

# Circumcision does not have effect on premature ejaculation: A systematic review and meta-analysis

Y. Yang\*  | X. Wang\* | Y. Bai | P. Han

Department of Urology/Institute of Urology, West China Hospital, Sichuan University, Chengdu, Sichuan, China

## Correspondence

Ping Han, Department of Urology/Institute of Urology, West China Hospital, Sichuan University, Chengdu, Sichuan, China.  
Email: hanpingwch@163.com

## Summary

We attempted to evaluate whether circumcision has an effect on premature ejaculation. We searched three databases: PubMed, EMBASE and Google scholar on 1 May 2016 for eligible studies that referred to male sexual function after circumcision. No language restrictions were imposed. The Cochrane Collaboration's RevMan 5.2 software was employed for data analysis, and the fixed or the random-effect model was selected depending on the heterogeneity. Twelve studies were included in the meta-analysis, containing a total of 10019 circumcised and 11570 uncircumcised men. All studies were divided into five subgroups by types of study design to evaluate the effect of circumcision on premature ejaculation (PE). Intravaginal ejaculation latency time (IELT), difficulty of orgasm, erectile dysfunction (ED) and pain during intercourse were also assessed because PE was usually discussed along with these subjects. There were no significant differences in PE (odds ratio [OR], 0.90; 95% confidence interval (CI), 0.72-1.13;  $p = .37$ ) and orgasm (OR, 1.04; 95% CI, 0.89-1.21;  $p = .65$ ) between circumcised and uncircumcised group. However, IELT (OR, 0.72; 95% CI, 0.60-0.83;  $p < .00001$ ), ED (OR, 0.42; 95% CI, 0.22-0.78;  $p = .40$ ) and pain during intercourse (OR, 0.36; 95% CI, 0.17-0.76;  $p = .007$ ) favoured circumcised group. Based on these findings, circumcision does not have effect on PE.

## KEYWORDS

circumcision, premature ejaculation, sexual function

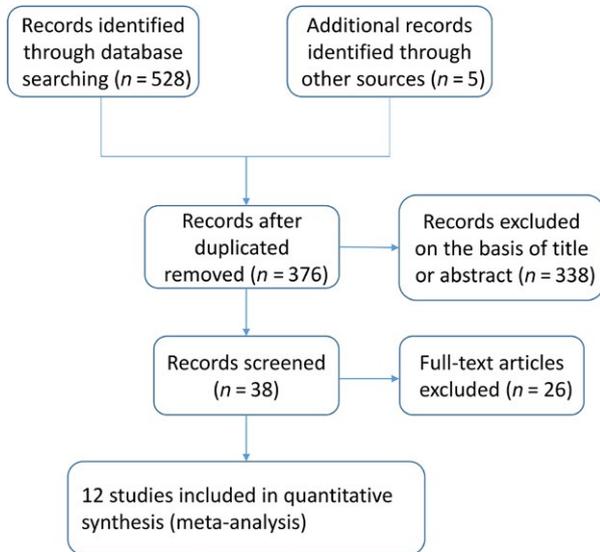
## 1 | INTRODUCTION

Circumcision is a common surgical procedure through the ages for medical, cultural or religious purposes. Approximately one-third of the world's male population have been circumcised (Frisch et al., 2013). The potential benefits of male circumcision included providing substantial protect against heterosexual HIV transmission and preventing urinary tract infections, some sexually transmitted infections (STI) and penile cancer (Cox, Krieger, & Morris, 2015). The incidence of penile cancer among men with phimosis or HPV infection is higher than those without either one (Stratton & Culkin, 2016). The fact is now convinced that circumcision leads a significant lower morbidity of penile cancer (Stratton & Culkin, 2016). However, circumcision is not recommended

for boys in neonatal period, in spite that some religious families have kept the procedure as a routine for centuries (Frisch et al., 2013).

