2022

Childhood obesity and adverse childhood experiences: the role of Medicaid expansion

Sonya Dunlap

CHILDHOOD OBESITY AND ADVERSE CHILDHOOD EXPERIENCES: THE ROLE OF MEDICAID EXPANSION

ABSTRACT

Introduction: Obesity was defined as a Body Mass Index (BMI) over the 95th percentile as determined by the Centers for Disease Control and Prevention (CDC). Childhood obesity has been a worldwide concern, but has disproportionately affected the socioeconomically disadvantaged, racial/ethical minorities, and rural children. The presence of Adverse Childhood Experiences (ACEs) contributed to social and health problems. ACEs included the areas of domestic violence, mental illness, neighborhood violence, parent or guardian death, divorce or separation, parent or guardian incarceration, and substance misuse.

Purpose of Study: The purpose of this research was to compare the ACEs scores with childhood obesity percentages in WV and determine if there is a correlation across the country with elevated childhood obesity and high ACEs. In addition, the obesity rates of the twelve states who did not participate in Medicaid expansion will be compared to the ones who did participate.

Methodology: A literature review was utilized with a total of 59 relevant citations collected from 4 databases and various websites. After review, 28 sources were selected as relevant to the study and used. Semi-structured interviews were conducted via telephone and email. The interviews were approved by an institutional review board with informed consent being obtained verbally. The articles included in the study were limited to those conducted in the United States (US) and published in English between the years of 2011 and 2022.

Results: The results showed that there is a correlation between elevated ACEs scores and elevated BMI above the 95th percentile categorizing them as obese. In addition, there was a correlation between lowered obesity rates in states that accepted Medicaid Expansion.

Discussion/Conclusion: The research demonstrated the relationship between elevated ACEs and BMI as well as the positive results available with the states participating in Medicaid Expansion.

Key Words: ACEs, Childhood Obesity, Medicaid Expansion, Obesity Intervention

INTRODUCTION

Childhood obesity has remained a worldwide epidemic while the rates of obesity tripled since the late 1970s (Aris & Block, 2022). Obesity was defined by the Centers for Disease Control and Prevention (CDC) as a Body Mass Index (BMI) at or over the ninety-fifth percentile. BMI was calculated by dividing a person's weight by the square of height (w/h^2=BMI). The CDC has developed charts by age and sex that listed the percentage cutoffs (CDC, 2021). Childhood obesity disproportionately affected socioeconomically disadvantaged, racial/ethnic minority, and rural children (Vogeltanz-Holm, Holm, 2018).

Research into the causes and treatment of childhood obesity have led to the formation of task forces, programs, and initiatives at the national and state level. Prevention of childhood obesity was proven to be a more viable approach as opposed to treating adults with obesity and the other non-communicable diseases (NCDs) that often accompany it (Pandita, Pandita, Pawar, Tariq, and Kaul, 2016). There was no single cause of childhood obesity, but the association between obesity and other conditions has made it a public health concern for children and adolescents (Sanyaolu, Okorie, Qi, Locke, & Rehman, 2019). The cost of treating childhood obesity in 2015 was double the amount annually compared to non-obese children (Hay, 2021).

A contributing factor called adverse childhood experiences (ACEs) has been shown to result in higher risk of health and social problems including a 46% increase in obesity in adulthood (Wiss, Brewerton, 2020). ACEs scores were determined in areas of domestic violence, mental illness, neighborhood violence, parent or guardian death, divorce or separation, parent or

guardian incarceration, and substance misuse. ACEs stimulated a toxic stress response that affected neurodevelopment, behavior, and overall physical and mental health (Harrada, et al, 2021). Even though determinants of ACEs occurred across all socioeconomic statuses, they were disproportionately high for minorities and lower socioeconomic households where they faced challenges in income, housing, nutritious foods, regular primary care, and fewer areas for safe physical activities (Moore, Hernandez Gray, Lanier, 2016). These issues impacted overall health and quality of life.

Treatment of childhood obesity required multicomponent interventions including dietary modifications, physical activity changes, behavioral strategies, and active parental involvement to be made routinely available to children with obesity (Wilfley et al., 2017). The cost of treating ongoing childhood obesity resulted in more emergency department visits, prescription drug costs, and specialty doctor visits (Wilfley et al., 2017). Although there were treatment interventions available for childhood obesity, there was a widespread lack of availability to evidence-based programs due to insurance coverage (Fowler et al., 2021).

