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Prevalence of Adverse Childhood Experiences Among Children Diagnosed with Autistic Spectrum Disorders Attending Autism Treatment Centers in Jeddah.

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Abstract— **Background:** ACEs is a major health and social issue with its burden on children themselves and their families with all its negative impact later on the individual adulthood. It was confirmed by several studies that ACEs associated with multiple negative adulthood out comes such as chronic diseases, obesity, depression, anxiety, drug abuse and also suicide. **The aim of the study** is determining ACEs prevalence among children with ASDs and addressing the factors associated with its increased prevalence, thus further preventive strategies can be implemented and lead to more support to those vulnerable group of children and their families **Methods** It is cross-sectional study was conducted among 79 participants from different governmental and private pediatric clinics from November, 2020 to April 2021 in Jeddah. Questionnaire was conducted and prevalidated questionnaire was used. We assessed health outcomes associated with the ACE scale. We were studies focusing on psychosocial/behavioral outcomes than medical outcomes. Our data set. Psychosocial/behavioral outcomes had higher odds ratio than medical outcomes with increasing ACE scale scores **Results:** About 38% of participants reported that they had seen or heard one of their parents screaming, insulting, or humiliating someone at home many times, while 40% reported that the same issue occurred sometimes. Fifty two percent sometimes witnessed someone being beaten. About 39% reported that one of their parents or family members sometimes insulted them for any reason. **Conclusions**: Exposure to multiple ACEs is associated with a wide variety of outcomes. This data suggests a benefit of screening for ACEs using this scale and highlights the need to find interventions to ameliorate their effects.

Keywords: Adverse childhood experiences, Child abuse, Neglect, Psychological abuse and sexual abuse

Introduction

Adverse childhood experiences, or ACEs, are potentially traumatic events that occur in childhood (0-17 years). For example: experiencing violence, abuse, or neglect,witnessing violence in the home or community,having a family member attempt or die by suicide.Also included are aspects of the child's environment that can undermine their sense of safety, stability, and bonding, such as growing up in a household with substance use problems,mental health problems and instability due to parental separation or household members being in jail or prison .ACEs are linked to chronic health problems, mental illness, and substance use problems in adolescence and adulthood. ACEs can also negatively impact education, job opportunities, and earning potential. However, ACEs can be prevented ACEs are common. About 61% of adults surveyed across 25 states reported they had experienced at least one type of ACE before age 18, and nearly 1 in 6 reported they had experienced four or more types of ACEs. Preventing ACEs could potentially reduce many health conditions. For

example, by preventing ACEs, up to 1.9 million heart disease cases and 21 million depression cases could have been potentially avoided.Some children are at greater risk than others. Women and several racial/ethnic minority groups were at greater risk for experiencing four or more types of ACEs.(1)

Adverse Childhood Experiences (ACEs) to be associated, in dose dependent manner, with the leading causes of illness and death in adults decades later.1 Over the subsequent 20 years, research has confirmed that trauma in early childhood, in the absence of sufficient protective caregiving, causes a frequent or prolonged stress response that is the physiological linkbetween childhood trauma and poor adult outcomes.

Schonkoff and Garner termed this “toxic stress.”(2) ACEsharm a child’s still-developing immunological system andbrain explaining the findings of poor physical, emotional,and developmental health down the road.3 For pediatricresearchers and practitioners, these data have created a2-fold challenge: How to mitigate exposure to adversity and,critically, how to ameliorate the impacts of adversity onthose exposed. In practice, this requires identification ofthose at risk and responses and tools to impact the trajectory (3).

The studies by Elmore and colleagues,(4) O’Connor,(5) andRussell(6) expand our ability to identify the many at risk.

The studies from 3 different well-resourced nations demonstratethe numerous ways in which children across theglobe are exposed to risks, both internal and external tothe family unit. They highlight that a high proportion ofchildren are exposed to social and/or intrafamilial risk factors associated with poor health and developmental outcomes,not just in adulthood, but starting in childhood.

