e-ISSN: 2746-4474
DOI=10.20473/iabj.v2i2.124

Indonesian Andrology and Biomedical Journal

Literature review

Adult Male's Penile Size Measurement and Its Affecting Factors

Mikhael San Putra Wijanarko[1]*, Cathelin Stella[2], Gian Oktavianto[3]

[1] Alumni of Faculty of Medicine, Universitas Kristen Krida Wacana, Jakarta, Indonesia
[2] Mitra Keluarga Kelapa Gading Hospital, Jakarta, Indonesia
[3] Hermina Podomoro Hospital, Jakarta, Indonesia

OPEN ACCESS

ARTICLE INFO

Received: August 12, 2021
Accepted: November 04, 2021
Published: December 10, 2021

*) Corresponding author:
E-mail:
mikhael.san@gmail.com

Keywords:
Erect Penile Length
Flaccid Penile Length
Human & Health
Mean Penile Length
Stretched Penile Length

Abstract

Background: *In the general population, it is estimated that 91% of adult males perceive their penile size to be smaller than average. Concern about penile size can affect one's self-esteem, which then affects its sexual function, satisfaction, as well as physical and mental health. Therefore, accurate penile measurements are needed for clinical and academic purposes.*
Reviews: *Measurement of penile size can be performed in an erect, stretched, even flaccid condition. However, from various researches, there is no standardization of such a measurement method. Various researches have carried out average penile measurement but many factors can affect these results such as race, genital conditions, systemic diseases, surgical procedures, and aging.*
Summary: *There is no internationally agreed way of measuring an adult male's penis and many other factors can make the results of penile measurements vary. Proper measurement and finding out the right average of penile size in adult male with regard to other affecting factors, will be indispensable for both clinical and academic purposes.*

Cite this as: Wijanarko, M.S.P., Stella, C., & Oktavianto, G. (2021). Adult Male's Penile Size Measurement and Its Affecting Factors. *Indonesian Andrology and Biomedical Journal*, 2(2):55-62. https://doi.org/10.20473/iabj.v2i2.124

1. Introduction

As ancient as the humankind existence, we learned that men have assumed that a symbol of masculinity, sexual satisfaction, and better reproductive abilities is to have a large penile size.[1,2] Likewise we also learned that the stigma of having small penile size is a shame.[3] In the general population, it is estimated that 91% of adult males perceive their penile size to be smaller than average.[4] This dissatisfaction is also affected by men's expectations of the larger penile size, which are favored by women.[5] The concern about penile size can affect one's self-esteem, sexual function and satisfaction, and also physical and mental health.[6,7] Accurate penile measurements are needed for clinical and academic purposes such as for diagnosing micropenis, genital anatomic malformations, determining situations that require penile enlargement surgery, evaluating the results of medical and surgical interventions, experimental research, education on normal penile measurement, and making condoms that are suitable for the right size.[8,9]

The aim of writing this literature review article is to find out how to measure penile size, the average measurement of adult male penile from recent researches, and various conditions that can affect adult male's penis size.

2. Review

Penile Growth

After the first trimester of pregnancy, the production of gonadotropins from the fetal hypothalamic-pituitary axis is required for penile enlargement.[9] Penile growth requires hormones and androgen receptors that function properly.[10] At the end of gestation, the average penile length is 2cm.[9] After the infant was born, penile growth does not require a surge of hormones but is the result of normal growth.[9] Various researches have shown that in pre-puberty, the average penile measurement is 6cm.[11,12]

Penile growth from puberty to adulthood is affected by activation of the hypothalamic-pituitary-gonadal axis that stimulates testosterone production in the testes.[9,13] Rapid penile enlargement occurs at the beginning and during the puberty.[14–16] From a research in Brazil, we found out that the average penile length at 12 years old is at 8.6 cm, 13 years old is at 10.1 cm, and 14 years old is at 11.5 cm.[16] On another research done by Marshall and Tanner, the penile length measured at the age of 12.5 years is at 12.5-14.5 cm and at the age of 14.5 years, it is measured at 12.5-16.5 cm.[16] On another research conducted by Schonfeld and Beebe and a research in Japan found the average penile length at the age of 14 was 9.8 cm and 8.3 cm respectively.[16] In 2012, Soydan, et al. found the average length of the penis at the age of 13 years is at 10.56 cm, age of 14 years is at 11.26 cm, and age of 15 years is at 11.82 cm.[16]