Multi-disciplinary treatment was indicated as a preferred intervention because culture is so engrained in behavior, it is critical that overweight and obesity management interventions consider community environment, practices, and beliefs (Burton & Smith, 2020). Social cognitive theories (SGT) were utilized in programs along with community-based research methods to ensure aspects were culturally appropriate.

Considering the prevalence of obesity and elevated ACEs in financially struggling populations, Medicaid became the most common payor in the treatment of obesity (Moore, Hernandez Gray, Lanier, 2016). Medicaid Managed Care Organizations (MMCO) or contracted health plans collaborated with community organizations, local health departments, and key stakeholders to research and implement interventions with support from the Robert Wood

Johnson Foundation. They launched the Childhood Obesity Prevention and Treatment (CHOPT) toolkit in 2016.

Thirty-nine states participated in Medicaid expansion which was proposed through the Affordable Care Act (ACA). The major goals of the ACA were to provide health insurance coverage, access to care, and improved patient outcomes (Mazurendo, Balio, Agarwal, Carroll, & Menachemi, 2018). One study of the expansion determined that it increased coverage, service use, quality of care, and Medicaid spending (Mazurenko, Balio, Agarwal, Carroll, & Menachemi, 2018). The ACA mandated childhood obesity coverage with no deductibles or cost sharing (Bradley, 2017). These benefits also applied to Medicaid recipients but not in the states who did not participate in Medicaid expansion. There were twelve states who did not participate in Medicaid expansion. Coverage began in January, 2014.

West Virginia (WV) participated in Medicaid expansion and was eligible for the coordinated benefits for childhood obesity. WV has had one of the highest percentages of childhood obesity in the nation which was 20.3% in 2017 (Howard, 2018). WV also has higher percentages than the national average in ACEs (National Survey of Children's Health, 2020). The annual cost of treating obesity for individuals with two or more ACEs was $728 billion in the US (Brenner, 2019). Medicaid expansion reported improvements in access to and quality of care, as well as to some degree in health, have occurred (Mazurenko et al., 2018).

The purpose of this research was to compare the ACEs scores with childhood obesity percentages and determine if there is a correlation across the country with elevated childhood obesity and high ACEs. In addition, the obesity and ACEs rates of the twelve states who did not participate in Medicaid expansion will be compared to the ones who did participate.

METHODOLOGY

The working hypothesis was that increased ACEs results in higher BMI or percentages of childhood obesity. The secondary hypothesis was that Medicaid expansion through the ACA had a positive effect on reducing childhood obesity due to increased access to treatment.

The methodology of the research was a literature review with a semi structured interview of a WV public health expert. The conceptual framework for this review was adapted from the steps and research used by Yao, Chu, and Li (2010). (APPENDIX A, Figure 1). The literature review was conducted in three stages: 1) developing a search strategy; 2) determining and analyzing relevant literature; 3) selecting appropriate databases for inclusion. All studies were analyzed and selected for relevance to the subject matter of childhood obesity, ACEs, and Medicaid expansion.

Step 1: Literature Identification and Collection

Key words used for inclusion of the study were: "Childhood Obesity" AND "Adverse Childhood Experiences (ACEs)" AND "Medicaid Expansion," AND "Obesity Intervention." The electronic databases utilized to obtain peer-reviewed literature were EBSCOhost, ProQuest, PubMed and Google Scholar. Articles were reviewed utilizing PRISMA (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009), the search identified 59 relevant citations and excluded articles (n=31) if they did not meet inclusion principles. These 28 references were subject to full-text review and were included in the references section. (Apendix B)

Step 2: Literature Analysis

In an attempt to collect the most recent data, only sources from 2012-2022 written in English were used. Primary and secondary data from articles, literature reviews, research studies, and reports written in the United States were included in this research. The literature review included 28 references, which were assessed for information about the research project. SD conducted the

literature search, and it was validated by A.C., who acted as the second reader to check if references met the inclusion criteria of the research study.

Step 3: Selection of Databases

Primary data from the Centers for Disease Control (CDC), the US Census, and National Survey of Children's Health along with literature databases EBSCOhost, Google Scholar, PubMed, and ProQuest were used and relevant categories were identified.