Whereas the papers by O’Connor and Russell identifiedparental socioeconomic position as a contributing factor to early childhood multimorbidity (Russell) and that lowsocioeconomic position and minority ethnicity combinedfurther increase likelihood risk (O’Connor), the study conductedby Elmore et al demonstrates that these risks, especiallyeconomic hardship and violence exposure, areassociated with mental health concerns of anxiety anddepression in childhood. These studies contribute to ourunderstanding of which adversities, and what combinationsof adversities are the most impactful.(7)

By definition, toxic stress results from adversities experiencedwithout sufficient buffering from caregivers; thus, adversity occurring within the family system would beexpected to have the greatest impact on outcomes. Theoriginal 10 ACEs in the Felitti study included 5 types ofmaltreatment and 5 types of family dysfunction—allexposures inside the caregiving relationship. Subsequentstudies have expanded this construct to include socialrisks, such as poverty, racism, exposure to violence in thecommunity, insufficient health insurance plans, housinginsecurity, or bullying.7 Social risks, more generally, arethe conditions of the greater environment which play arole in access to health-promoting activities. However,social risks can also indirectly impact a caregiver’s abilityto buffer adversity for their children. Overall, our expandingunderstanding of the impact of ACEs and social riskson children make it imperative for health care professionalsand policy makers to understand, identify, and amelioratethese risks.

In practice, there are multiple challenges to identifying,screening for, and defining differentiated risks in children.For example, there are currently competing types of metricseven for the same "construct," such as ACEs. SomeACEs metrics assess ACEs from the original study, whileothers use an expanded construct to include social risks,such as poverty or bullying.

Some risk-assessment screeners focus on the presence orabsence of each specific ACE or social risk. Others askresponders to provide a total count of the overall numberof ACEs and risk factors that are present.

Cutoffs are also difficult to determine. The originalACEs and other studies of adult health outcomes use theexperience of 4 or more ACEs as an acceptable validatedcut point. However, studies with children suggest that alower score might be preferable since the dose-responseeffect on health outcomes may be found with fewer exposures.

Child studies identify ACEs that have occurredrelatively recently in "real time" and sometimes in veryyoung children. It could be that ACEs occurring earlier inlife have a differential impact on the rapidly developingbrain or that the short-term impact is more sensitive tofewer ACEs. More research is certainly needed.

For now, it may be most appropriate for researchersevaluating ACEs in children to include some type of sensitivityanalysis, showing the point at which cumulativeACEs were significantly associated with an outcome. Thisapproach can be seen in the study done by Elmore andCrouch in this issue, with findings indicating that, whilethey utilized 4 as a cut point for their hypothesis, 2 ormore ACEs were indeed associated with anxiety ordepression. Researchers may also want to separate those with intrafamilial childhood adversities (the original 10ACEs) from those with social risk factors or both andinclude protective factors in their analyses. These issues highlight that we need more data to inform ACE screeningas a clinical tool. There is not a validated pediatric ACEsscreener, with agreed upon cutoffs. Should a screenerinclude risks, symptoms, and strengths? What are themost effective ways for pediatricians to support familiesand address identified risks while these issues are beingelucidated.

Indeed, for the pediatric clinician and researcher, identifyingACEs or social risks is simply the first step. Thenext step is addressing them or more specifically, preventingthem or ameliorating their impact. Few pediatriciansaddress ACEs directly in their practices, eventhough they believe that doing so would positively affectchildren.(8)

Both families and practitioners have questionedwhat pediatric providers can do and how they couldaddress adversities,(9) though some studies have demonstratedeffective ways to resource families with socialrisk.(10)

Targeted case management that supports familieswith ACEs is warranted and may be effective. Anothercrucial next step, then, is to identify what training andresources would be required in order to increase the comfortof pediatricians in addressing ACEs. There needs tobe more evidence-based resources readily available forprimary care pediatricians to supplement the growingfoundation of research-based parental education materialsand the co-location of mental health specialists in primarycare pediatric practices.

It is clear that pediatric providers have a unique role insupporting the caregiving relationship which is critical inpreventing toxic stress, no matter what the adversity. Howbest to use that role to promote resilience before, during,and after exposure to adversities is being explored. Forexample, the AAP's Pediatric Approach to Trauma,Treatment, and Resilience (11) is building evidence-basedresources for primary care pediatricians to supplement thegrowing foundation of research-based mental health andparental education materials. Co-location of traumainformedmental health specialists in primary care pediatricpractices is also being explored. Anda et al remind usthat the ACEs questionnaire was designed as a researchtool for use at the population level and that there arepotential risks associated with administering it to individualsas a screening tool to predict risk and outcomes (12)

More research is needed to identify whether universalACEs screening is appropriate and to validate specifictools, and to determine management strategies that aretime and cost efficient. Therein lies the true potential ofpediatrics. Adverse childhood experiences, or ACEs, are potentially traumatic events that occur in childhood (0-17 years). For example: experiencing violence, abuse, or neglect, witnessing violence in the home or community, having a family member attempt or die by suicide .Also included are aspects of the child's environment that can undermine their sense of safety, stability, and bonding, such as growing up in a household with substance use problems, mental health problems and instability due to parental separation or household members being in jail or prison.