The effect of male circumcision on sexual functions has been investigated for a long time, and it is still controversial. According to the survey reported by Frisch, Lindholm, and Grønbaek (2011), circumcision was associated with frequent orgasm difficulties in Danish men and with a range of frequent sexual dysfunctions in women, including orgasm difficulties, dyspareunia and a sense of incomplete sexual needs fulfilment. However, another survey by Gao et al. (2015) showed that men after circumcision experienced higher intravaginal ejaculation latency time (IELT) and better scores of control over ejaculation, satisfaction with sexual intercourse and severity of premature ejaculation (PE) than men before circumcision. Alp et al. (2014) also concluded that men had longer IELT after procedure ( $p = .001$ ), but we got a  $p = .23$  based on the data in this article. As no more information

\*Both authors contributed to the work equally and were listed as co-first authors.



**FIGURE 1** Flow diagram for study selection

on data adjustment was mentioned, the result was doubtful. In the contrast, the incidence of PE was higher among circumcised men than uncircumcised men in Richters, Smith, de Visser, Grulich, and Rissel (2006) study.

PE is one of the most common male sexual dysfunctions around the world. Although it is clearly defined as ejaculation that always or nearly always occurs before or within about 1 min of vaginal penetration (Serefoglu et al., 2014), the aetiology and pathogenesis of PE remain unclear. Redundant prepuce was found abundant nerves which led to high sensitivity (Malkoc et al., 2012). As a result, it might play a role in PE. A meta-analysis conducted by Tian et al. (2013)

revealed that circumcision made no sense on male sexual function, including erectile dysfunction (ED), PE, IELT, difficulty of orgasm and dyspareunia. However, only five studies focused on the relation of PE and circumcision were included. Another systematic review by Morris and Krieger (2013) including five studies concluded that circumcision did not have effect on PE, either. Nevertheless, several articles have been newly published in the past 3 years. Thus, we attempt to answer whether male circumcision has effect on PE.

## 2 | MATERIALS AND METHODS

### 2.1 | Search strategy and study selection

Published studies were identified by searching electronic databases. We searched three databases: PubMed, EMBASE and Google scholar on 1 May 2016. The search terms used to identify potentially eligible studies from each data source were as follows: “circumcision, male”; “circumcision”; “sexual dysfunction”; and “ejaculation.” Two of our authors independently screened all citations and abstracts identified by the search strategy used to screen eligible studies. There were no languages or publication year limitations. Only studies that compared PE with male circumcision status were included. Studies with insufficient data were not included due to potential statistical analysis limitations. Additionally, studies among homosexual men were excluded because the evaluation criteria of sexual function were unclear.

