

# Awareness and Knowledge of Parents about Precocious Puberty and Its possible complications on the affected child, Saudi Arabia, 2017

Khalid A Althobaiti<sup>(a)</sup>, Ayman A. Bakar<sup>(b)</sup>, Arwa K. Alharthi<sup>(c)</sup>, Ahmad S. Alharthi<sup>(d)</sup>.

**Abstract** Our aim was to assess knowledge and awareness of Saudi parents about precocious puberty (PCP). We conducted a cross sectional study from June - August 2017 at different region in Saudi Arabia to assess the Awareness and Knowledge of parents about PCP Using pretested questionnaire includes 15 questions about the risk factors, possible complications and diagnosis. Their responses were scored and participants were divided into two groups: 1.) poor knowledge if scores were  $\leq 5/15$  and 2.) fair/good knowledge if scores were  $\geq 5/15$ . A total of (1554) partners participated in the study. (36.7%) of participants were male while (63.3%) were females. Participants' age was mostly between 30 - 40 years, and they were mainly urban residential (78%), had bachelor's degrees or higher (61.7%). more than two third of participant had three child or more but less than five percent don't have children. Around (20.3%) knew someone with history of PCP, but only (9.7%) living with someone who had history of PCP.

The mean overall score was (4.47) with most of them in the poor knowledge category (67.7%). Participants were mostly aware about the risk factors component while they were least aware about the PCP complications -related component. Role of hereditary factors in developing of PCP was the only risk factor about which those participants were most aware. When compared to parents with moderate /good knowledge, those with poor knowledge were more likely to be unemployed or working out of medical fields, have a high school degree or less, living with someone who had PCP (all  $P < 0.0001$ ). Among the participating Saudi parents, our study showed a high prevalence of poor awareness and knowledge, mainly in those areas relating to PCP complications.

**Index Terms** – puberty, normal puberty, precocious puberty, awareness, knowledge, child health, parents education.

## INTRODUCTION

Puberty is a transitional period between childhood and adulthood where a lot of physiological and psychological changes take place. <sup>(1)</sup>

Clinically: the onset of puberty is recognized by the appearance of 2ry sexual characteristics. Particularly breast appearance in females, testicular enlargement in males and pubic / axillary hair in both. <sup>(1)</sup>

There is a lot of debate about the exact suitable age for precocious puberty (PCP) term. According to study that done in Ankarah 2010 and another study done in Brazil 2016: When the pubertal changes developed at younger age than accepted lower limit, this condition called: precocious puberty. Usually below age of (8) in girls and below age of (9) in boys. These cut points will be slightly different in black population as they consider diagnosis of PCP below age of (8) in boys and below age of (7) in girls. <sup>(2)(3)(16)</sup>.

As known: PCP can be classified into central or Gonadotropin – releasing hormone dependant and peripheral or Gonadotropin – releasing hormone independant according

to the underlying cause. <sup>(2)</sup>. Intaking ordinary vegetables, instant foods, nourishment and general life stock are accused risk factors for idiopathic central PCP. <sup>(4)</sup> Another group of risk factors called Endocrine disturbunts which used to describe some environmental factors that may lead to PCP such as: some pesticides, cleaning products, plastic products ( sandwich covering nylons ), cosmetics products, lavender perfumes, some medications ( cemetidine, antifungal . etc.) and others. <sup>(5)</sup>

PCP lead to growth acceleration then short stature of the final adult height due to acceleration of bone maturation. <sup>(6)</sup>. Also PCP might affect psychological behaviors of child especially girls who will be more distressed, isolated, embarrassed, pressured with peers or might be bullied. <sup>(7)</sup>

Using of LH marker after administration of LHRH analogue remains a gold standard test for diagnosis. <sup>(8)</sup> Uterine length  $> 3.5$ cm, uterine volume  $> 1.8$ ml are thought to be the most two specific indicators for central precocious puberty. <sup>(15)</sup>

The main aim in the treatment of PCP is to prevent the secondary sex characteristics progression, to increase final adult height, to promote psychosocial state well-being, and to treat the underlying cause if known<sup>(2)</sup>. Gonadotropin-releasing hormone analogue is usual treatment for central precocious puberty but in case of peripheral precocious puberty, we should correct the underlying cause. <sup>(9)</sup>. Despite medical and psychological consequences that may develop in children with PCP, there is no study to estimate the awareness and knowledge of parents about PCP.

Our aim in this study to assess the awareness and knowledge of parents about PCP and compare findings with baseline characters of studied group.