ACEs are linked to chronic health problems, mental illness, and substance use problems in adolescence and adulthood. ACEs can also negatively impact education, job opportunities, and earning potential. However, ACEs can be prevented ACEs are common. About 61% of adults surveyed across 25 states reported they had experienced at least one type of ACE before age 18, and nearly 1 in 6 reported they had experienced four or more types of ACEs. Preventing ACEs could potentially reduce many health conditions. For example, by preventing ACEs, up to 1.9 million heart disease cases and 21 million depression cases could have been potentially avoided.Some children are at greater risk than others. Women and several racial/ethnic minority groups were at greater risk for experiencing four or more types of ACEs.

Methodology

- **Study Area**

In Jeddah, there are six well established autism treatment centers. One in East Jeddah Hospital at MOH and the second present in King Fahad Armed Forces Hospital (KFAFH). Third one in king Khaled national guard hospital (NGH). Fourth center isSaudi association of autism (SAA). Fifth is the leading academy of autism (LAA). Sixth center isthe first autism center in Jeddah (FAC).

The study will be conducted in those autism treatment centers.

- **Study Period**:

from November, 2020 to April 2021

- **Study Population:**

All parents and guardians of all children aged 1 to 14 year old and have been diagnosed with ASD who are attending autism centers in the EJH and in KFAFH in Jeddah who are available at the period of the study.

- **Study Design:**

A Cross-sectional descriptive study.

- **Variables:**

Dependent variables: presence of ACEs.

Independent variables: demographic features,educational level of parents, financial stressor, divorce, parent death, parent in prison, domestic violence, psychiatric illness among parents and drugs at home, presence of other comorbidities and disabilities among children.

Sampling:

- **Sample size:** all parents and guardians of all children diagnosed with ASD who are attending autism treatment centers in the EJH, KFAFH, NGH, SAA, LAAand FAC from November, 2020 to April 2021

Data collection

- **Data collection tool:**

A valid questionnaire consists of parts addressing the demographic parental features, risk factors and all aspect of ACEs will be used.

- **Data Collection Technique:**

Questionnaires distributed by hand to the parents after taking their verbal consent at the waiting area.

- **Data Entry and Analysis:**

Data entered and analyzed by using SPSS version 25.

Ethical Considerations:

- Written permission from concerned authority in King Abdul-Aziz University in Jeddah, EJH, KFAFH, NGH, LAA, SAA and FAC.
- Individual consent wasbe requested for data collection.
- The authors reported no conflicts of interest.
- All information was being kept confidentially.

Justification of the Study:

To the best of our knowledge, our research was the first attempt in assessing the prevalence of ACEs among children with ASDs and its associated factors in Kingdom of Saudi Arabia.

Measures

- ACE Questionnaire- Covers ten categories of abuse, neglect, and household dysfunction.

- ACE Questionnaire enespañol- Abarcadiez categorías de abuso, negligencia y disfunción familiar.
- The Health and Social Impact of Growing Up with Adverse Childhood Experiences- A summary overview of the ACE Study and its implications written by Dr. Robert Anda, co-principal investigator of the Study.
- ACE Research Briefing- Developed by the Schuyler Center for Analysis and Advocacy, this research brief was designed for legislators and other policymakers.
- The World Health Organization (WHO) Meeting Report: Addressing Adverse Childhood Experiences to Improve Public Health-The WHO has prioritized prevention of child maltreatment and provides this ACE report to raise awareness of policymakers. The UAlbany School of Social Welfare and Prevent Child Abuse America partnership is highlighted on page 10, noting that this website serves as a way to "link policymakers, program directors, practitioners, and researchers involved in the implementation and evaluation of ACE response strategies around the world."
- Adverse Childhood Experiences (ACE) among poor older adults: Coping mechanisms and consequences- This is a proposal for a research project currently being carried out at Troy Housing Authority in Troy, NY.
- Executive Summary: ACE and Breaking the Cycle of Homelessness-The Committee on the Shelter less (COTS) provides an example of ACE-informed programming.
- PE/ACE Project: Positive Environments to overcome ACEs- Troy Housing Authority has developed the PE/ACE Project, integrating ACE research with knowledge of resiliency supports to provide Positive Encounters responding to adverse childhood experiences.
- The Lake County, CA ACE Summary Report- This is an example of one California County that worked with Ferron & consultants to engage in a community outreach campaign in which residents were surveyed and ACE awareness was raised within service delivery systems

Ethical approval:This study was approved by the Scientific Committee of faculty of medicine. To assess the knowledge, attitude and practice of self-medication among clinical years' medical students and interns, King Abdul-Aziz University (KAU), Jeddah, Saudi Arabia.