Semi-Structured Interview

A total of eleven questions were constructed for a pediatrician in WV and an executive from Women, Infants, and Children (WIC). (Apendix A)

RESULTS

A study of 105,000 students conducted by the University of Minnesota in 2018 concluded that youth with more ACEs were much more likely to be obese than peers with fewer or no ACEs (Davis et. all, 2018). Their study captured ACEs during the period of time they occurred. Students with six ACEs were 2.0 and 4.24 times as likely to be obese or severely obese when compared with other students with lower ACEs (Davis et all, 2018). The corresponding data retrieved from Childhealthdata.org lists Minnesota's overall ACEs score to be 14.0 with an obesity rate of 11.7%. Compared to the rest of the country, Minnesota's numbers are in the low range compared to West Virginia with ACEs at 24.6 and obesity at 21.9% (Child and Adolescent Health Measures Initiative, 2021).

A California study on healthy weight behavior included questions regarding physical activity, television time, electronics time, family meals, and sleep. Significant associations were found between parent divorce, domestic violence, and household substance use and amount of television use, electronic use, family meals, and sleep. (Harrada et all, 2018). Overall, they

found a sloping pattern of decreasing healthy weight behaviors as the number of ACEs increased.

In a 2021 study of nearly 30 million children, 15% with obesity, obesity was associated with more ACEs compared with other children of normal BMI (Kyler, Hall, Halvorson, & Davis, 2021). Children with obesity were also more like to report ACEs. This study reported the importance of preventative screen and social interventions with children.

There was a prevalence of obesity reported among children experiencing two or more ACEs (20.4%), when compared with 12.5% among children with no ACEs. The presence of ACEs can cause toxic stress and induce long-term changes in the endocrine, immune, and nervous systems. If they are not addressed, they may create significant psychological barriers to weight loss (Jannah, 2017).

The Home Sweet Home (HSH) program was designed for rural, low-income families in the Southern US. It utilized social cognitive theory (SCT) and mindful eating strategies with caregivers of preschool aged children (Knol, et all, 2016). They targeted four behavioral outcomes: reducing sedentary activities, increasing the number of family meals served per week, reducing portion sizes using mindful eating techniques, and reducing high calorie/low nutritional value foods. Role modeling of mindful eating significantly improved (p=.006) after the three-week monitoring period as well as role modeling of healthy eating habits and physical activity (p=.06, and p-.02, respectively). There was no change in availability of fruits and vegetables in the home for children (Knol, et all, 2016). The study did not include any changes in BMI.

A three-year elementary school program was designed for American Indian and white rural students in North Dakota. The Coordinated Approach to Child Health Program (CATCH) was used as it was the largest, most comprehensive, and most rigorously evaluated elementary school-based obesity prevention program. SCT was applied in health lessons teaching reciprocal

determinism, observational learning, reinforcement, self-regulation, group- and self-efficacy (Vogeltanz-Holm, Holm, 2018). BMI was measured and tracked at the beginning of third grade as a baseline, end of third grade, end of fourth grade, and end of fifth grade and were converted to *z* scores (zBMI). The American Indian scores increased from beginning to end of third grade (0.82 to 0.93), but did not change from baseline to the end of the program (0.85). White students zBMI scores decreased from baseline (0.66) to the end of the program (0.51). This was the first long-term study of the CATCH program for American Indians. Since BMI did not increase across the study period, it demonstrated a beneficial effect.

A study in 2013 used Motivational Interviewing (MI) with the High Five for Kids study which was a primary care-based obesity intervention program to change BMI and obesity related behaviors such as reducing television time (or screen time) and reducing high calorie low nutritional value snacks or fast food (Taveras et all, 2011). MI was defined as a communication technique used by trained professionals which is collaborative in nature and focuses on changing behaviors and empowering the attainment of a goal (Baidal, et all, 2013). Using nonjudgmental MI communication techniques with parents was viewed as providing a supportive environment and had positive perceptions and results.