In the adult male's penis, androgen receptors are no longer expressed, thus, the reduction in penile size in the event of androgen deficiency after puberty is minimal.[17] It is also not possible to increase the size of the penis by giving testosterone to men.[17]

Measuring The Penile Size

A rigid straight ruler is usually used to measure the length of the penis, especially for erect penile length (EPL) and stretched penile length (SPL).[18–20] Study from Omer, et al. found that the most commonly used tool for measuring the penile is using a semi-rigid ruler.[21] The difficulty of following the curvature of the penis has led other researchers to recommend the use of a flexible tape measure that does not stretch to measure the flaccid penile length (FPL) and EPL.[19] Most of the measurements in these literatures are taken at room temperature and in a standing or supine position.[18,19,22] Measurement disturbances can occur due to vasoconstriction of the penis due to a surge of adrenaline because of unpleasant examination conditions.[19] Another affecting factors are patient's anxiety, level of arousal at the time of measurement, and recent ejaculation.[21,22] Further, to obtain good measurement results, measurements can be made twice or the average of three measurements.[19]

SPL measurement is conducted by measuring the length of the flaccid penis that is maximally stretched, parallel to the floor (forming an angle of 90^o with the body), measured on the dorsal part of the penis, from the symphysis pubis to the tip of the penile glans.[8,9,19,21] There are lots of inter-individual variation in penile length when the penis is not stretched.[12] Measurements using the pubo-penile skin junction to the tip of the penile glans (skin-to-tip) are widely used in research, although measurements from the pubic bone to the tip of the glans penis (bone-to-tip) are also

used.[21,23] Research conducted by Habous, et al. showed that skin-to-tip measurements are less accurate than bone-to-tip measurements because they are affected by body mass index.[23] The SPL measurement can estimate the penile size when erect (±10%) and can be used if it is not possible to measure the EPL.[9,19,20] Several studies found a significant difference ranging from 1-3.75 cm until 5-6 cm between SPL and EPL.[8,24] The bias in SPL results is due to the need for a tension force of 450g to achieve full penile erection length, whereas clinicians usually stretch less than this value.[19,25] SPL will also be different in young and old men due to differences in biomechanics.[8]

The rigid phase in penile erection is used to measure EPL.[19] To obtain maximum erection measurement, personal stimulation can be conducted by the patient (visual or manual) if there is no erectile dysfunction, or by giving a phosphodiesterase type 5 inhibitor, or by giving intra-cavernous injection with prostaglandin E1 or papaverine-phentolamine.[19,20] A limitation while measuring EPL in research is the difficulty in obtaining and maintaining an appropriate erection.[26] The dorsal penile skin-to-tip linear distance was used to measure FPL.[20,27] The pubic adipose pad should be pressed against the bone for bone-to-tip measurements.[18,21] EPL prediction is not effective while using FPL measurement.[19,21]

In measuring the penile circumference and diameter of penile glans, a caliper or measuring tape can be used during this process.[20,28] While most researchers use the center of the corpus penile to measure the circumference of the penis, other researchers have uses the base of the penis as well as the corona.[20,28] Several other ways to measure the penile volume are using ultrasonography, Doppler ultrasound, radioisotope, three-dimensional photography, calculating the stretching function of the corpus cavernosum, dispensability of the tunica, and intra-cavernous pressure, as well as magnetic resonance imaging.[19,22] Until now, the measurement of penile size has not had universal parameters and standardization, so it can lead to non-standardized and inaccurate measurements.[21,27]

Adult Male's Penile Measurement

In various studies, the measurement of FPL and SPL are associated with the ability of the penis to stretch, although other studies did not find such correlations.[20] This stretching capacity is reported to decrease with age, some of the studies disagreed with the result.[20] The study found out that larger flaccid penile measurement have lower elasticity compared to smaller flaccid measurement.[10] Further, penis with shorter FPL do not necessarily have a shorter EPL than those with a longer FPL.[10] There is a term that has developed since 1966, for adult males with flaccid penises that appear larger, but when erections, penile size does not increase, widely called "shower", while adult males with penises during erections show an increase in length and width, more commonly referred as "growers".[29] A study conducted by Yafi, et al., said that men are referred to as "growers" when the FPL increases by ≥4 cm during erection.[29]