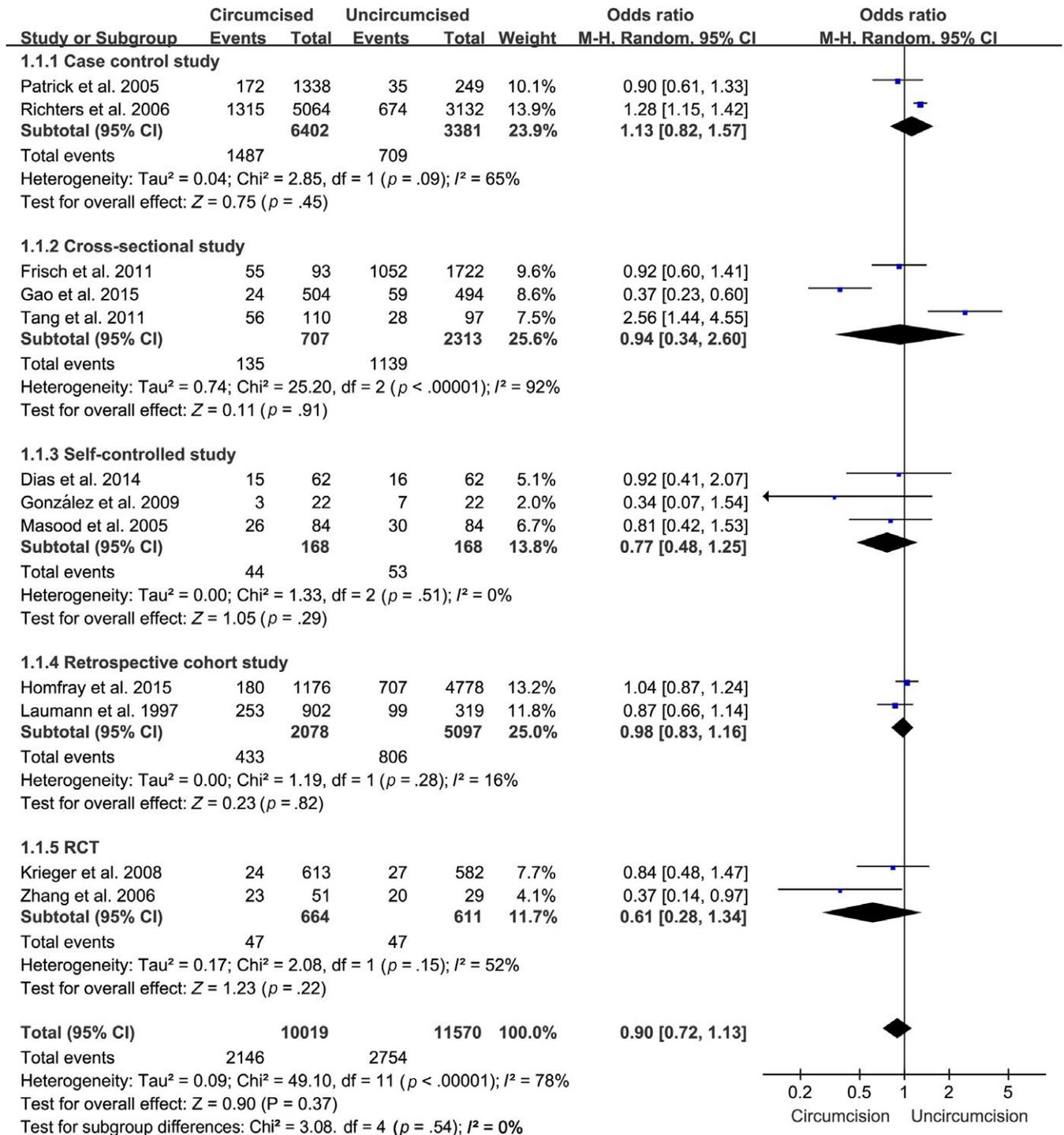
### 2.2 | Data abstraction and quality assessment

Data was extracted and entered twice (two authors) into a standard Excel template and cross-checked by each data extractor. Where

**TABLE 1** Characteristics of the eligible studies

Resource	Country	Diagnostic criterion for PE	Study design	Sampling size	Duration (months)	NOS
Laumann et al. (1997)	USA	NA	Retrospective cohort study	1221	-	5
Masood et al. (2005)	UK	Subjective report	Self-controlled trial	84	3	-
Patrick et al. (2005)	USA	DSM-IV-TR	Case-control study	1587	1	6
Richters et al. (2006)	Australia	NA	Case-control study	8196	-	7
Zhang et al. (2006)	China	IELT, PRO	RCT, Self-controlled trial	80	18	-
Krieger et al. (2008)	Kenya	NA	RCT	1195	24	-
Cortés-González et al. (2009)	Spain	Subjective report	Self-controlled trial	22	3	-
Frisch et al. (2011)	Denmark	IELT, PRO	Cross-sectional study	1815	-	-
Tang and Khoo (2011)	Malaysia	PEDT	Cross-sectional study	207	-	-
Dias et al. (2014)	Portugal	BMSFI	Self-controlled trial	62	11.49	-
Gao et al. (2015)	China	IELT, PRO	Cross-sectional study	998	12	-
Homfray et al. (2015)	Britain	NA	Retrospective cohort study	5954	-	6

BMSFI, Brief Sexual Function Questionnaire and Changes in Sexual Functioning Questionnaire; DSM-IV-TR, Diagnostic and Statistical Manual of Mental Disorders; IELT, intravaginal ejaculation latency time; ISSM, International Society of Sexual Medicine; NA, not applicable; NOS, Newcastle-Ottawa Scale; PE, premature ejaculation; PEDT, premature ejaculation diagnostic tool; PRO, patient-reported outcome; RCT, randomised controlled trial.