## METHOD

We conducted a cross sectional study from June - August 2017 at different region in Saudi Arabia to assess the Awareness and Knowledge of parents about PCP and its possible complication. Any Saudi parents above age of 20 years were invited to participate in the study through an online invitation. We excluded parents above age of 50, non-Saudi participants, and incomplete response. Study proposal was submitted to Taif University School of Medicine Ethical Committee and was approved. All completed online questioners were collected in an excel sheet and exported to a *Statistical Package for the Social Sciences*(SPSS) file.

The questionnaire includes 15 questions about the baseline characteristics that includes sociodemographic data, educational level, personal or living with someone who work in the medical field, living with someone who has PCP, and history of any chronic illness, know anyone who had precocious puberty.

To assess the PCP knowledge and awareness we used a validated questionnaire that includes 15 questions focusing on the general awareness and knowledge about PCP risk

quences/complications. The options provided were yes, no, and don't know. Each correct response was given a score of 1 and each parent was scored out of a total of 15. A score of 0-5 was considered as poor knowledge, 6-10 as fair, and 11-15 as good knowledge of PCP. Participants were divided into two groups, poor knowledge and fair/good knowledge.

## RESULT

A total of (1554) partners participated in the study and were included in the final analysis.(36.7%) of participants were male while (63.3%) were females. Participants' age was mostly between 30 - 40 years, and they were mainly urban residential (78%), had bachelor's degrees or higher (61.7%). more than two third of participant had three child or more but less than (5%) don't have children. (table1)

(80%) of the participants were from the Eastern or western region of Saudi Arabia. Less than one-third of the participants were either working or living with someone who worked in the medical field, but the majority was employed(61.8%). Around (20.3%) knew someone with history of PCP, but only (9.7%) living with someone who had history of PCP. (table1)

Regarding overall PCP knowledge assessment, the mean overall score was (4.47) with most of them in the poor PCP knowledge category (67.7%). Participants were mostly aware about the PCP risk factors component while they were least aware about the PCP

Complications-related component. Role of hereditary factors and some plastic products in developing ofPCP were the two risk factors about which those participants were most aware. (Table1-2).

When compared to parents with moderate /good knowledge, those with poor PCP knowledge were more likely to be unemployed or working in out of medical fields ( $P < 0.0001$ ), have a high school degree or less ( $P < 0.002$ , living with someone who had PCP ( $P < 0.0001$ ). (Table 1-2).

Regarding general pubertal information: (89.7%) of participants know that females mostly reach pubertal age before males, eighty percent think that normal pubertal age for males between 12-16 years and (46.9%) think that normal pubertal age for females between 11-14 years. Most of participant were aware about pubertal sign in males (49.9%) and about (30%) of participants think that the menstrual cycle is the only sign of female puberty.

a Medical Intern, College of Medicine, Taif University. Saudi Arabia

bPediatric Endocrinologist, Al-Hada Armed Forces Hospital

c Medical Intern, College of Medicine, Taif University. Saudi Arabia

d Medical Intern, College of Medicine, Taif University. Saudi Arabia

factors, diagnosis, treatment, and conse-

## Discussion

One of the major study findings is the lack of PCP -related knowledge and awareness among the participating partners despite the possible feared physiological and psychological consequences.

The total number of births in the Ministry of Health hospitals in 2014 was 267,455 according to the Saudi General Authority of Statistics <sup>(10)</sup> and the birth rate in Saudi Arabia was 18.4 births/1,000 people According to the Central Intelligence Agency <sup>(11)</sup> so there is a higher chance to have a child who will develop precocious puberty. Despite that the level of awareness is very poor comparing to high birth rate.

The findings suggest that health and education authorities need to know about the problem and try to solve it.

Most of participants in this study have a bachelors degree or even higher but they don't have enough knowledge about normal and precocious puberty. In comparing to study done in Istanbul 2015 which concludes that 84% out of girls obtained their information about puberty from their mothers <sup>(12)</sup>.

We thought the reason is absent of pubertal education programs in elementary and secondary schools in our country so the growing mothers will not have optimal pubertal information.

The parents knowledge about risk factors except role of hereditary factors, possible complications is not optimal or even enough to educate their children despite the fact that many study demonstrate these factors and complications<sup>(4,5)</sup>. Unfortunately we didn't find previous study to estimate the parent's awareness / knowledge so we cannot compare our result with it.

Some studies have evaluated the effect of health campaigns on awareness of population toward specific diseases such as study done in Philadelphia 2010 and conclude that health campaign can produce positive changes and prevent negative one <sup>(13)</sup>. Other study done in England and measured the impact of public awareness campaigns for cancer symptoms concluded that public behaviors were influenced by those campaigns. They also observed an increase in early stage cancer diagnosis. <sup>(14)</sup>

Since our study showed high prevalence of poor awareness and knowledge, we recommend national health plan to promote populations awareness and knowledge about normal puberty and precocious puberty along with risk factors, causes, complication and prevention if possible.