A data set from 1948-2011 in various countries (United States, Nigeria, Israel, Italy, Turkey, Greece, Jordan, Iran, and India) on 12.257 participants (17-83 years) obtained an average FPL of 8.6 4cm, SPL of 12.87 cm, and penile circumference of 9.11 cm.[8] A systematic review conducted by Veale, et al., found that the average FPL was 9.16 cm, the SPL was 13.24 cm, and the EPL was 13.12c m, while the flaccid penile circumference (FPC) was 9.31 cm and the erect penile circumference (EPC) was 11.66 cm.(25) FPL < 6 cm, SPL < 9.5 cm, or penile length below two standard deviations (SD) occurred in 2.28-5% of the male population, while those >20 cm were found to be as much as 1%.[25,30] Various studies on penile measurement have many factors that can influence the results, such as variations in measurement methods, race and ethnicity, age, and other health conditions.[8,18,27]

Table 1. Mean Penile Length in Various Studies in 2011-2018

Researchers	Year of Publication	Country	Participants	Age (Year)	Mean FPL (cm)	Mean SPL (cm)	Mean EPL (cm)
Aslan, et al.[31]	2011	Turkey	1132	19-30	9.3	13.7	-
Choi, et al.[10]	2011	Korea	144	21-89	7.7	11.7	-
Khan, et al.[24]	2011	England	609	16-90	8.7[a], 10.2[b]	14.3	-
Nasar, et al.[11]	2011	Egypt	1000	21-45	8.37	13.77	-
Soylemez, et al.[8]	2012	Turkey	2276	18-39	8.95	13.98	-
Chrouser, et al.[32]	2013	Tanzania	93	19-47	-	11.5	-
Chen, et al.[20]	2014	China	5196	18-60	6.5	12.9	-
			311		6.6	12.9	12.9
Habous, et al.[33]	2015	Saudi Arabia	778	20-82	-	-	12.53[a] 14.34[b]
Shalaby, et al.[27]	2015	Egypt	2000	21-40	-	13.84	-
Park, et al.[34]	2016	Korea	248	20-29	7.39	-	13.53
Salama[35]	2016	Egypt	239	17-55	7.4[a], 9.7[b]	-	11.8[a], 14.2[b]
			59	22-34	8.05[a], 10.02[b]		13[a], 15[b]
Yuruk, et al.[36]	2016	Turkey	49	35.8 (mean)	-	12.9	-
			50	38.8 (mean)		14.61	
Hussein, et al.[18]	2017	Iraq	223	20-77	9.8	12.6	-
Habous, et al.[23]	2018	Middle East	201	20-75		9.72[a], 11.69[b]	12.36[a], 14.3[b]
Salama[2]	2018	Egypt	105	24-68	7.81[a], 12.88[b]	-	10[a], 15.04[b]
			105	28-70	7.46[a], 11.8[b]		9.66[a], 13.96[b]
			105	25-68	7.51[a], 12.77[b]		9.61[a], 14.88[b]
Yafi, et al.[29]	2018	USA	73	47.5 (mean)	10.1	15.7	15.5
			205	55.9 (mean)	10	13.4	13.1

FPL, *flaccid penile length*; SPL, *stretched penile length*; EPL, *erect penile length.*
[a]Measurement *skin-to-tip.*
[b]Measurement *bone-to-tip*

Table 2. Mean Penile Circumference in Various Studies in 2011-2018

Researchers	Year of Publication	Country	Participants	Age (Year)	Mean FPC (cm)	Mean EPC (cm)
Nasar, et al.[11]	2011	Egypt	1000	21-45	10.48	-
Soylemez, et al.[8]	2012	Turkey	2276	18-39	8.89	-
Chrouser, et al.[32]	2013	Tanzania	93	19-47	8.7	-
Chen, et al.[20]	2014	China	5196	18-60	8	-
			311		8	10.5
Habous, et al.[33]	2015	Saudi Arabia	778	20-82	-	11.5
Salama[35]	2016	Egypt	239	17-55	8.7	11.2
			59	22-34		11.8
Habous, et al.[23]	2018	Middle East	201	20-75	9.35	11.61
Salama[2]	2018	Egypt	105	24-68	9.14	11.92
			105	28-70	8.84	11.56
			105	25-68	9.11	12.06

FPC, *flaccid penile circumference*; EPC, *erect penile circumference*.