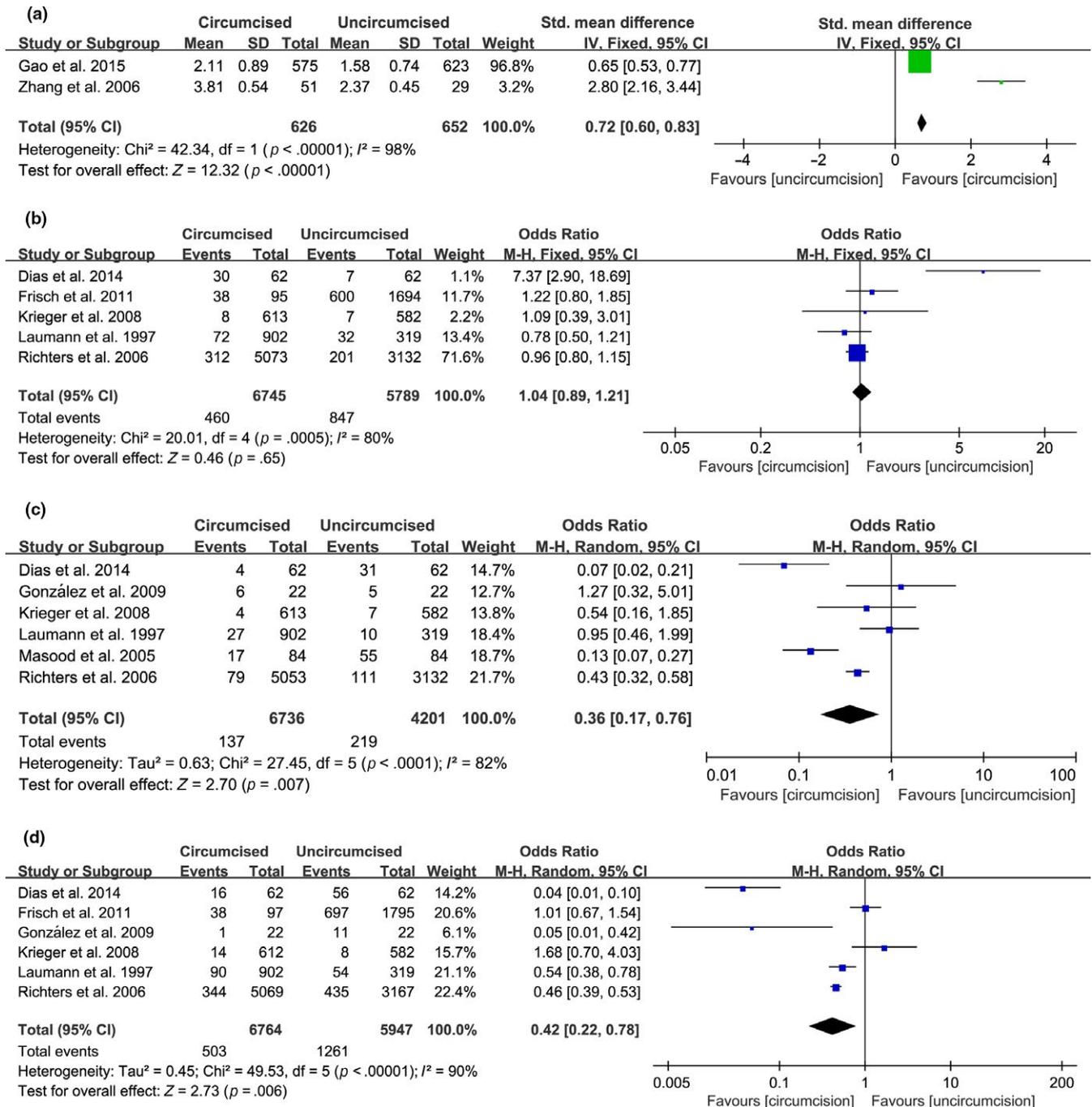


**FIGURE 2** PE in circumcised and uncircumcised groups

required data were likely available but not presented in a published included study, the study authors were contacted for the relevant data. Study populations described in more than one paper were included only once, using data from the paper with most information on the study methods. The extracted data included data sources, eligibility, methods, participant characteristics, interventions and results. The quality of these eligible citations was assessed using the Newcastle-Ottawa Scale, which was independently scored by two investigators.

