

## A study of the impact of the ARCH model of parenting on the psychosocial well-being of children and their parents during the COVID-19 pandemic

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### ABSTRACT

**Introduction:** The COVID-19 pandemic and its associated lockdowns have affected the development of children negatively. The ARCH model is a parent-administered, home-based, psychological intervention model to improve the psychosocial well-being of children and their families. The model acts as a set of guidelines and a list of activity modules for parent-child interactions that will promote and enhance the child's social skills and psychological health. **Objective:** The objective of the study was to study the effectiveness of a novel innovative psychological model and parenting strategy for promoting the psychosocial well-being of children. **Materials and Methods:** This is an open prospective single-arm study in a tertiary care hospital with pre-and post-intervention design. Patients aged 3–18 years visiting the outpatient department, admitted to the pediatric ward as well as their parents, and siblings, were enrolled in the study. Data were collected by self-reported questionnaires. The intervention was administered and 1–2 months later we checked for any changes in the psychosocial well-being scores. **Results:** Fifty participants were enrolled and eight were lost to follow-up. Statistical analysis showed an insignificant difference in the Ryff psychosocial well-being pre-intervention score (208.5±15.1) and post-intervention scores (208.4±14.8) ( $p=0.847$ ) for parents. KIDSCREEN questionnaire score showed a significant improvement in “social service and peers” subcategory, between pre-intervention score (128.83±17.18) and post-intervention score (131.29±16.60) with a Z score=2.09 ( $p<0.05$ ). KIDSCREEN questionnaire score also showed improvement in overall score in pre-intervention score (578.64±440.39) and post-intervention score (584.40±444.19) with a Z score=1.66 ( $p<0.05$ ). **Conclusion:** Our study found that while the intervention did not have a major impact on the psychosocial well-being of the parents, there was a significant difference effected on the psychosocial well-being of the children.

**Key words:** Adolescent, Child, COVID-19, Mental health, Pandemics, SARS-CoV-2

COVID-19 has impacted the lives of people all over the world. COVID-19 and its associated lockdowns have brought the world to a standstill. Children and adolescents are experiencing prolonged periods of isolation from their friends, extended family, and teachers. Children with mental health issues often rely on school routine as a coping mechanism. With the closure of schools, comes a lack of access to those facilities [1]. The response of children to an unprecedented situation such as COVID-19 depends on their prior exposure to a crisis situation, their physical and mental well-being and cultural and socioeconomic background of their parents [1,2].


Studies conducted around the world have shown behavioral and emotional distress children and adolescents struggle with during the COVID-19 pandemic. A recent study conducted

in China, showed depression, anxiety, distraction, irritability, and fear that a family member might contract the illness as a problem among children and adolescents [3]. A survey conducted by the United Nations International Children's Emergency Fund and partner organizations, showed that children and adolescents reported high levels of stress, which can affect their brain development, sometimes with irreparable long-term consequences [4].

The lockdowns are associated with home confinement, which, in turn, has an acute and lingering psychosocial impact on children due to the abrupt and drastic change in lifestyle, physical and mental excursions [5]. An important aspect of children's well-being depends on parental companionship, thus getting detached from parents, as they might contract the illness, may be associated with post-traumatic stress disorder, depression, and even suicidal tendencies [6-8].

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To deal with these challenges, few organizations such as the World Health Organization (WHO) have developed tools to help children deal with these challenges [9]. However, the question remains as to how effective these strategies really are?

Bearing in mind these challenges, the ARCH model is a proposed intervention to help children and their families cope with these unprecedented times, along with the baseline and post-intervention assessment of psychosocial well-being of children and parents to determine the effectiveness of our intervention. We conducted this study to determine the effectiveness of a proposed innovative psychological (ARCH) model and parenting strategy for promoting the psychosocial development of children.

## MATERIALS AND METHODS

This single-center pilot study was conducted in the Pediatric ward and outpatient department of a tertiary care hospital with pre- and post-intervention design. The patient enrollment and collection of pre-intervention questionnaire scores were done between March and April 2021. Patients were asked to follow intervention, after which in May and June 2021 post-intervention questionnaire scores were collected.

All patients aged 3–18 years, those visiting the outpatient department and those admitted in the pediatric ward, along with their parents and siblings who gave consent, were enrolled in the study. Those who were unable to complete the questionnaire, unable to follow-up, children with developmental disorders, and previously diagnosed psychiatric disorders were excluded from the study.

