focus and measurements, it is difficult to compare findings among studies. The variation in results could be due to the instrument used and not actual difference in efficacy. This problem is exacerbated by the limited research on this topic.

Further, the way parental-efficacy is used within studies is also highly variant. Efficacy has been used as an independent measure and its change tracked (Enebrink et al., 2015; Willis et al., 2014), to determine associations between efficacy and a child measurement (Campbell et al., 2010; Xu, Wen, & Rissel, 2014; Ice et al., 2014; Parekh et al., 2018; Ekim, 2016; Gibson et al., 2016; Berry et al., 2017; Gerads et al., 2013; Marvicsin & Danford, 2013; Heerman, Lounds Taylor, Wallston, & Barkin, 2017), as part of an intervention (Nyberg et al., 2016; Willis et al., 2014), and in analysis as a mediating factor (Salarkia et al., 2016; Williams et al., 2017). The child measurement features have been vast including television, diet, exercise, weight, and emotional well-being. Within those uses, there is difference in what efficacy has

been compared to.

The topic of how parental efficacy can influence child behaviors, diet, and weight appears to be underexplored and inconsistently explored. This lack of findings related to parental efficacy and its impact on eating and activity in children has been noted in the articles reviewed. Ekim (2016) noted the need for further theoretical and systematic knowledge that could be used to guide practices (Ekim, 2016). This is especially important considering that what research is available describes the positive effects of high parental efficacy on child nutrition, activity, and weight.

If efficacy is a measure that can affect child weight and habit formation, results from this review indicate it is important to focus on the preschool age and use a tool that targets efficacy to effect obesity-related behaviors like diet and exercise. Among these studies, key findings confirm interventions were best suited to early life as higher maternal efficacy is associated with increased obesity protective eating and sedentary behaviors at both 1 and 5 years old (Campbell et al., 2010).

To effect childhood obesity, the child cannot be considered in isolation. A child's ability to eat healthfully, engage in physical activity, develop positive habits, and engage in interventions is tied to their parents and guardians (Ekim, 2016; Hodges et al., 2013; Scaglioni et al., 2008). While the measurement tools have differed, parental efficacy has been described as a measure of how well parents feel they can influence healthy behaviors in their children. This concept of how efficacy can affect current child health and success of intervention and prevention studies needs further exploration.

However, with the results of these most current studies, there appears to be a connection between parental efficacy and promoting healthy behaviors and decreasing weight. With this in mind, nursing and other health disciplines need to use targeted strategies that increase parental efficacy in effecting change in their children.

5. Limitations

The low number of articles addressing efficacy is a limitation, though the number reflects the state of the science. Work exploring parental efficacy and its relation to promoting healthy child behaviors, including appropriate nutrition and physical activity, is limited. The science looking at how efficacy and child weight are related has even fewer studies that examine it. So while the low number limits generalizability, they provide insight into this issue.

6. Conclusions

Parental efficacy and its relationship to the ability to promote healthy behaviors has been confirmed by most of the reviewed studies. The relationship of efficacy to child present weight or weight changes has not been explored enough to make any meaningful connections.

References

Affendi, I., Nor Asiah, M., Normi, M., Mohd Hatta, A., Noor Aliza, L., Sabtuah, M., … Suraiya, S. (2018). Association between Self-Efficacy and Health Behavior in Disease Control: A Systematic Review. *Global Journal of Health Science*, *10*(1), 18-36. https://doi.org/10.5539/gjhs.v10n1p18

Baidal, J., Criss, S., Goldman, R., Perkins, M., Cunningham, C., & Taveras, E. (2015). Reducing Hispanic children's obesity risk factors in the first 1000 days of life: A Qualitative Analysis. *Journal of Obesity*, 215. https://doi.org/10.1155/2015/945918

Berry, D., McMurray, R., Schwartz, T., Hall, E., Neal, M., & Adatorwover, R. (2017). A cluster randomized controlled trial for child and parent weight management: Children and parents randomized to the intervention group have correlated changes in adiposity. *BMC Obesity*, *4*, 39. https://doi.org/10.1186/s40608-017-0175-z