The intergenerational association of obesity and ACEs was studied and concluded that ACEs has lasting health effects that span across generations from parent to child (Le-Scherban, et all, 2018). Parents with ACEs often experienced adult mental health disorders, adult obesity, substance abuse, and food insecurity which has critical implications for children being raised by them (Le-Scherban et all, 2018). This study concluded that parental ACEs contributed to a series of risks throughout the parent's life which resulted in unhealthy living conditions that affects parenting.

In 2018, a follow-up survey was administered to participants in a 2010 study called Eating and Activity over Time (EAT). The participants in 2010 were middle and senior high school students at twenty urban public schools in Minnesota. The follow-up self-report assessed frequency of dieting and weight status. Results indicated participants with ACEs experienced significantly higher levels of disordered eating and higher BMI compared to those with no or low ACEs (Hazzard, et all, 2021).

The 2019-2020 National Survey of Children's Health recorded ACEs and childhood obesity information from every state. A table was created and analysis of variance calculated to determine whether higher ACEs scores would also affect higher percentage of obesity. There was a significant statistical relationship between the two factors. (APENDIX C) This data was used to compare the states who participated in Medicaid Expansion with those who did not. The states who did participate showed lower levels of ACEs and obesity rates when compared to the twelve states who did not elect Medicaid Expansion (APENDIX D).

LIMITATIONS

This study was limited by the number of data bases used to obtain literature reviews, search strategies used to distinguish keywords, or the sources used. Research and publication bias were a limitation as well. In addition, the Medicaid expansion program evaluation will be an ongoing process of review, and more research will be needed to determine its effects on childhood obesity.

PRACTICAL IMPLICATIONS

The study demonstrated the need for more research on interventions to reduce ACEs and combat the prevalence of obesity in our culture. There were positive results from families who received MI from their primary care office. This identified a need for more training in MI techniques.

With childhood obesity being stated by multiple reports as epidemic proportions in our country, a centralized BMI database needs to be monitored with interventions implemented and success rates to verify the effectiveness of various treatments. Also, there was an implied need for parental support in raising children especially where difficulties in home and food insecurity exist. Reduction of ACEs resulted in healthier children, so helping the families experiencing adversity was a logical conclusion.

DISCUSSION

The Women, Infants, and Children (WIC) program in Kanawha County, WV, program educates and advises families on nutritional needs of children from birth to age five. They utilized a motivational interviewing strategy while discussing healthy food choices, habits, and shopping guides (H. LeBarron, personal communication, March 3, 2022). All participants must complete a Value Enhanced Nutritional Assessment that guides planning participant-centered, health outcome-based plans. To be eligible for the WIC program they had to meet residential, income, and nutritional risk requirements. The nutritional risk included an evaluation by a physician to indicate dietary-based or medical-based conditions including height and weight. Ms. LeBarron stated that if a child had a BMI at or above 95th percentile for more than two of the regularly scheduled three-month meetings, then a referral could be made to a pediatric center. She stated that was very rare and "tricky" to refer since the pediatric weight loss clinic is for ages 8-18. She also stated that having access to WVHIN allows WIC to verify BMI, immunizations, and kept medical appointments.

