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Adverse Childhood Experiences and Creating a Culture of Support in the Classroom

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Abstract

Adverse childhood experiences (ACEs) are traumatic events that occur from infancy through teenage years. Research shows that students who have been exposed to one ACE have a greater chance of experiencing more traumatic events in their lifetime. Students with ACEs are at a greater percentage to struggle with behaviors, academics, health concerns, and poor school attendance. Schools are researching and training teachers to implement interventions to support children exposed to trauma. Teachers who are purposeful with their classroom environment to support students' needs and create a safe classroom environment for students exposed to ACEs.

Keywords: adverse childhood experiences, trauma, classroom environment

Adverse Childhood Experiences and Classroom Support

Research shows that more than two-thirds of children have experienced at least one traumatic event by the age of sixteen, as stated by the Substance Abuse and Mental Health Services Administration (2020). Adverse childhood experiences, or ACEs, are traumatic events that take place from infancy through the teenage years (CDC, 2020). Examples of ACEs may include physical abuse, emotional abuse, sexual abuse, divorce, incarceration, substance misuse, or the mental illness of a family member (CDC, 2020). Exposure to ACEs can have negative effects on physical and mental health well into adulthood (Bellis et al., 2017).

Trauma can impact numerous areas of students' development, including cognitive development, physical development, and social-emotional development (Alisic, 2012). These factors have been known to cause negative effects on students' academic careers. Trauma can decrease a student's interest and ability to flourish in many aspects of school (Harper & Temkin, 2019) as well as diminish students' abilities to form healthy relationships with peers and teachers (National Child Traumatic Stress Network Schools Committee, 2008). Students with ACEs need an environment with stability, security, and dependability to counteract their background of trauma (Holmes et al., 2014). Stability helps children to realize that they are in control and can learn ways to handle traumatic situations (National Child Traumatic Stress Network Schools Committee, 2008). A safe culture and climate at school support the academic, social-emotional, and mental needs of students who may have experienced an ACE (Harper & Temkin, 2019). When school staff can communicate and support students who have experienced ACEs with the proper opportunities and calm classroom environments, students can then overcome the negative effects of trauma (Harper & Temkin, 2019).

The purpose of this literature review is to examine the research on ACEs and the negative effects of trauma on students. It will also review the research surrounding strategies educators can use to support students with ACEs, and how educators can create a safe physical environment for their students within the classroom. The research was conducted by retrieving, reading, and reviewing articles published in scholarly journals from ERIC and other sources that have addressed adverse childhood experiences, strategies used by schools to support students with ACEs, and classroom environmental factors that can support students with ACEs.

Literature Review

Adverse Childhood Experiences

Adverse childhood experiences (ACEs) are defined as traumatic experiences that affect children well into adulthood (Felitti et al., 1998). ACEs exposure is widespread in the United States (Blodgett & Lanigan, 2018). The CDC states that about 61% of adults surveyed across the United States have had at least one type of ACE, and about one in six adults reported that they have experienced four or more types of ACEs (2020). There are ten ACEs, including five types of maltreatment (physical, verbal, emotional, sexual abuse, and neglect) and five types of family dysfunction (parental separation; living with a family member who has a mental illness, substance abuse, or is engaged in criminal behavior; and witnessing violence among adults in the home) (CDC, 2020).

Trauma resulting from ACEs may be of three types: acute, chronic, and complex (CDC, 2020). Acute trauma refers to a one-time experience in a child's life. Chronic trauma refers to repeated exposures on the mind and body. And complex trauma refers to ongoing chronic trauma from close caregivers, with little to no chance of escape (CDC, 2020). When a child is exposed to trauma, their survival mode takes over. As a result, academics and behaviors are the least of

ACE students' worries (Plumb, Bush & Kersevich, 2016). Plus, trauma can diminish students'

abilities to form healthy relationships with peers and teachers (National Child Traumatic Stress

Network Schools Committee, 2020).

Childhood trauma has happened to many Americans. The most well-known ACEs study

took place in the United States by Kaiser Permanente from 1995-1997. Surveys were sent to

13,494 adults after a medical evaluation. The research found 36.1% of the participants had zero

ACEs, 26% had one ACE, 9.5% had three ACEs, and 12.5% had four or more ACEs (CDC,

2016). The findings of the study showed that if a person had one ACE, they had a greater than

85% chance of experiencing more traumatic events within their lifetime (Felitti et al., 1998).