Data were collected by parent and children self-reported questionnaires. The parents were given the Ryff Psychosocial well-being scale [10,11] and children were given the KIDSCREEN-27 [12]. The parents were asked to provide informed consent on behalf of their wards as well as themselves. After this, the intervention was administered and 1 month later the same questionnaire was given to them to check for any change in the scores.

KIDSCREEN-27 assesses health-related quality of life (HRQoL) in children and adolescents. The responses of KIDSCREEN-27 were marked on a 5-point Likert Scale. The Ryff Psychosocial well-being scale assesses six dimensions: Autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. The responses to Ryff were also marked on a 5-point Likert scale to determine the HRQoL of the parents.

The intervention provided was the ARCH model of parenting. The ARCH model is a parent-administered, home-based, psychological intervention model to improve the psychosocial well-being of children, and their families. The ARCH acronym stands for: A - Attitude to Attempt, R - Resilience, C - Care and Collaboration, and H - Humor and Humility. The model acts as a set of guidelines for parent-child interactions that will promote and enhance the child's social skills and psychological health.

It emphasizes the important aspects of learning like teamwork, adaptability, discipline, analytical thinking, communication skills, self-confidence, and life skills. Research activities were selected for each category depending on how practical and simple they were to explain to parents and children. A total of 15 interventions were given (Table 1). Parents' socioeconomic status and education level were classified as per the Kuppuswamy scale [13]. Patients were defined as healthy as per the WHO definition of health [14].

## Data Analysis

The data were entered and the scores for both KIDSCREEN-27 and Ryff Psychosocial well-being scale were calculated. A variety of statistical tests were performed including the T-test and Wilcoxon Signed-Rank test which was used to compare pre and post-intervention differences. Multiple linear regressions were then run including age, gender, child's diagnosis, socioeconomic status, parents' education, parents and children's perception of the usefulness of the intervention, and their effect on the results of the intervention.

## RESULTS

We enrolled 42 participants in the study of which 23 (54.76%) were male. The most common age group enrolled in the study was from ages 8 to 18 years comprising 27 (64.28%) children. We had an equal distribution of healthy and sick children. The majority of the parents were classified as per the Kuppuswamy Scale of the level of education into high school level (30.95%), followed by middle school level (28.57%), graduate-level (21.42%), primary school level (14.28%), and illiterate (4.76%) (Table 2). Parents largely belonged to the lower middle class (47.61%), followed equally by lower (21.42%) and upper-middle (21.42%), upper-lower (9.52%), and none belonging to the upper class, according to the Kuppuswamy Scale of socioeconomic status (Table 3).

The overall Ryff psychosocial well-being score of the parents did not show a statistically significant difference in pre-intervention scores ( $208.5 \pm 15.1$ ) and post-intervention score ( $208.4 \pm 14.8$ ) ( $p=0.847$ ) (Table 4). The KIDSCREEN questionnaire score showed improvement in mean pre-intervention ( $578.64 \pm 440.39$ ) and post-intervention score ( $584.40 \pm 444.19$ ) ( $p<0.05$ ) (Table 5). KIDSCREEN questionnaire score showed a significant improvement in "social service and peers" subcategory, between mean pre-intervention ( $128.83 \pm 17.18$ ) and post-intervention scores ( $131.29 \pm 16.60$ ) ( $p<0.05$ ).

Further analysis of KIDSCREEN overall and "social service and peers" subcategory score by Wilcoxon signed-ranked test, confirmed a statistically significant difference in pre-intervention scores and post-intervention scores. KIDSCREEN overall scores had a pre-intervention median of  $823.84 \pm 440.39$ , and post-intervention median of  $843.55 \pm 440.19$  ( $Z$  score= $2.09$ ) ( $p<0.05$ ). The "social service and peers" subcategory had a pre-intervention median of  $137.94 \pm 17.18$ , and post-intervention median of  $137.94 \pm 16.60$  ( $Z$ -score= $2.09$ ) ( $p<0.05$ ) (Table 6).