## Tables Table1

<b>Baseline characteristics (N=1554 )</b>	
Mean age (yrs)	30-40
Urban residence (%)	78
High school or less (%)	38.3
Bachelor degree (%)	61.8
Central region of Saudi (%)	8.4
Eastern region of Saudi (%)	5
Western region of Saudi (%)	31.4
North region of Saudi (%)	2.1
South region of Saudi (%)	53.1
Work in the medical field (%)	14.5
Living with someone who work in the medical field (%)	35.4
Unemployed (%)	38.1
Living with someone who has precocious puberty (%)	35.4
No previous personal history of any chronic illness (%)	13.2
Mean numbers of previous child	2.75
Know someone who had precocious puberty (%)	9.7
<b>Knowledge about PCP risk factors</b>	<b>answer(yes) %</b>
Precocious puberty is child puberty before normal age, did you agree with that?	39.3
Do you think that the female normally reach pubertal age before male?	89.7
Do you think that obese child have a higher chance to develop precocious puberty?	38.8
Do you think that black race child have a higher chance to develop precocious puberty?	18
Do you think that hereditary factors play a role for developing precocious puberty	72.5
Do you think that seasonal fruits might be a risk factor for developing precocious puberty?	7.3
Do you think that nylon cover for sandwich might be a risk factor for developing precocious puberty?	9.4
Did you think that preterm child have a higher chance to develop precocious puberty?	7.1
Do you think that plastic products might be a risk factor for developing precocious puberty?	16.6
Do you think that Lavender perfumes might be a risk factor for developing precocious puberty?	5.3
Do you think that some cosmetics cream might be a risk factor for developing precocious puberty?	38.5
Do you think that some medications such as (antifungal – anti histamine) might be a risk factor for developing precocious puberty?	17.5

<b>Knowledge about PCP complications</b>	
Do you think that child with precocious puberty will have short stature in the future?	21.1
Do you think that female child with precocious puberty will have a risk for breast cancer in the future?	15.5
<b>Knowledge about PCP treatment</b>	
People who choose medical treatment	24.6
People who choose surgical treatment	0.3
People who choose medical and surgical together	22.3
People who choose don't know	52.8
<b>PCP knowledge</b>	
Mean of the total score out of 15 points	4.47
Poor knowledge (%) ( 5 or less)	67.7
Moderate knowledge (%) ( 6-10)	28.9
Good knowledge (%) (11-15)	1.5

**Table2**

<b>Variables</b>	<b>Poor knowledge</b>	<b>Fair/Good knowledge</b>	<b>P value</b>
Number of participants (%)	69.4	30.6	0.0001
Urban residence (%)	77.9	78	0.96
High school or less (%)	40.9	32.4	0.002
Bachelor degree (%)	59.1	67.6	
Central region of Saudi (%)	8.1	8.9	0.053
Eastern region of Saudi (%)	6.2	2.03	
Western region of Saudi (%)	31.9	29.7	
North region of Saudi (%)	1.8	3	
South region of Saudi (%)	52	56.1	
Work in the medical field (%)	11.67	31.2	0.0001
Unemployed (%)	39.2	35.8	0.0001
Living with someone who has precocious puberty (%)	32.3	19	0.0001
No previous personal history of any chronic illness (%)	13.45	12.7	0.38
Know someone who had precocious puberty (%)	10	8.9	0.5

**Table2**

<b>Variables</b>	<b>Poor knowledge</b>	<b>Fair/Good knowledge</b>	<b>P value</b>
<b>Knowledge about PCP risk factors</b>			
Precocious puberty is child puberty before normal age, did you agree with that?	(29)	(63.6)	0.0001***
Do you think that the female normally reaches pubertal age before male?	(87.9)	(96.2)	0.002**
Do you think that obese child has a higher chance to develop precocious puberty?	(30.9)	(61.4)	0.0001***
Do you think that black race child has a higher chance to develop precocious puberty?	(10.4)	(35.8)	0.0001***
Do you think that hereditary factors play a role for developing precocious puberty	(6.6)	(88.6)	0.0001***