As exposure to ACE-related stressors increases, so does the risk for a vast array of

negative outcomes. Research conducted by Felitti et al., (1998), found that if a person has six or

more ACEs, they have a greater chance of mortality twenty years earlier than a person with zero

ACEs. The study discovered common factors linking ACEs with adult chronic diseases, mental

illness, divorce, and substance abuse (Felitti et al., 1998). The CDC (2020) associates ACEs with

life-long stress. As the number of ACEs continues to be on the rise, the CDC explains that

children exposed to toxic stress have a greater chance of lacking stable healthy relationships, an

absence that may in turn lead to struggles in their adulthood (2020). These adults can then pass

the effects on to their children, triggering a cycle of lifetime struggles (CDC, 2020).

The Negative Impact of Trauma on Students

Trauma is a deeply distressing experience that can cause adverse reactions in a child's

day-to-day life, including their cognitive development, behavior, learning, and social-emotional

development (Aliscis, 2012; Plumb et al., 2016). The American Psychological Association

describes trauma as an emotional disturbance within a tragic event (2021). According to the

National Child Traumatic Stress Network (2020), traumatic events hinder the ability of young

children to establish and maintain positive adult bonds. Students who have been exposed to

trauma may have behaviors that overwhelm and frustrate their teachers (Statman-Weil, 2015).

      Student Attendance. Blodgett and Lanigan (2018) researched the relationship between

students who have experienced at least one ACE and their school attendance, behavior, and

academics. Blodgett and Lanigan used the same practice as the National Incidences Study of

Child Abuse and Neglect, with the teachers being the reporters of ACE students (2018). The

teachers were given formal training to assess the students before administering the surveys.

Attendance problems were defined by students commonly arriving late, leaving early, or absent

throughout the week. The study found that students with high ACE scores had a 13% higher rate

of attendance problems, as compared to students without ACE scores. Of the 2,101 children from

grades K-6 who were randomly selected to participate in the research, the types of ACEs with

the highest student percentages in this study were parents' divorce at 36%, Child Protective

Services involvement at 9%, domestic violence at 9%, and residential instability at 9%. Of the

students exposed to these types of ACEs, teachers reported that 51% of students had no concerns

about attendance, behavior, or academics, 27% of students had one area of concern, 17% of

those students had two areas of concern, and 5% of students had all three areas as concerns.

Almost half of the children who had experienced an ACE also experienced difficulty with

attendance, behavior, or academics (Blodgett & Lanigan, 2018). The effects of trauma can

ultimately influence a child's educational performance at school.

      Daily student attendance has been known to affect academic performance. About 14% of

students in the United States are chronically absent (US Department of Education). Students

affected by ACEs are more likely to be less engaged in school and have poor attendance, and

higher chances of retention (Bethell et al., 2014; Stempel et al., 2017). A study by Stempel et al.

(2017) researched the connection between school absenteeism and ACEs. The study was

conducted in partnership with the National Center for Health Statistics and was sponsored by the

Maternal and Child Health Bureau. Chronic absenteeism was defined as fifteen or more days

missed each year as the cut-off to be consistent with the US Department of Education Office of

Civil Rights definition (2017). The study surveyed the parents of 58,765 students ages six to

seventeen year olds who were enrolled in school, and whose parents indicated their child had at

least one ACE. The study found the five most common individual ACEs reported were financial

hardship (20.2%), parental divorce (19.2%), family substance abuse (9.7%), and witnessing or

experiencing neighborhood violence (9%). The results revealed a relationship between chronic

absenteeism and children who had one or more ACEs, compared to students with no ACEs

(Stempel et al., 2017).