Table 1: Intervention

Subcategory	Activity	Age Group (Years)	Examples	
Attempt to do things	Encouraging your child's hobbies	0–6	Puzzles, Reading books.	
		6–12	Sports, Singing, dancing, reading books.	
		12–18	Reading books, Exercising, collecting coins/stamps.	
	Assisting and facilitating routine activities.	0–6	Brushing teeth, sleep cycle, bathing, meal times.	
		6–12	Homework time, nap time, dinner time, outdoor playtime, prayer time.	
		12–18	Daily routine timetable, meeting the deadlines of leaving home and coming back.	
Resilience	Embracing their mistakes and failures.	0–6	Spilling food while eating.	
		6–12	Breaking an expensive vase while playing.	
		12–18	Getting low grades in an examination.	
	Accept and acknowledge your own mistakes and failures	0–6	Apologizing after taking away their toy.	
		6–12	Apologize if you are late to pick them up from school.	
		12–18	Apologizing after yelling at them too much.	
Teaching to cope with negative situations in a positive way.	0–6	Ask them to express how they feel by putting up a mood chart.		
	6–12	Encourage them to share and you also share positive events.		
	12–18	If he's weak at spelling instead of writing I am bad at spelling, put spelling is a challenge but I'm an artist.		
	Care	Going for regular doctor checkups.	0–6	Visiting the doctor to give your child the initial set of vaccines OR Visiting the doctor to give your child periodic vaccines.
			6–12	Visiting the doctor to get an annual checkup and consult and get clarification on the growth and development of the child.
			12–18	Making the visit during the onset of puberty Or Annual visits to a gynecologist/Urologist.
Teaching them to practice self-hygiene.		0–6	Washing your hands before eating a meal, restraining them from putting their hand in the mouth.	
		6–12	Teaching your child to cut their nails, using a handkerchief while sneezing or coughing.	
		12–18	Teach them to follow the steps "Brush, Floss, Rinse" twice for good oral hygiene, using a face wash, using clean public washrooms.	
Collaboration	Trying to Eat meals together.	0–6	Breastfeeding/feeding your child on the common dining table.	
		6–12	Breakfast and dinner.	
		12–18	Eating meals together instead of own bedrooms.	
	Encouraging household chores.	0–6	Keeping toys in place after playing, passing a plate, spoon.	
		6–12	Setting the table with spoons/forks and plates, wiping the washed dishes.	
		12-18	Taking chances in dusting/sweeping, changing tube light.	
Humility	Teaching to request instead of demanding/asking.	0–6	When the child is crying to get something, ask them to stand straight, make eye contact, and ask for it.	
		6–12	Teaching children phrases like - can you please, would you mind, if you could kindly, etc.	
		12–18	Making them understand that "No means No." and providing a valid reason for the same, taking permission to go out with friends.	
	Helping others in need.	0–6	Passing the TV remote, getting a glass, calling a person not present in the room.	
		6–12	Visiting/donating/celebrating birthdays in orphanages/old age homes.	
		12–18	Helping poor/handicapped people in the community/blind people to cross the road.	

(Contd...)

Table 1: (Continued)

Subcategory	Activity	Age Group (Years)	Examples
Humour	Providing examples of great personalities.	0–6	Cartoon characters like Robin Hood, Little Krishna, etc.
		6–12	Malala, Anne Frank, Hellen Keller, etc.
		12–18	Rabindranath Tagore, Shivaji Maharaj, Savitribai Phule, etc.
	Help facilitate empathy in them.	0–6	Respecting animals, birds.
		6–12	Empathize with a friend failing a test or when seeing a student being bullied.
		12–18	Teaching them to not be rude to beggars/hawkers.
Attitude	Engaging in playful activities that include laughter.	0–6	Playing peek-a-boo, calling them by a pet name.
		6–12	Tickling your child, taking part in fancy dress competitions.
		12–18	Dressing up as funny characters.
Attitude	Speaking positive words (affirmation)	0–6	Using kind words like, you are strong, you can do this.
		6–12	Appreciating their appearance by saying you look good today, appreciating their mind and abilities by saying you did great at the task.
		12–18	Telling them that they are kind, strong, confident, and helpful.

Table 2: Parent's level of education

Parents' Level of Education	Number (n=42)	Percentage
Illiterate	2	4.76
Primary School	6	14.28
Middle School	12	28.57
High School	13	30.95
Graduate	9	21.42

Table 3: Parent's socioeconomic status

Parents Socioeconomic Status	Number (n=42)	Percentage
Lower	9	21.42
Upper Lower	4	9.52
Lower Middle	20	47.61
Upper Middle	9	21.42
Upper	0	0

When multiple linear regression models were run it was determined that factors such as the age of the child, gender, diagnosis, child's and parental perception of effectivity of the intervention had no effect on the post-intervention KIDSCREEN-27 score.