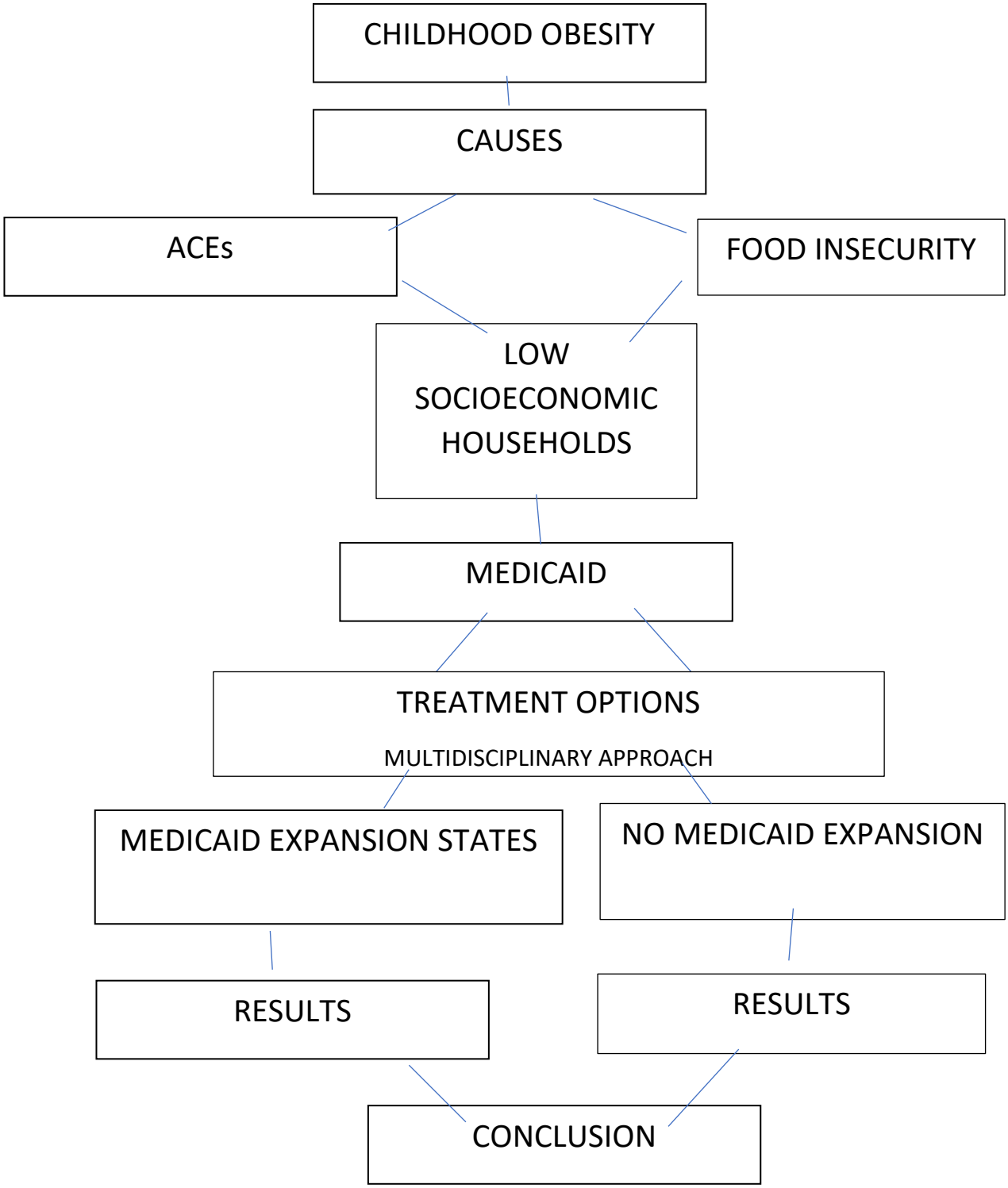
CONCLUSIONS

The purpose of the research was to determine if there was a correlation between elevated ACEs and BMI, and then to determine if the states who participated in Medicaid expansion saw a benefit to lowering ACEs and BMI in children. The data gathered confirmed both hypotheses.

This knowledge supported the need to continue with diligence to actively screen and provide treatment for the children in need.

APPENDIX A (Figure 1)

CONCEPTUAL FRAMEWORK



APPENDIX A (Figure 2)

Semi-Structured Interview Questions

1. You have been very involved in studying the effects of Adverse Childhood Experiences (ACEs). Why do you believe there is a link between ACEs and obesity?

2. Is there a collaborative effort taking place within the state to address the origins of childhood obesity? Why or why not?

3. Are pediatricians and/or family health practitioners adequately trained to identify and treat childhood obesity? Why or why not?

4. What methods or practices are needed to obtain better data regarding childhood obesity?

5. In your opinion, is there enough attention being given to childhood obesity? Can you please explain your answer in terms of grants, research projects, interventions, etc.?