In addition to absenteeism, chronic stress from exposure to ACEs can impact

neurological, immunological, and hormonal development of children's health (Bellis et al.,

2018). A study by Bellis et al. (2018) researched the association between students who have

experienced ACEs and health and poor school attendance. Questionnaires were sent out to

randomly selected households, and a total of 2506 participants responded. The study used

questions from the CDC Prevention short ACE tool, and the Short Child Maltreatment

Questionnaire (Bellis et al., 2018). Common childhood health conditions measured in the

research were asthma, allergies, headaches, and constipation/diarrhea. In scoring attendance

results due to illness, school absenteeism was applied to children who had missed twenty or more

days per year. The results showed 48.5% of the individuals reported at least one ACE. That

statistic was comprised of 18.9% of children who had one ACE, 16.2% of children who had two

to three ACEs, and 13.4% with four or more ACEs. Digestive problems, poor childhood health, and school absenteeism showed the greatest increase with exposure to ACEs. Similar to Stempel et al. (2017), these findings suggest that students have a higher risk of poor attendance due to exposure to adverse childhood experiences.

Student Academics. Students with ACEs have been found to have a harder time with academics due to difficulty concentrating, lack of memorization skills, and difficulty staying on task (Hinojosa et al., 2019). Hinojosa et al. (2019) noted students exposed to trauma have a higher risk of being retained in school. Retention is defined as repeating a grade when the student is not academically or socially at grade-level expectations (US DOE, 2016). Retention has many disadvantages for the child such as loss of friends, lack of self-worth, and stigmas from peers and teachers. Retention is used in relation to low levels of state-wide standardized testing, behavior issues, and school suspensions (Hinojosa et al., 2019).

It has been shown that positive student-teacher relationships can help combat the effects of ACEs. Klem and Connell (2004) studied the relationship between teacher support, and student engagement and achievement. Klem and Connell's research used longitudinal data sets collected by the Institute for Research and Reform in Education (2004). Six elementary schools within one district were used in this study which pertained to teacher support and engagement and how much teachers contribute to student success. The research explored the degree to which teacher support matters, and how it predicts student engagement and student academic performance. Researchers measured support from teachers and students by using a scale of 1 to 4: "1" being not true at all to "4" being very true. According to student reports, 35% of the elementary students were found at at-risk levels for engagement, meaning they were disengaged from school, while 27% of elementary students were at optimal levels of engagement during school.

Teacher reports of student engagement were as follows: 22% of elementary students were in optimal categories and 40% of students showed disruptive behaviors and disengagement. Elementary students who felt teacher support were 89% more likely to feel engaged. Elementary students who felt low teacher support were twice as likely to feel disengaged from school. The findings indicate that teacher support is important for student engagement and academic performance.

Students who have been exposed to chronic traumatic events have been known to need school-wide academic interventions. Goodman, Miller, and West-Olatunji (2012) found that students with ACEs may experience anxiety, stress, and attention-deficit/hyperactivity disorder. The study questioned whether traumatic stress and socio-economic status may predict academic achievement. Their data was taken from the Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999, which included 3,387,565. The data measured children's social, emotional, cognitive, and physical development and also their school and home environments, curriculum, and teachers. Student academic achievement was measured by reading, mathematics, and scientific cognitive experiences. Students were tracked on individual education plans (IEP) and disengagement measured by total absences. The results indicated the percentage of students with traumatic stress increased as the number of school absences increased. Scores showed that students with traumatic stress had significantly lower scores than students without stress, a correlation indicating that traumatic stress negatively lowers students' standardized test scores. Their research concluded that traumatic stress is a significant factor in students' academics, showing the need for further student interventions (Goodman, Miller & West-Olatunji, 2012).

School Supports for Traumatized Students

Teachers that have the appropriate training to support students with ACES have been known to play a key role in their students' learning. Alisic (2012) researched teachers' perspectives on how to support students with trauma. The teachers within the study were of various experience, gender, and school background, and included twenty-one teachers from thirteen schools who had previous experience working with a student who had at least one ACE. The teachers were questioned through interviews on various topics pertaining to school protocols, experiences and strategies, colleagues, and needs. The results found that the teachers' former students had a vast array of traumatic experiences from neglect, serious accidents, domestic violence, and the loss of a parent. The students within the classroom had various behaviors and emotions including withdrawal, defiance, and acting out. Many teachers reported feeling unsure of how to address the needs of the students who experienced ACEs; the teachers struggled with providing needed support. Teachers felt that the social-emotional aspect of student needs was beyond their job, and social workers and psychologists were needed to further support their students. The teachers expressed the dilemma of not knowing where to draw the line of a supportive teacher and overstepping the boundaries of leaving the support to mental healthcare professionals. The teachers expressed a desire to support their students' needs, but also wanted to avoid being too emotionally involved. The research suggested training teachers on how to refer students with ACEs and their families when traumatic events occur and how to mentally debrief after situations occur (Alisic, 2012).