## DISCUSSION

The COVID-19 outbreak and the resultant quarantine measures instituted have had a profound impact on the daily lives as well as the mental health of children across the world. It has caused a high level of stress among children and adolescents, especially due to the closure of schools and disruption of a healthy daily schedule. There are also additional stresses stemming from the uncertainty posed by the pandemic on their academics and ambitions, and seeing those close to them seriously ill or even pass away [15,16].

There are many ways in which this stress can be mitigated including immediate investment in psychosocial and mental health programs for children and adolescents; community-based policies and services; integration of pediatricians, school teachers, and mental health worker services, all targeted at fulfilling the specific needs of children and adolescents [16]. Other changes that could be introduced to mitigate the negative impact of the COVID-19 pandemic on mental health include the creation of mental health services, provision of specialized counseling treatment, provision of telepsychiatry services, provision of time-bound behavioral therapy to those exhibiting signs of mental disorders, and the establishment of psychological first aid [17,18].

Since these changes can only take place at a policy level, there was a lacuna observed in what could be done at home, at no additional cost, with some time commitment from parents and children.

The intervention proposed by the ARCH model was possible to do at home, at no additional cost, with a little extra time diverted toward the parent-child relationship. Our study found that while the intervention did not have a major impact on the psychosocial well-being of the parents, there was a significant difference effected on the psychosocial well-being of the children. Since this study was specifically conducted during a period where quarantine measures were instituted, it shows that these interventions can be introduced at home by parents, at a time when the children's well-being needs to be protected from external influences. Our study found that the interventions administered to the children were successful in improving their overall psychosocial well-being.

This study has some limitations. This study was a pilot study, with small sample size, conducted in a specific demographic area. A few interventions were chosen from a larger list of interventions which may skew the results.

**Table 4: Ryff psychosocial well-being pre and post-intervention scores (Dependent t-test analysis)**

S. No.	Variable	Pre-intervention (n=42)		Post-intervention (n=42)		t	p-value
		Mean	SD	Mean	SD		
1.	Autonomy	36.7	5.13	36.8	4.95	0.34	0.736
2.	Environmental Mastery	34.5	4.05	34.6	4.26	0.54	0.592
3.	Personal Growth	35.5	4.26	35.4	3.94	-0.32	0.752
4.	Positive relations with Others	33.3	3.80	33.2	3.68	-0.21	0.832
5.	Purpose in Life	34.0	5.01	33.9	4.86	-1.00	0.323
6.	Self-Acceptance	34.2	6.08	34.2	6.05	1.00	0.323
7.	PWB Total	208.5	15.1	208.4	14.8	-0.19	0.847

**Table 5: KIDSCREEN-27 pre- and post-intervention scores (Dependent t-test analysis)**

S. No.	Variable	Pre-intervention (n=42)		Post-intervention (n=42)		t	p-value
		Mean	SD	Mean	SD		
1.	Physical Well-being	171.51	24.97	173.80	22.03	1.47	0.153
2.	Psychological Well-being	219.63	19.38	222.36	17.34	1.99	0.057
3.	Autonomy and Parent relationship	247.87	28.77	249.64	27.25	0.82	0.422
4.	Social Service and Peers	130.78	14.07	133.08	14.02	2.56	<0.05
5.	School Environment	128.78	14.65	128.55	15.29	-0.20	0.839
6.	KIDSCREEN-27 Total (all T-scores)	578.64	440.39	584.40	444.19	2.07	<0.05

**Table 6: KIDSCREEN pre and post-intervention scores (Wilcoxon Signed-ranked test analysis)**

S. No.	Variable	Pre-intervention (n=42)		Post-intervention (n=42)		Z	p-value
		Median	SD	Median	SD		
1.	Social Service and Peers subcategory	137.94	17.18	137.94	16.60	2.09	<0.05
2.	KIDSCREEN-27 Total	823.84	440.39	843.55	444.19	1.66	<0.05

## CONCLUSION

There is a lack of focus on mental health, especially of children, during the COVID-19 outbreak. Many interventions have been proposed, from policy level changes, to community efforts, to changes made at the school level. However, very few of these changes can be made immediately at home by family and parents. The intervention proposed, fills the gaps left by the other proposed solutions, by being home-based and needing only a time investment by parents and children. Therefore, even small interventions at home can have an impact on the well-being of the children. However, further studies with larger sample sizes are required to see the complete effectiveness of the intervention.

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