6. In your opinion, how can families obtain the best resources and training on preventing childhood obesity?

7. Can you describe an ideal intervention for childhood obesity without regard to cost, facilities, or staffing?

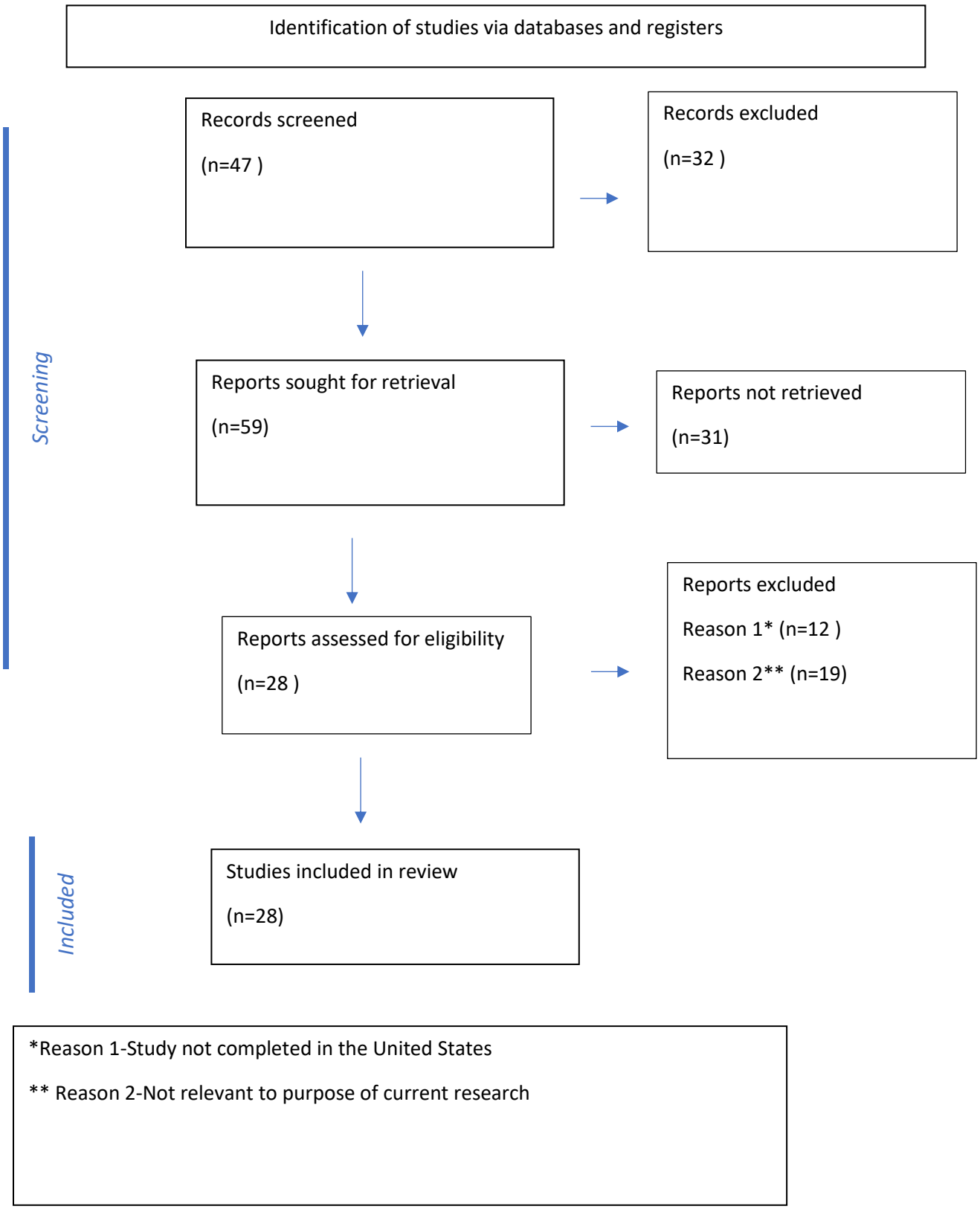
8. What is your opinion on the cognitive-behavioral approach to treatment of childhood obesity? Can you give an example of it?

9. What interventions to childhood obesity do you believe show the most promise?

10. Has the COVID-19 pandemic affected childhood obesity? Can you explain it?

11. What is the data showing regarding recent trends in WV's childhood obesity rate?

APPENDIX B


Identification of studies via databases and registers
Records screened
(n=47)
Records excluded
(n=32)
Screening
Reports sought for retrieval
(n=59)
Reports not retrieved
(n=31)
Reports assessed for eligibility
(n=28)
Reports excluded
Reason 1* (n=12)
Reason 2** (n=19)
Included
Studies included in review
(n=28)
*Reason 1-Study not completed in the United States
** Reason 2-Not relevant to purpose of current research