Bohman, B., Ghaderi, A., & Rassmussen, F. (2013). Psychometric properties of a new measure of parental self-efficacy for promoting healthy physical activity and dietary behaviors in children. *European Journal of Psychological Assessment*, *29*(4), 291-298. https://doi.org/10.1027/1015-5759/a000159

Bohman, B., Rasmussen, F., & Ghaderi, A. (2016). Development and psychometric evaluation of a context-based parental self-efficacy instrument for healthy dietary and physical activity behaviors in preschool children. *International Journal of Behavioral Nutrition and Physical Activity*, *13*, 110. https://doi.org/10.1186/s12966-016-0438-y

Campbell, K. J., Hesketh, K. D., Silverii, A., & Abbott, G. (2010). Maternal self-efficacy regarding children's eating and sedentary behaviors in the early years: Associations with children's food intake and sedentary behaviors. *International Journal of Pediatric Obesity*, *5*, 501-508. https://doi.org/10.3109/17477161003777425

cKee, C., Long, L., Southward, L., Walker, B., & McCown, J. (2016). The role of parental misperception of child's body weight in childhood obesity. *Journal of Pediatric Nursing*, *31*, 196-203. https://doi.org/10.1016/j.pedn.2015.10.003

Cullinan, & Cawley. (2017). Parental misclassification of child overweight/obese status: The role of parental education and parental weight status. *Economics and Human Biology*, *24*, 92-103. https://doi.org/10.1016/j.ehb.2016.11.001

Decker, J. W. (2012). Initial development and testing of a questionnaire of parental self-efficacy for enacting healthy lifestyles in their children. *Journal for Specialists in Pediatric Nursing*, *17*, 147-158. https://doi.org/10.1111/j.1744-6155.2012.00330.x

Ekim, A. (2016). The effect of parents' self-efficacy perception on healthy eating and physical activity behaviors of Turkish preschool children. *Comprehensive Child and Adolescent Nursing*, *39*, 30-40.

Enebrink, P., Danneman, M., Mattsson, V., Ulfsdotter, M., Jalling, C., & Lindberg, L. (2015). ABC for Parents: Pilot study of a universal 4-session program shows increased parenting skills, self-efficacy, and child well-being. *Journal of Child Family Studies*, *24*, 1917-1931.

Gerads, S., Hummel, K., Dagnelie, P., de Vries, N., & Kremers, S. (2013). Parental self-efficacy in childhood overweight: Validation of the Lifestyle Behavoir Checklist in the Netherlands. *International Journal of Behavioral Nutrition and Physical Activity*, *10*(7), 11. https://doi.org/10.1186/1479-5868-10-7

Gibson, L., Allen, K., Byrne, S., Clark, K., Blair, E., Davis, E., & Zubrick, S. (2016). Childhood Overweight and Obesity: Maternal and Family Factors. *Journal of Child Family Studies*, *25*, 3236-3246. https://doi.org/10.1007/s10826-016-0485-7

Grossklaus, H., & Marvicsin, D. (2014). Parenting Efficacy and its relationship to the prevention of childhood obesity. *Pediatric Nursing*, *40*(2), 69-86.

Heerman, W., Lounds Taylor, J., Wallston, K., & Barkin, S. (2017). Parenting self-efficacy, parent depression, and healthy childhood behaviors in a low-income minority population: A cross sectional analysis. *Maternal Child Health Journal*, *21*, 1156-1165. https://doi.org/10.1007/s10995-016-2214-7

Hodges, E., Smith, C., Tidwell, S., & Berry, D. (2013). Promoting physical activity in preschoolers to prevent obesity: A review of the literature. *Journal of Pediatric Nursing*, *28*, 3-19. https://doi.org/10.1016/j.pedn.2012.01.002

Howe, C., Alexander, G., & Stevenson, J. (2017). Parents' underestimation of child weight: Implications for obesity prevention. *Journal of Pediatric Nursing*, *37*, 57-61. https://doi.org/10.1016/j.pedn.2017.06.005

Ice, C. L., Neal, W. A., & Cottrell, L. (2014). Parental efficacy and role responsibility for assisting in child's healthful behaviors. *Education and Urban Society*, *46*, 699-715. https://doi.org/10.1177/0013124512468004