Conditions That Can Affect Adult Male's Penile Size

There are several conditions or main factors that can affect an adult male's penile size. Racial and ethnic factors are thought to influence the differences in penile size, although not all studies agree with that.[10,16,18] But there is a significant variation in SPL between ethnicities, where the Caucasian and Negroid ethnicities have longer SPLs compared to East Asian.[10,37] Genetic differences are thought to be related to penile size variations, while intrauterine conditions cause differences in penile size within one ethnic group.[10] A study in China found no difference in SPL between 22 ethnicities in China, but there were differences in FPL and penile circumference between ethnicities.[20]

Aging will result in a decrease of penile tissue quality, which there is a decrease in smooth muscle cells and elastin fibers in the corpus cavernosum (remodeling), the extensibility, and elasticity of the tunica albuginea are also reduced, so that the size of the penis will change.[8,38] A study found the penile ability to stretch from flaccid to erect is more significant in young men.[19] A study in the United Kingdom found no reduction in penile measurement with age, while a study in Baghdad discovered that penile length increases after the age of 55.[18] The aging process will make the EPL smaller and larger in flaccid conditions.[23,38] So, for older men, the FPL can be longer than younger men, but the EPL doesn't seem to make a difference.[19,33]

Another factor that could affect the measurement is the circumcision. Circumcision is a surgical procedure to remove all or part of the penis foreskin.[39,40] Research on children in Brazil with ultrasound examination found no significant difference in penile length in those who were circumcised and those who did not.[8] But a study in Korea found that EPL is shorter in a population that is circumcised at birth.[34] Some of the suspected causes are bleeding that can cause damage to the normal structure of the penis as well as the loss of loose parts of the penile skin that cover and protect the upper part of the penis (containing nerves, blood vessels, and a small part of the muscles).[34]

Abnormalities in the penis can also cause changes in penile size, such as Peyronie's disease (PD), which is characterized by the formation of palpable penile plaque and penile deformity due to a fibrosis disease occurring in the tunica albuginea.[41] Loss of focal elasticity in tunica albuginea results in non-uniform tunica expansion during erection, causing deformity in the penis, including deformity of the penile curvature.[41]

Non-curvature deformity in PD is caused by a reduction in overall penile length due to loss of longitudinal tunica elasticity, while EPC can also be focally or globally reduced, especially when elasticity loss occurs in the radial part of the tunica.[41,42] In 7.3-90% of patients undergoing surgical procedures for PD treatment, undergo shortening of penile measurement up to 5cm.[43]

Congenital abnormalities, priapism with corporal fibrosis, and severe hypospadias can also affect penile size.[44–46] Testosterone levels are thought to be related to penile size, but another study found men who had potential testicular malfunctions (anorchia, maldescended testes, varicocele, and infertility) still had normal penile size.[5,24] Men with erectile dysfunction have a normal penile size, although several other studies have found smaller penile dimensions.[2,47]

Systemic diseases such as diabetes mellitus (DM) can also affect the penile size, where tissues in the penile corpus and tunica (smooth muscles, extracellular matrix, elastin fibers, and collagen) can undergo pathological processes.[2] Increased collagen production and fibrosis due to extracellular matrix changes and increased transforming growth factor-B1 due to hyperglycemia may cause penile extensibility disorders.[2] Some studies have found the penile measurement of DM patients is smaller than non-DM patients.[2] As for smoking habits, EPL in non-smoking men are longer than smokers, is thought to be caused by reduced penile elasticity.[2] Patients with systemic lupus erythematosus (SLE) associated with antiphospholipid syndrome accompanied by erectile dysfunction or who have experienced arterial thrombosis previously, have a shorter penile circumference.[48,49] Previous studies have also found a reduction in penile dimensions in the absence of erectile disorders in SLE patients.[50]