Blitz, Anderson & Saastanoinen (2016) researched teachers' perceptions of their preparedness to adequately support students with ACEs in an intentionally trauma-informed school environment. The research was conducted in an elementary school in the Northeast United States with around four hundred twenty-five students, from preschool through

kindergarten. The school had a 5% suspension rate, and state standardized tests were low. The areas of concern included disruptive behaviors, low comprehension, bully prevention, poverty, environmental and family concerns creating stress on the students, and poor living conditions. Twenty-six teachers and sixteen aides completed anonymous questionnaires pertaining to cultural ecology, perceptions of student behaviors, stress level, efficacy, and confidence. The teacher results shared the need for teacher awareness of student trauma and toxic stress, a need for student structure, guidance, and support, teacher needs for teaching tools to support students with ACEs, and support for the teachers' emotional secondary trauma and stress.

Many educators work with students that have been exposed to ACEs on a daily basis, yet studies like that conducted by Alisic (2012) and Blitz et al. (2016) have shown that teachers feel they need more training to properly support student needs. A study by Cummings et al. (2017) researched best practices for teaching young children exposed to traumatic events. The study was conducted with fourteen community-based service providers who had worked with young children exposed to trauma. The study included interviews from social workers and family counselors, inquiring as to what they would consider beneficial information to teachers supporting children who have experienced trauma. The research sought input for what teachers should know about young children with trauma or emotional and behavioral patterns, and how teachers might support the well-being of the child within the classroom setting. Respondents suggested that teachers need to be aware of what trauma is and how to incorporate adaptive behaviors. Adaptive behaviors concerning young children are skills that support their day-to-day functioning. Adaptive behavior skills include communication, social skills, and independent living skills. The research stated that eleven of the participants (79%) agreed that biological and developmental factors together can influence and affect early childhood outcomes. The study

showed that students with ACEs had social and academic delays as compared to standardized

testing of same-age peers. The participants of the study reported that children and their families

feel the effects of trauma. Regarding how teachers can support students with ACEs in the

classroom, their research suggested that teachers promote social and emotional communication

responses, engage in proper reactions, and resist re-traumatization (Cummings et al., 2017).

Plumb et al. (2016) researched the ways schools are beginning to adapt to students' needs

by understanding the impact of trauma on the brain, and ways to support staff and students.

School-based interventions were put in place to support students' social and emotional learning

(SEL) and positive behavioral interventions and support (PBIS). Momentous School, a

laboratory school in Dallas, Texas implemented trauma-informed strategies and began to observe

changes in students with ACEs. Trauma-sensitive schools support students coping skills, social-

emotional behaviors, and create a support system. According to Plumb et al., (2016), the

components of a trauma-sensitive school begin with training school staff on the impact of

trauma. This takes a school-wide approach. The staff learns ways to create healing relationships

among staff, caregivers, and students. and are trained on ways to support students with ACEs to

empower themselves. Lincoln High School in Walla Walla, Washington was one of the first

schools to implement this approach due to the high need for social-emotional support. The

school had 798 suspensions, 50 expulsions, and 600 police referrals in one year. During the

implementation phase, students learned ways to use PBIS and SEL to support their social-

emotional needs. After the first year of implementation of the trauma-sensitive approach, the

numbers decreased dramatically to 135 suspensions and 30 expulsions (Plumb et al., 2016).

Their results showed that when students are taught how to cope with negative effects and have

the tools to handle these situations, it will decrease the likelihood that these children will pass

ACEs down to their children (Plumb et al., 2016).

Students with ACEs may have a wide array of challenging behaviors. Findings from

successful intervention programs can inform models for trauma-informed schools. The priority is

to create a school that encompasses safety, emotions, learning, and family engagement. The

students' social-emotional needs become the priority to mitigate the trauma and toxic stress that

they have been exposed to (Blitz et al., 2016).