APPENDIX C

State	ACES	Obesity Rate
Alabama	20.5	21.8
Alaska	21.5	17.8
Arizona	22.4	10.2
Arkansas	26.4	20.6
California	16	15.2
Colorado	20.2	11.2
Connecticut	15.8	15.3
Delaware	19.1	18.9
DC	20.9	14.2
Florida	18.2	15.8
Georgia	21.6	18.9
Hawaii	15.4	15.5
Idaho	18.7	13.3
Illinois	15	17.4
Indiana	20.9	15.6
Iowa	19.2	16.9
Kansas	19.8	11.7
Kentucky	19.9	23.8
Louisiana	23.6	22.2
Maine	21.6	13.7
Maryland	15.3	16.7
Massachusetts	13.7	12.2
Michigan	18.1	15.7
Minnesota	14	11.7
Mississippi	23.1	22.3
Missouri	17.1	19.6
Montana	25.2	10
Nebraska	16.7	12.6
Nevada	18.5	16
New Hampshire	17.4	13.5
New Jersey	13.9	13.8
New Mexico	25.1	15.3
New York	15.5	11.5
North Carolina	16.6	19.8
North Dakota	18.7	10.5
Ohio	20.4	17.2
Oklahoma	21.1	18.7
Oregon	19.2	13.7
Pennsylvania	17.7	15.1
Rhode Island	19.3	16.7
South Carolina	20.8	20.1

South Dakota	20	15.2
Tennessee	20.6	20.8
Texas	19.1	20.3
Utah	15.9	10.3
Vermont	22	14
Virginia	16.3	14.9
Washington	16	13.2
West Virginia	24.6	21.9
Wisconsin	17.7	14.6
Wyoming	25.5	11
Average	**19.25098**	**15.86078**

Anova: Single Factor

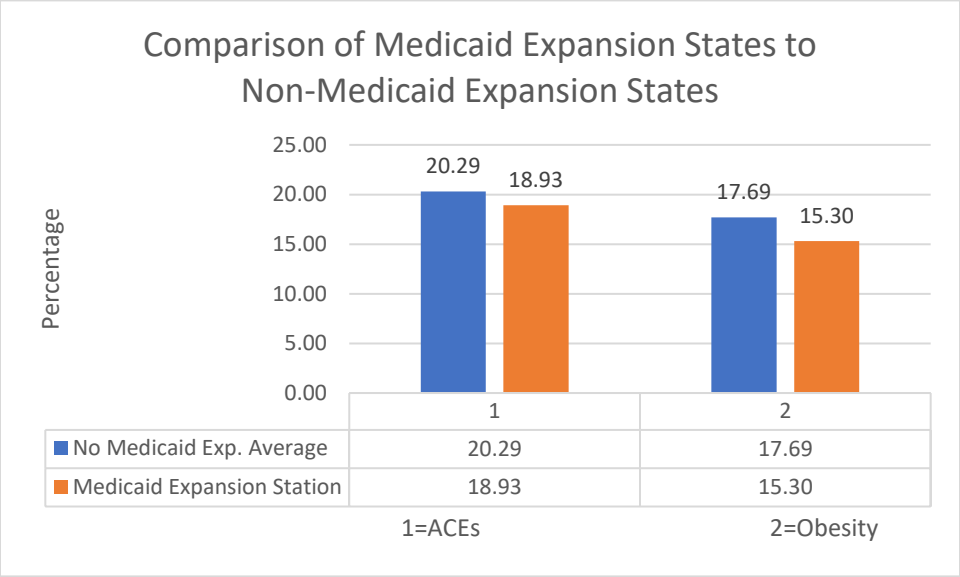
SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
ACES	51	981.8	19.25098	10.12895
Obesity Rate	51	808.9	15.86078	13.20683

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	293.0825	1	293.0825	25.11872	2.33E-06	3.936143
Within Groups	1166.789	100	11.66789			
Total	1459.871	101				

APPENDIX D


Comparison of Medicaid Expansion States to Non-Medicaid Expansion States
Percentage
25.00
20.00
15.00
10.00
5.00
0.00
20.29
18.93
17.69
15.30
1
2
No Medicaid Exp. Average
20.29
17.69
Medicaid Expansion Station
18.93
15.30
1=ACEs
2=Obesity