Leary, J., Ice, C., Neal, W., & Cottrell, L. (2013). Parent and child weight status predict weight-related behavior change. *Journal of Communication in Healthcare*, *6*(2), 115-121. https://doi.org/10.1179/1753807612Y.0000000021

Loprinzi, P., Schary, D., Beets, M., Leary, J., & Cardinal, B. (2013). Association between hypothesized parental influences and preschool children's physical activity behavior. *American Journal of Health Education*, *44*, 9-18. https://doi.org/10.1080/19325037.2012.749685

Lundahl, A., Kidwell, K., & Nelson, T. (2014). Parental underestimates of child weight: A meta-analysis. *Pediatrics*, *133*(3), e689-e703. https://doi.org/10.1542/peds.2013-2690

Marvicsin, D., & Danford, C. (2013). Parenting Efficacy Related to Childhood Obesity: Comparison of Parent and Child Perceptions. *Journal of Pediatric Nursing*, *28*(5), 422-429. https://doi.org/10.1016/j.pedn.2012.11.004

Montigny, F., & Lacharite, C. (2005). Perceived parental efficacy: concept analysis. *Journal of Advanced Nursing*, *49*(4), 387-396. https://doi.org/10.1111/j.1365-2648.2004.03302.x

Nyberg, G., Norman, A., Sundblom, E., Zeebari, Z., & Elinder, L. (2016). Effectiveness of a universal parental support programme to promote health behaviours and prevent overweight and obesity in

6-year-old children in disadvantaged areas, the Healthy School Start Study II, a cluster-randomised controlled study. *International Journal of Behavioral Nutrition and Physical Activity*, *13*(4), 1-14. https://doi.org/10.1186/s12966-016-0327-4

Parekh, N., Henriksson, P., Nystrom, C., Silfvernagel, K., Ruiz, J., Ortega, F., … Lof, M. (2018). Associations of parental self-efficacy with diet, physical activity, body composition, and cardiorespiratory fitness in Swedish preschoolers: Results from the MINISTOP Trial. *Health Education and Behavior*, *45*(2), 238-246. https://doi.org/10.1177/1090198117714019

Rhee, K. (2008). Childhood overweight and the relationship between parent behaviors, parenting style, and family functioning. *The Annals of the American Academy of Political and Social Science*, *615*, 12-37. https://doi.org/10.1177/0002716207308400

Salarkia, N., Omidvar, N., Zaeri, F., Zeinab, H., & Neyestani, T. (2016). Mother's self-efficacy mediates the relationship between household food insecurity and maternal infant feeding styles. *Maternal Child Health Journal*, *20*, 602-612. https://doi.org/10.1007/s10995-015-1859-y

Scaglioni, S., Salvioni, M., & Galimberti, C. (2008). Influence of parental attitudes in the development of children eating behavior. *British Journal of Nutrition*, *99*(1), S22-S25. https://doi.org/10.1017/S0007114508892471

Williams, S., Van Lippevelde, W., Magarey, A., Moores, C., Croyden, D., Esdaile, E., & Daniels, L. (2017). Parent engagement and attendance in PEACH QLD—An up-scaled parent-led childhood obesity program. *BMC Public Health*, *17*, 559. https://doi.org/10.1186/s12889-017-4466-6

Willis, T., Evans, C., Willis, T. A., George, J., Hunt, C., Roberts, K., … Rudolf, M. (2014). Combating child obesity: Impact of HENRY on parenting and family lifestyle. *Pediatric Obesity*, *9*(5), 339-350. https://doi.org/10.1111/j.2047-6310.2013.00183.x

Wright, J., Adams, W., Laforge, R., Berry, D., & Friedman, R., (2014). Assessing parental self-efficacy for obesity prevention related behaviors. *International Journal of Behavioral Nutrition and Physical Activity*, *11*(53), 1-18. https://doi.org/10.1186/1479-5868-11-53

Xu, H., Wen, L., & Rissel, C. (2014). Associations of maternal influences with outdoor play and screen time of two-year-olds: Findings from the healthy beginnings trial. *Journal of Paediatrics and Child Health*, *50*, 680-686. https://doi.org/10.1111/jpc.12604

Yu, M. (2011). Parenting efficacy: How can service providers help? *Family Relationships Quarterly*, *19*, 1-8.