Statistical analysis

Data were analyzed performed using IBM SPSS software version 21. Significance was assessed at 5% level of significance. Chi-square test was applied to find the significance of the study. $P \leq 0.05$ was considered significant.

Results

Table 1. Sociodemographic characteristics of participants from different governmental and private pediatric clinics from November, 2020 to April 2021 (n=79)

	N	%

Age at marriage (mean±SD)		24±5	
Gender	Female	73	92.4%
	Male	6	7.6%
Nationality	Saudi	77	97.5%
	Sudan	1	1.3%
Levelofeducation	Bachelor	48	60.8%
	Secondary	30	38.0%
	Diploma	1	1.3%
Job	Housewife	3	3.8%
	Student	56	70.9%
	Governmentalemployee	19	24.1%
	Private employee	1	1.3%

The mean age of participants was 24±5 years. Out of 79 participants, 92.4% were females, 97.5% were Saudi, 60.8% had a bachelor degree, while 70.8% were students (table 1).

Table 2. Data about marriage among participants from different governmental and private pediatric clinics from November, 2020 to April 2021 (n=79)

		N	**%**
Maritalstatus	Single	56	70.9%
	Married	23	29.1%
In your first marriage, did you choose your spouse yourself?	Not applicable	56	70.9%
	No	14	17.7%
	Yes	9	11.4%
In your first marriage, if you did not choose the spouse, did you give your consent or your opinion?	Not applicable	61	77.2%
	Yes	18	22.8%
How old were you at marriage? (mean±SD)		24±5	
How old were you when having a baby? (mean±SD)		23±6	

About 71% of participants were single. Among those who are married (n=23 participant), 60.8% (n=14 participants) did not choose their spouse themselves. All those who did not

choose their spouse reported that they gave their consent or opinion. The mean age at marriage was 24±5 years, while the mean age of having a baby was 23±6 years (table 2).

Table 3. Responses of participants from different governmental and private pediatric clinics from November, 2020 to April 2021 for questions about ACE categories (n=79)

	Many times		**Sometimes**		**Once**		**Never**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Neglect								
Did your parents understand your feelings and all your worries?	42	53.2%	19	24.1%	11	13.9%	7	8.9%
Did your parents know what you do in your free time outside of school and work?	43	54.4%	19	24.1%	9	11.4%	8	10.1%
Did your parents usually not give you the amount of food you need?	2	2.5%	2	2.5%	12	15.2%	63	79.7%
Is it the habit of your parents or one of them to be drunk to the point of not being able to take care of you?	0	0.0%	1	1.3%	0	0.0%	78	98.7%
Is it your parents' habit to prevent you from going to school at times when you were available to go?	0	0.0%	6	7.6%	1	1.3%	72	91.1%
Psychological abuse								
Have you ever seen or heard one of your parents screaming, insulting, or humiliating someone at home?	30	38.0%	32	40.5%	5	6.3%	12	15.2%
Did any of your parents or family members yell at you, insult you, or humiliate you for any reason in your home?	18	22.8%	31	39.2%	11	13.9%	19	24.1%
Has one of your parents or family members threatened you or expelled you from home?	4	5.1%	9	11.4%	4	5.1%	62	78.5%
How many times have I been bullied?	13	16.5%	29	36.7%	7	8.9%	30	38.0%
Physical abuse								
Did any of your parents or any of your family members hit or wound you with something sharp, such as a knife or a sharp stick, at home?	1	1.3%	6	7.6%	10	12.7%	62	78.5%