Classroom Environment

Mei-yung and Fung (2005) researched the impact of school facilities and how they

affected student behaviors and learning. School facilities include lighting, temperature,

ventilation, noise, aesthetics, and arrangement. Mei-yung and Fung surveyed 750 students in

Hong Kong who were initially in an old school building, but then moved into the new

Millennium School. Students were asked to report on three sections; background information on

students, how the facilities supported classroom performance, and the learning behaviors of the

students. The research questioned the students prior to moving into the new building, four

months after the students were in the new building. The results showed an improvement in

student coordination, attention, goal achievement, and student behaviors related to the

improvement of the environment.

Following their findings, Mei-yung and Fung (2005) recommended intentional choices

regarding environmental factors that might influence students' outcomes. For example, the

researchers asserted that lighting can impact student performance and productivity., and the

temperature can impact student success. They observed that having a slightly cooler school

temperature supports thermal comfort and increases student productivity and a school with good

ventilation can provide quality indoor air to support health needs. School noises can have

negative effects on students in which loud noises can decrease student productivity. School and

classroom aesthetics can support students' learning by providing appropriate furniture, soft

lighting, and pleasing paint colors. The arrangement of the classroom can support students'

needs by seating the in a "U" shape as opposed to rows, so students are able to have more

interactions and feel part of a team. When the physical classroom setup is taken into account, it

may support students' physical, academic, social and behavioral needs.

Uline and Tschannen-Moran (2008) researched the relationship between the physical and

social environment of schools and the relationship to student achievement. Eighty middle

schools in Virginia participated in the study, with a total number of 1,134 teachers responding to

the surveys. The questions were related to the quality of teacher facilities, resource support,

school climate index, and student achievement, and socioeconomic status. The teacher results

correlated with the hypothesis that school climate plays a major role in the effects of quality

school facilities on student achievement. The results linked negative teacher attitudes and

behaviors to poor quality facilities. The research suggested that the physical classroom

environment plays a role in student achievement. Uline and Tschannen-Moran (2008)

hypothesized that classrooms are aesthetically pleasing and designed for student needs can have

a greater chance of positive student-teacher relationships because the students feel safe and

comfortable. Students that feel more comfortable within the classroom have a greater chance of

engaging and participating more. Going beyond the classroom, research suggested that when

schools have aesthetically pleasing commons areas within the school, they have a higher chance

of more student, parent, and community member interactions (Uline and Tschannen-Moran,

2008).

Creating a safe classroom environment is an important aspect for both teachers and students. Holley and Steiner (2005) questioned social work students pertaining to their perspectives on characteristics of teachers, peers, and the physical classroom space that contributes to safe and unsafe spaces. They also asked for students' perspectives of the impact of safe classrooms on their learning. The students in the study were from a council on Social Work Education. Questionnaires were dispersed to one hundred twenty-one students from the ages of twenty to fifty-four. The findings showed 97% agreed that it was very important to create a safe space within the classroom; 97% also said that being in a safe classroom supported what they learned; 84% felt they learned more in a safe classroom, and overall 85% felt more personal growth in a safe classroom. The characteristics of a safe physical classroom were seating so all students were in view of each other, large room sizes, and good lighting. The research found that creating a safe classroom environment may possibly support student learning, effort, and commitment (Holley and Steiner, 2005).

The classroom environment can have triggers for students with ACEs, and teachers want to ensure that these students do not encounter any re-traumatization (Cummings et al., 2017). A study by Cummings et al. (2017) revealed that 71% of students with ACEs were triggered by darkness and loud noises, but the research suggests that teachers can control those triggers to create a supportive classroom environment to ensure their students sense of safety.