Prostate cancer treated with radical prostatectomy, radiation, and/or androgen suppression therapy can also reduce the penile size (penile hypoplasia).[44,46] Some studies show a 1.1-4 cm reduction in penile measurement in 15-71% of patients, although other studies show no change in penile measurement after radical prostatectomy.[43,51,52] A reduction in penile length is thought to be due to the removal of the prostatic urethra (shortening of the urethra).[22,52] In the initial postoperative period (most noticeable within 3-6 months), cavernous nerve injury is suspected to cause smooth muscle contractions and hypertonic penile retraction due to excessive activity of the sympathetic.[51] This injury condition will cause apoptosis in smooth muscles, reduced elastin fibers, increased collagen fibers, and fibrosis (decrease in elasticity).[51,52] A reduction in penile length may also occur as a result of other medical procedures, such as hypospadias surgery, urethroplasty, and implantation of penile prosthesis.[2,22,45]

4. Conclusion

From various studies covering adult male's penile size, the results vary widely. There is no internationally agreed way of measuring an adult male's penis and many other factors can make the results of penile measurements vary. Therefore, it is necessary to standardize measurement techniques to get the right average size of the man's penis. Proper measurement and the right average of penile measurement in adult males, concerning other affecting factors, will be indispensable for both clinical and academic purposes.

Conflict of Interest

The author states there is no conflict of interest

References

1. Yang DY, Jeong HC, Ahn ST, Bae WJ, Moon DG, Kim SW, et al. A comparison between hyaluronic acid and polylactic acid filler injections for temporary penile augmentation in patients with small penis syndrome: a multicenter, patient/evaluator-blind, comparative, randomized Trial. The Journal of Sexual Medicine. 2020;17(1):133–41.
2. Salama N. Penile dimensions of diabetic and nondiabetic men with erectile dysfunction: a case–control study. Am J Mens Health. 2018;12(3):514–23.
3. Pratama PKD, Sanjaya IPG. Teknik two step-cutaneous plasty shaft Penis dengan scrotal skin pada kasus parafinoma penis: laporan kasus. Intisari Sains Medis [Internet]. 2019 [cited 2021 Apr 3];10(2). Available from: https://isainsmedis.id/index.php/ism/article/view/408
4. Hehemann MC, Towe M, Huynh LM, El-Khatib FM, Yafi FA. Penile girth enlargement strategies: what's the evidence? Sexual Medicine Reviews. 2019;7(3):535–47.
5. Prause N, Park J, Leung S, Miller G. Women's preferences for penis size: a new research method using selection among 3D models. Hoffmann H, editor. PLoS ONE. 2015;10(9):1–17.
6. Johnston L, McLellan T, McKinlay A. (Perceived) size really does matter: Male dissatisfaction with penis size. Psychology of Men & Masculinity. 2014;15(2):225–8.