	Many times		Sometimes		Once		Never	
	N	%	N	%	N	%	N	%
Did you ever hear or see one of your parents being hit, slapped, or kicked in your home?	6	7.6%	26	32.9%	18	22.8%	29	36.7%
Have you ever seen one of your parents stabbed with anything sharp, such as a knife or a sharp bottle, in your home?	0	0.0%	2	2.5%	1	1.3%	76	96.2%
Did any of your parents or any of your family members hit you, slapped you, or kicked you for any reason?	8	10.1%	24	30.4%	13	16.5%	34	43.0%
Did you witness someone being beaten?	10	12.7%	41	51.9%	11	13.9%	17	21.5%
Have you heard or witnessed someone being stabbed or shot?	1	1.3%	8	10.1%	2	2.5%	68	86.1%
Have you witnessed someone being threatened with a knife or weapon?	1	1.3%	4	5.1%	3	3.8%	71	89.9%
How many times have you been physically assaulted?	9	11.4%	16	20.3%	6	7.6%	48	60.8%
Have you witnessed the destruction of your house for any of the reasons mentioned?	0	0.0%	2	2.5%	0	0.0%	77	97.5%
Have you ever been beaten by soldiers, police or gang members?	1	1.3%	0	0.0%	0	0.0%	78	98.7%
Has any of your family members or friends been killed or beaten by soldiers, police or gang members?	0	0.0%	0	0.0%	2	2.5%	77	97.5%
Sexual abuse								
Has anyone harassed you or touched you in a sexual way when you did not want to?	2	2.5%	6	7.6%	4	5.1%	67	84.8%
Has anyone harassed you and made you touch inappropriate things when you didn't want to?	1	1.3%	3	3.8%	5	6.3%	70	88.6%
Has anyone tried to sexually assault you in any way?	1	1.3%	6	7.6%	5	6.3%	67	84.8%
Have you been sexually assaulted in any way?	0	0.0%	2	2.5%	5	6.3%	72	91.1%

Responses of participants from different governmental and private pediatric clinics from November, 2020 to April 2021 for questions about ACE categories were shown in table 3. About 38% of participants reported that they had seen or heard one of their parents screaming, insulting, or humiliating someone at home many times, while 40% reported that the same issue occurred sometimes. Fifty two percent sometimes witnessed someone being beaten. About 39% reported that one of their parents or family members sometimes insulted them for any reason (table 3).

Table 4. Incidence of ACE categories among participants from different governmental and private pediatric clinics from November, 2020 to April 2021 (n=79)

	N	**%**
Neglect	77	97.5%
Psychological abuse	69	87.3%
Physical abuse	71	89.9%
Sexual abuse	16	20.3%

The incidence of at least one positive response in the ACE categories: Neglect, Psychological abuse, Physical abuse, and Sexual abuse, was 97.5%, 87.3%, 89.9%, and 20.3% respectively (table 4).

Table 5. Association between ACE categories and sociodemographic characteristics among participants from different governmental and private pediatric clinics from November, 2020 to April 2021 (n=79)

	Neglect	**Psychological abuse**	**Physical abuse**	**Sexual abuse**
	%	**%**	**%**	**%**
Gender				
Female	97.3%	87.7%	90.4%	20.5%
Male	100% (p=0.681)	83.3% (p=0.759)	83.3% (p=0.581)	16.7% (p=0.820)
Levelofeducation				
Bachelor	100%	83.3%	89.6%	18.8%
Secondary	93.3%	93.3%	90.0%	23.3%
Diploma	100% (p=0.187)	100.0% (p=0.403)	100.0% (p=0.943)	0.0% (p=0.780)
Job				
Housewife	100.0%	100.0%	100.0%	0.0%
Student	96.4%	89.3%	91.1%	16.1%

	Neglect	Psychological abuse	Physical abuse	Sexual abuse
Governmental employee	100.0%	78.9%	84.2%	31.6%
Private employee	100.0%	100.0%	100.0%	100.0%
Maritalstatus	(p=0.839)	(p=0.576)	(p=0.751)	(p=0.078)
Single	96.4%	89.3%	91.1%	16.1%
Married	100.0%	82.6%	87.0%	30.4%
	(p=0.359)	(p=0.417)	(p=0.582)	(p=0.149)
In your first marriage, did you choose your spouse yourself? Not applicable				
No	96.4%	89.3%	91.1%	16.1%
	100.0%	85.7%	92.9%	50.0%
Yes	100.0%	77.8%	77.8%	0.0%
	(p=0.656)	(p=0.616)	(p=0.433)	(p=0.005)
In your first marriage, if you did not choose the spouse, did you give your consent or your opinion?				
Not applicable	96.7%	90.2%	91.8%	14.8%
Yes	100.0%	77.8%	83.3%	38.9%
	(p=0.436)	(p=0.165)	(p=0.295)	(p=0.025)
Does someone in your family have depression, mental illness, or suicidal thoughts?				
No	98%	84.3%	88.2%	23.5%
Yes	96.4%	92.9%	92.9%	14.3%
	(p=0.663)	(p=0.275)	(p=0.515)	(p=0.328)
Have you lost your parents or one of them?				
No	98.5%	86.8%	89.7%	19.1%
Yes	90.9%	90.9%	90.9%	27.3%
	(p=0.136)	(p=0.701)	(p=0.902)	(p=0.532)

When associating ACE categories to sociodemographic characteristics among participants, the only significant difference was for sexual abuse between those who chose their spouse themselves and those who did not (0% vs. 50%, $p<0.005$), and between those who did not choose their spouse but gave their consent and those who chose not applicable (38.9% vs. 14.8%, $p=0.025$) (table 5).