Lighting. Students with ACEs may be triggered by extreme darkness. Classroom lighting has been known to have an effect on student behaviors and learning. A recent lighting technology, Light Emitting Diodes (LEDs), is becoming widespread in popularity due to a longer lifespan and energy efficiency as compared to fluorescent lighting (Pulay and Williamson, 2018). LED lights shine with a blue spectrum tint and high efficiency, compared to fluorescent lights

that use a ballast that can cause a flicker that may affect students' behaviors and abilities (Pulay

& Williamson, 2018). A study by Pulay and Williamson (2018) researched LED versus

fluorescent lighting in regards to student engaged behaviors and whether students with

disabilities were affected by the lighting type (2018). The study took place at a U.S. university

campus with four early childhood classrooms within. The study had twenty-three students, aged

12 months to six years, with five students having developmental disabilities. The classroom used

fluorescent bulbs for two weeks and documented and collected student data with the Emergent

Academic Snapshot Observational Method. Students were scored a "1" if they were engaged

during the snapshot of the activity and a "0" if they were not. During the two-week observation

periods, data was collected following the school's established daily schedule where students

were in the classroom from: 9:30 to 10:00, 10:30 to 12:00, and 2:00 to 3:00. After the first two-

weeks the lights were switched to LEDs for the subsequent two weeks of the study. The results

found that students exhibited more engaged behaviors indicated by increased alertness, increased

arousals, and positive moods with the LED lights as compared to the fluorescent lights. Students

with disabilities, who are documented as having more sensitivities to the environment, had the

most positive change in engagement with the LEDs (Pulay & Williamson, 2018).

Winterbottom and Wilkens (2008) studied flicker, illuminance at desks, and luminance of

whiteboards. Lighting was sampled in ninety classrooms across eleven schools. The flicker from

the fluorescent lighting found in sample classrooms resulted in a higher number of students with

headaches and impaired vision. The researchers measured the number of luminaries with the

flicker of the fluorescent lights, and recommended that in the classroom with excessive daylight,

flicker, and glare fluorescent lights should be replaced with LEDs. They also recommended that

installation of window blinds would support the lighting levels in the classroom (Winterbottom

& Wilkens, 2008). Administrators reported they could consider changing their lighting to LEDs to better support their students. The research corroborated that findings from Pulay and Williamson (2018) that LEDs can support students' behaviors, health needs, attention, and focus.

A study by Morrow and Kanakri (2018) researched the impact of LED and fluorescent lighting on student behaviors. The research studied teachers' perceptions of lighting in regard to their students' positive mood, attitude, alertness, on/off task behaviors, and well-being. The study included one hundred teachers, who taught children from preschool through 12th grade. The online Qualtrics survey consisted of twenty-three questions pertaining to student attitudes, achievement, and well-being. The survey was based on pictures of classrooms with lighting. The findings suggested that teachers had mixed perceptions of the impact of lighting, as well as color and temperature on students' moods and behaviors. The majority of teachers, 81%, reported they change their classroom lighting throughout the day to impact students' moods, attention, and engagement (Morrow and Kanakri, 2018). Students with ACEs have been known to have behaviors that often overwhelm teachers within the classroom, and having a strategy of using lights to support students within the classroom may support both the students and teachers.

Acoustics. As well as lighting, the acoustic levels within the physical classroom have been known to play a role in student learning, as well. When a classroom is noisy it has been shown that students have a harder time behaving appropriately. Maag and Anderson (2006) researched the link between students with emotional and behavior disorders and how a classroom with sound-field amplification (SFA) may support their compliance. SFA is produced when two or three speakers are mounted to the wall in the back of the classroom and the teacher wears a wireless FM microphone. The six participants were from nine elementary schools within a Midwestern school district. The students were identified by the school behavior coordinator.

These students had the same four factors: a classroom with a sound field amplification sound

system (SFA), they each had an individualized education plan (IEP), an average range hearing,

and had a behavior support goal.

The six participants in the Maag and Anderson (2006) study were observed during math,

language arts, and science, and data were collected during the first twenty minutes of each class

for each student in the observation. The students were observed during three different

observational times. Data was taken on task demand and high-interest directions. The task

demands were related to the probability of something the student would not want to do, such as

read your textbook or start the test, as compared to high interest demands like get a drink or put

your coat on for recess. Baseline data showed that students took longer to follow task-demand

directions compared to high-interest tasks. After classroom use of the SFA, students

demonstrated an increase in following task directions, as well as a slight increase in response to

high-interest tasks. The slight increase in high-interest tasks shows that students with emotional

and behavior disorders would benefit from the SFA to support overall student compliance (Maag

& Anderson, 2006) When the physical classroom environment has adequate acoustics for

students the chances of following directions may increase and behaviors may decrease.