7. Dellis AE, Arkoumanis T, Kyprianou C, Papatsoris AG. Paraffinoma, siliconoma and Co: disastrous consequences of failed penile augmentation-A single-centre successful surgical management of a challenging entity. Andrologia. 2018;50(10):1–7.
8. Söylemez H, Atar M, Sancaktutar AA, Penbegül N, Bozkurt Y, Önem K. Relationship between penile size and somatometric parameters in 2276 healthy young men. Int J Impot Res. 2012;24(3):126–9.
9. Campbell J, Gillis J. A review of penile elongation surgery. Transl Androl Urol. 2017;6(1):69–78.
10. Choi IH, Kim KH, Jung H, Yoon SJ, Kim SW, Kim TB. Second to fourth digit ratio: a predictor of adult penile length. Asian J Androl. 2011;13(5):710–4.
11. Nasar TA, Gadalla A, Zeidan A, El Batrawy M, Ghanem H. Relationship between penile size and body measurements: Human Andrology. 2011;1(2):48–50.
12. Kirana P-S, Tripodi F, Reisman Y, Porst H, editors. The EFS and ESSM syllabus of clinical sexology. 1st ed. Amsterdam: EFS, ESSM, Medix; 2013. 175,195-205.
13. Sherwood L. Human physiology: from cells to systems. 9th ed. United States of America: Cengage Learning; 2016. 720,721,725.
14. Park S, Chung JM, Kang DI, Ryu DS, Cho WY, Lee SD. The change of stretched penile length and anthropometric data in korean children aged 0–14 Years: comparative study of last 25 Years. J Korean Med Sci. 2016;31(10):1631–4.
15. Han JH, Lee JP, Lee JS, Song SH, Kim KS. Fate of the micropenis and constitutional small penis: do they grow to normalcy in puberty? Journal of Pediatric Urology. 2019;15(5):526.e1-526.e6.
16. Soydan H, Akyol İ, Ates F, Yilmaz O, Dursun F, Baykal K. Cross-sectional analysis of penile length in males 13 to 15 years old according to pubertal development stages. Journal of Urology. 2012;188(4):1319–23.
17. Weinbauer GF, Luetjens CM, Simoni M, Nieschlag E. Physiology of testicular function. In: Andrology : male reproductive health and dysfunction. 3rd ed. London: Springer; 2010. p. 50.
18. Hussein NS, Abid AF, Alnuaimi AS. Reference range of flaccid and stretched penile lengths of adult males in Baghdad: A cross-sectional study. Arab Journal of Urology. 2017;15(1):68–73.
19. Greenstein A, Dekalo S, Chen J. Penile size in adult men—recommendations for clinical and research measurements. Int J Impot Res. 2020;32(2):153–8.
20. Chen XB, Li RX, Yang HN, Dai JC. A comprehensive, prospective study of penile dimensions in Chinese men of multiple ethnicities. Int J Impot Res. 2014;26(5):172–6.
21. Cakir OO, Pozzi E, Castiglione F, Alnajjar HM, Salonia A, Muneer A. Penile Length Measurement: Methodological Challenges and Recommendations, a Systematic Review. The Journal of Sexual Medicine. 2021;18(3):433–9.
22. Davoudzadeh EP, Davoudzadeh NP, Margolin E, Stahl PJ, Stember DS. Penile length: measurement technique and applications. Sexual Medicine Reviews. 2018;6(2):261–71.
23. Habous M, Muir G, Soliman T, Farag M, Williamson B, Binsaleh S, et al. Outcomes of variation in technique and variation in accuracy of measurement in penile length measurement. Int J Impot Res. 2018;30(1):21–6.
24. Khan S, Somani B, Lam W, Donat R. Establishing a reference range for penile length in Caucasian British men: a prospective study of 609 men. BJU International. 2011;109(5):740–4.
25. Veale D, Miles S, Bramley S, Muir G, Hodsoll J. Am I normal? A systematic review and construction of nomograms for flaccid and erect penis length and circumference in up to 15 521 men: Nomograms for flaccid/erect penis length and circumference. BJU Int. 2015;115(6):978–86.
26. Herbenick D, Reece M, Schick V, Sanders SA. Erect penile length and circumference dimensions of 1,661 sexually active men in the United States. The Journal of Sexual Medicine. 2013;11(1):93–101.
27. Shalaby ME, Almohsen AE-RM, El Shahid AR, Abd Al-Sameaa MT, Mostafa T. Penile length-somatometric parameters relationship in healthy Egyptian men. Andrologia. 2015;47(4):402–6.
28. Ghanem H, Glina S, Assalian P, Buvat J. Position paper: management of men complaining of a small penis despite an actually normal size. The Journal of Sexual Medicine. 2013;10(1):294–303.
29. Yafi FA, Alzweri L, McCaslin IR, Libby RP, Sangkum P, Sikka SC, et al. Grower or shower? Predictors of change in penile length from the flaccid to erect state. Int J Impot Res. 2018;30(6):287–91.
30. Kayes O, Shabbir M, Ralph D, Minhas S. Therapeutic strategies for patients with micropenis or penile dysmorphic disorder. Nat Rev Urol. 2012 Sep;9(9):499–507.
31. Aslan Y, Atan A, Ömur Aydın A, Nalçacıoğlu V, Tuncel A, Kadıoğlu A. Penile length and somatometric parameters: a study in healthy young Turkish men. Asian J Androl. 2011;13(2):339–41.
32. Chrouser K, Bazant E, Jin L, Kileo B, Plotkin M, Adamu T, et al. Penile measurements in Tanzanian males: guiding circumcision deviced design and supply forecasting. Journal of Urology. 2013;190(2):544–50.
33. Habous M, Tealab A, Williamson B, Binsaleh S, El Dawy S, Mahmoud S, et al. Erect penile dimensions in a cohort of 778 middle eastern men: establishment of a nomogram. The Journal of Sexual Medicine. 2015;12(6):1402–6.
34. Park JK, Doo AR, Kim JH, Park HS, Do JM, Choi H, et al. Prospective investigation of penile length with newborn male circumcision and second to fourth digit ratio. CUAJ. 2016;10(9–10):E296–9.
35. Salama N. Consultation for small-sized penis in the Egyptian males: a case control study. Am J Mens Health. 2016;10(3):220–7.
36. Yuruk E, Temiz MZ, Colakerol A, Muslumanoglu AY. Mucosal cuff length to penile length ratio may affect the risk of premature ejaculation in circumcised males. Int J Impot Res. 2016;28(2):54–6.
37. Xu L, Zhao M, Chen W, Li Y, Yang Z, Ma N, et al. Augmentation phalloplasty with autologous dermal fat graft in the treatment of "small penis." Annals of Plastic Surgery. 2016;77(Supplement 1):S60–5.
38. Agustinus, I'tishom R, Pramesti D. Biologi reproduksi pria. Surabaya: Airlangga University Press dan PIPS Unair; 2018. 5,14,23,27,130,131.
39. Gao J, Xu C, Zhang J, Liang C, Su P, Peng Z, et al.