Do you think that seasonal fruits might be a risk factor for developing precocious puberty?	(2.7)	85 (18)	0.0001***
Do you think that nylon cover for sandwich might be a risk factor for developing precocious puberty?	(2.4)	(25.6)	0.0001***
Did you think that pre-term child has a higher chance to develop precocious puberty?	(2.9)	(16.7)	0.0001***
Do you think that plastic products might be a risk factor for developing precocious puberty?	(5.5)	(42.4)	0.0001***
Do you think that Lavender perfumes might be a risk factor for developing precocious puberty?	(1.12)	(14.8)	0.0001***
Do you think that some cosmetics cream might be a risk factor for developing precocious puberty?	(23.4)	(73.7)	0.0001***
Do you think that some medications such as (antifungal – anti histamine) might be a risk factor for developing precocious puberty?	(6.4)	(43)	0.0001***

**Knowledge about PCP complication**

Do you think that child with precocious puberty will have short stature in the future?	(12.3)	(41.7)	0.0001***
Do you think that female child with precocious puberty will have a risk for breast cancer in the future?	(4.2)	(40.5)	0.0001***

**Knowledge about PCP treatment**

People who choose medical treatment	(19.9)	(35.8)	0.0001***
People who choose surgical treatment	(0.4)	(0.2)	
People who choose medical and surgical treatment	(15.4)	(38.35)	

**References**

- GuglielmoBeccut and Lucia Ghizzoni. Normal and abnormal puberty .De Groot LJ, Chrousos G, Dungan K, et al., editors.South Dartmouth (MA): MDText.com, Inc.; 2000-.
- MerihBerberoğlu . Precocious Puberty and Normal Variant Puberty: Definition, etiology, diagnosis and current management .J Clin Res PediatrEndocrinol . 2009 Jun; 1(4): 164–74.
- Ana Claudia Latronico, ViniciusNahime Brito, Jean-Claude Carrel. Causes, diagnosis, and treatment of central precocious puberty . THE LANCET Diabetes &Endocrinology . 2016 March ; 4(3): 265-74 .
- 4-Ruimin Chen, ChunyanCai, Zhijian Hu, Xianquan Lin, Yunfei Li, Ying Zhang et al . Risk factors for idiopathic central precocious puberty of girls in Fujian province .Int J PediatrEndocrinol . 2015; 2015(Suppl 1): P94.
- SamimÖzenand ŞükranDarcan . Effects of Environmental Endocrine Disruptors on Pubertal Development . J Clin Res PediatrEndocrinol. 2011 Mar; 3(1): 1–6.
- Carel JC<sup>1</sup>, Lahlou N, Roger M, Chaussain JL. Precocious puberty and statural growth. Hum Reprod Update. 2004 Mar-Apr;10(2):135-47.
- Tremblay L, Frigon JY. Precocious puberty in adolescent girls: a biomarker of later psychosocial adjustment problems. Child Psychiatry Hum Dev. 2006 Fall;36(1):73-94.
- Soriano-Guillén L<sup>1</sup>, Argente J. [Central precocious puberty: epidemiology, etiology, diagnosis and treatment]. AnPediatr (Barc). 2011 May;74(5):336.e1-336.e13. doi: 10.1016/j.anpedi.2010.11.003. Epub 2011 Feb 18.
- Fuqua JS. Treatment and outcomes of precocious puberty: an update. J ClinEndocrinolMetab. 2013 Jun;98(6):2198-207. doi: 10.1210/jc.2013-1024. Epub 2013 Mar 20.
- ( <http://www.stats.gov.sa/ar/4655>)
- <https://www.cia.gov/library/publications/the-world-factbook/geos/sa.html>)
- Pınar İşgüven,<sup>1</sup> Göze Yörük,<sup>2</sup> and Filiz Mine Çizmecioglu<sup>3</sup> . Educational Needs of Adolescents Regarding Normal Puberty and Menstrual Patterns .J Clin Res PediatrEndocrinol . 2015 Dec; 7(4): 312–22.
- Prof. Melanie A. Wakefield, Prof. Barbara Loken, and Prof. Robert C. Hornik. Use of mass media campaigns to change health behavior .Lancet. 2010 Oct 9; 376(9748): 1261–71.
- J Moffat,<sup>1,2</sup> A Bentley,<sup>1</sup> L Ironmonger,<sup>1</sup> A Boughey,<sup>1</sup> G Radford,<sup>2</sup> and S Duffy<sup>3</sup> . The impact of national cancer awareness campaigns for bowel and lung cancer symptoms on sociodemographic inequalities in immediate key symptom awareness and GP attendances .Br J Cancer. 2015 Mar 31; 112(Suppl 1): S14–S21.
- Manoj Kumar, SatinathMukhopadhyay, and Deep Dutta. Challenges and controversies in diagnosis and management of gonadotropin dependent precocious puberty: An Indian perspective. Indian J EndocrinolMetab . 2015 Mar-Apr; 19(2): 228–235.
- Sperling pediatric endocrinology , 4<sup>th</sup> edition , 2014.