The acoustics of the classroom have been known to have an impact on student behaviors

and learning. Brannstrom et al. (2017) studied one hundred forty-nine randomly selected students

from the ages of seven to sixteen in Sweden. The students were asked questions related to

acoustics in their school. The questions pertained to ease of hearing, the impact of noise, sounds

coming from inside the classroom, situations that made it hard to hear the teacher, and sound

coming from outside the classroom. The results suggest that the lunchroom and hallways have

the least amount of students listening, and the lack of structure caused these areas to have a

higher incidence of student behaviors. Moreover, the highest annoyance of sounds was heard

during tests and reading, from teachers with adjoining rooms that often hear sounds from the

next classroom, and that girls found extra noises more bothersome than boys did. The study also

found that students with higher needs suffered more negative effects from noise and reported a

higher annoyance to noise (Brannstrom et al., 2017). Students with ACEs have been known to

have a higher sensitivity to sounds that can trigger re-traumatization.

Students react differently to sounds within the classroom. Students with ACEs may have

a history of noises that cause negative memories. Research by Astolfi et al. (2019) investigated

the effects of poor acoustics within first-grade classrooms and how it negatively affected

students and teachers. Three hundred thirty students aged six and seven were participants in the

study. They used twenty classrooms at ten elementary schools in Italy. The students were asked

questions pertaining to self-esteem, social-emotional health, relationships at home and with

friends, school enjoyment, noise levels, and quality of voice. Students responded to the

questionnaires during class, with help from the researcher and teacher as needed. The findings

showed that in classrooms with a high reverberation time there was too much echo.

Reverberation happens when sound waves continue to vibrate even after the sound has stopped

(Astolfi et al., 2019). When reverberation occurs, teachers have to raise their voice for students

to hear. This in turn causes high noise levels, and poor student listening. Poor classroom

acoustics has been associated with negative effects on student classroom behaviors (Astolfi et al.,

2019).

Students may easily become distracted by disruptive noises within their classroom. Shield

and Dockrell (2008) researched the effects of classroom and environmental noise on students'

academic performance. One hundred fifty-eight, eight-year-old students were tested in

environments during which three different noise levels were administered. Findings showed that

test scores decreased as the noises increased. Both environmental and classroom noises have

negative effects on students' academic performance, and more so for students with behavioral

needs (Shield & Dockrell 2008). These studies show that it is essential to take into consideration

acoustics in the classroom for students' learning and behavior needs.

Conclusion

The purpose of this literature review was to examine the characteristics of students with

ACEs and ways that teachers can support them within a safe school environment. Childhood

trauma can impact cognitive development, as well as social-emotional, physical, and mental

aspects of a body (Alisic, 2012). Research shows that the more exposure a child has to ACEs, the

greater their chances of life-long chronic diseases, mental illness, substance abuse, and divorce.

Common health-related concerns in children with ACEs are asthma, allergies, headaches, and

constipation/diarrhea; and as the child grows into adulthood, these ill-effects of health problems

escalate. Adults with trauma can pass down these negative effects to their children, and the cycle

of lifelong struggles may continue (Bellis et al., 2018; CDC, 2020; Felitti et al., 1998).

Teachers can support students with ACEs within the physical classroom setting by

limiting sources of re-traumatization. Studies suggest that students with ACEs can be more

sensitive to classroom lighting and acoustics. Research has shown that LED lights support

students in positive ways by a constant calming blue tint of light, as opposed to fluorescent lights

that have a constant flicker that can cause negative symptoms, such as headaches, in students.

LEDs have been researched to improve student alertness, improve mood quality, and support

student focus. More so the acoustics of the classroom have been known to trigger students with

ACEs. Research has shown that students with ACEs and other behaviors tend to lack focus and abilities when the volumes around them are too loud.

Children with ACEs have a higher risk of poor experiences in school. Research demonstrates that traumatized children may show certain negative behaviors within the classroom, and the results can overwhelm and frustrate teachers if they are not trained properly. When students with ACEs are given the proper coping skills, positive behavior supports and a support system, as well as the proper physical classroom environments of lighting and acoustics, they have a greater chance of overcoming the negative effects of trauma.

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