Effects of adult male circumcision on premature ejaculation: results from a prospective study in China. BioMed Research International. 2015;2015:1–8.
40. Task Force On Circumsicion. Male Circumcision. Pediatrics. 2012;130(3):756–85.
41. Margolin EJ, Pagano MJ, Aisen CM, Onyeji IC, Stahl PJ. Beyond curvature: prevalence and characteristics of penile volume-loss deformities in men with Peyronie's disease. Sexual Medicine. 2018;6(4):309–15.
42. Clavell-Hernández J, Wang R. Penile size restoration with nondegloving approach for Peyronie's disease: initial experience. The Journal of Sexual Medicine. 2018;15(10):1506–13.
43. Levine LA, Rybak J. Traction therapy for men with shortened penis prior to penile prosthesis implantation: a pilot study. The Journal of Sexual Medicine. 2011;8(7):2112–7.
44. Tran H, Goldfarb R, Ackerman A, Valenzuela RJ. Penile lengthening, girth, and size preservation at the time of penile prosthesis insertion. Sexual Medicine Reviews. 2017;5(3):403–12.
45. Moriya K, Nakamura M, Nishimura Y, Kitta T, Kanno Y, Chiba H, et al. Factors affecting post-pubertal penile size in patients with hypospadias. World J Urol. 2016;34(9):1317–21.
46. Littara A, Melone R, Morales-Medina JC, Iannitti T, Palmieri B. Cosmetic penile enhancement surgery: a 3-year single-centre retrospective clinical evaluation of 355 cases. Sci Rep. 2019;9(1):1–10.
47. Shaeer O, Shaeer K. Impact of penile size on male sexual function and role of penile augmentation surgery. Curr Urol Rep. 2012;13(4):285–9.
48. Rabelo-Júnior CN, Bonfá E, Carvalho JF, Cocuzza M, Saito O, Abdo CH, et al. Penile alterations with severe sperm abnormalities in antiphospholipid syndrome associated with systemic lupus erythematosus. Clin Rheumatol. 2013;32(1):109–13.
49. Rabelo-Júnior CN, Freire de Carvalho J, Lopes Gallinaro A, Bonfá E, Cocuzza M, Saito O, et al. Primary antiphospholipid syndrome: morphofunctional penile abnormalities with normal sperm analysis. Lupus. 2012;21(3):251–6.
50. Vecchi AP, Borba EF, Bonfá E, Cocuzza M, Pieri P, Kim CA, et al. Penile anthropometry in systemic lupus erythematosus patients. Lupus. 2011;20(5):512–8.
51. Berookhim BM, Nelson CJ, Kunzel B, Mulhall JP, Narus JB. Prospective analysis of penile length changes after radical prostatectomy: Penile length changes after radical prostatectomy. BJU Int. 2014;113(5b):E131–6.
52. Kwon YS, Farber N, Yu JW, Rhee K, Han C, Ney P, et al. Longitudinal recovery patterns of penile length and the underexplored benefit of long-term phosphodiesterase-5 inhibitor use after radical prostatectomy. BMC Urol. 2018;18(37):1–8.