Discussion

Regarding marriage among participants from different governmental and private pediatric clinics from November, 2020 to April 2021 (n=79) it showed that about 71% of participants were single. Among those who are married (n=23 participant), 60.8% (n=14 participants) did not choose their spouse themselves. All those who did not choose their spouse reported that they gave their consent or opinion. The mean age at marriage was 24±5 years, while the mean age of having a baby was 23±6 years (table 2).

Regarding responses of participants from different governmental and private pediatric clinics from November, 2020 to April 2021 for questions about ACE categories (n=79)the study showed that Responses of participants from different governmental and private pediatric clinics from November, 2020 to April 2021 for questions about ACE categories were shown in table 3. About 38% of participants reported that they had seen or heard one of their parents screaming, insulting, or humiliating someone at home many times, while 40% reported that the same issue occurred sometimes. Fifty two percent sometimes witnessed someone being beaten. About 39% reported that one of their parents or family members sometimes insulted them for any reason (table 3).

regarding the incidence of ACE categories among participants from different governmental and private pediatric clinics from November, 2020 to April 2021 (n=79) it showed that The incidence of at least one positive response in the ACE categories: Neglect, Psychological abuse, Physical abuse, and Sexual abuse, was 97.5%, 87.3%, 89.9%, and 20.3% respectively (table 4).

Association between ACE categories and sociodemographic characteristics among participants from different governmental and private pediatric clinics from November, 2020 to April 2021 (n=79) When associating ACE categories to sociodemographic characteristics among participants, the only significant difference was for sexual abuse between those who chose their spouse themselves and those who did not (0% vs. 50%, $p<0.005$), and between those who did not choose their spouse but gave their consent and those who chose not applicable (38.9% vs. 14.8%, $p=0.025$) (table 5).

Omitted variablesrelated to other causative factors may be an important limitation of the results in terms of burden impact.5. Other studies conducted elsewhere in the world, this research reaffirms that as ACEs increase so do adjusted odds of poorphysical, mental and behavioral health outcomes. Since ACEs are stressful and have been found to be linked to chronic dis-eases in adulthood (13), this study helps to clarify that prevention efforts are needed in order to reduce risk factors associated withchild maltreatment in KSA. Parents, caregivers, and other relatives are primarily responsible for child maltreatment; caregiver-focused efforts are likely to be the effective mode of intervention (14). Also these results can be used to fine tune public awareness campaigns targeted atall families and encouraging positive behavior towards children (15). Also results can offerSaudi Arabian policymakers and legislators a better understanding of the benefits of child maltreatment prevention. TheSaudi Arabian Child Protection Act of November 2014 calls for initiating evidence-based prevention programs on a largerscale. Based on this national study, specific policy recommendations can be made to improve the scope, effectiveness, andcoordination of prevention services in Saudi Arabia. Policymakers and donors would benefit from support of further research onchild maltreatment prevention and its effect on chronic diseases as chronic disease is one of the major public health issuesin Saudi Arabia (16).

Subsequent ACEs studies, where this study can serve as a baseline, arekey to long term monitoring and evaluation of the effectiveness of these services. Findings from this analysis underscorethe potential benefit of providing focused preventative approaches to mitigating both the specific and cumulative burdenof health outcomes in KSA.

Conclusions:

ACEs increase so do adjusted odds of poorphysical, mental and behavioral health outcomes. Since ACEs are stressful and have been found to be linked to chronic dis-eases in adulthood, this study helps to clarify that prevention efforts are needed in order to reduce risk factors associated withchild maltreatment in KSA. First, as parents, caregivers, and other relatives are primarily responsible for child maltreatment,caregiver-focused efforts are likely to be the effective mode of intervention.Study results can be used to fine tune public awareness campaigns targeted atall families and encouraging positive behavior towards children. Further studies should done to assess prevalence and measures efficacy of preventable strategies

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