**2.3 | Data synthesis and analysis**

The effect of circumcision on PE was estimated using odds ratios (OR) and confidence intervals (CIs). The Review Manager 5.2 software (The Cochrane Collaboration, Oxford, UK) statistical package was used to analyse the ORs for dichotomous variables and the mean differences (MD) for continuous variables. The Mantel-Haenszel type method was used to estimate the pooled ORs. The proportion of heterogeneity across the studies was tested using the I<sup>2</sup> index. If I<sup>2</sup> < 50%, the



**FIGURE 3** (a) IELT in circumcised and uncircumcised groups. (b) Difficulty of orgasm in circumcised and uncircumcised groups. (c) Pain during intercourse in circumcised and uncircumcised groups. (d) ED in circumcised and uncircumcised groups

variation of the studies was considered to be homogenous and the fixed-effect model was adopted. If  $I^2 \geq 50\%$ , the variation of studies was considered as significantly heterogeneous and the random-effect model was adopted. All  $p$  values were two-tailed, and  $\alpha < .05$  was considered statistically significant.

## 2.4 | Additional remarks

We regarded PE and IELT as primary outcomes. In addition, ED, difficulty of orgasm and pain during intercourse were discussed

secondarily for these common sexual dysfunctions in men usually accompanied PE.

## 3 | RESULTS

### 3.1 | Description of eligible papers

A total of 533 studies were searched, 521 of which were excluded for various reasons (Fig. 1). At last, 12 studies evaluating the effect of circumcision on PE were included (Table 1). It is remarkable that

both self-control and randomised control were applied in Zhang et al. assay. Study populations from Europe ( $n = 5$ ), Asia ( $n = 3$ ), the United States ( $n = 2$ ), Oceania ( $n = 1$ ) and Africa ( $n = 1$ ) were well-represented.

### 3.2 | Premature ejaculation (PE)

Considering that heterogeneity was detected among 12 studies, we divided them into five subgroups by types of study design, including case-control study ( $n = 2$ ), cross-sectional study ( $n = 3$ ), self-controlled study ( $n = 3$ ), retrospective cohort study ( $n = 2$ ) and randomised controlled trial (RCT) ( $n = 2$ ). Totally, our meta-analysis concluded that circumcision status was not associated with PE (OR, 0.90; 95% CI, 0.72-1.13;  $p = .37$ ), neither did the five subgroup respectively (Fig. 2). For details, two studies (Gao et al., 2015; Zhang, Zhao, Zheng, Xiao, & He, 2006) indicated a lower prevalence in circumcised men, while two (Richters et al., 2006; Tang & Khoo, 2011) favoured uncircumcised status. No significant difference was detected in four studies (Dias et al., 2014; Krieger et al., 2008; Morris & Krieger, 2013; Tang & Khoo, 2011) on the basis of own control. Gao et al. (2015) study revealed a lower PE prevalence in circumcised group at 6-month, 9-month and 12-month visit. Frisch et al. (2011) conducted a cross-sectional study in Denmark. The proportion of PE among circumcised men and uncircumcised group was 59% and 61% respectively (OR, 0.92 95% CI, 0.60-1.41). Coming to orgasm too quickly was thought as PE in Richters et al. (2006) study. It happened on 26% of circumcision men and 22% of control group (OR, 1.28; 95% CI, 1.15-1.42;  $p < .0001$ ). However, the difference was not statistically significant after adjustment ( $p = .11$ , no more details mentioned). Tang and Khoo (2011) showed that 50.9% of circumcised men and 28.9% of uncircumcised men suffered from PE (OR, 2.56; 95% CI, 1.44-4.55;  $p = .001$ ).

### 3.3 | Intravaginal ejaculation latency time (IELT)

Intravaginal ejaculation latency time (IELT) is defined as the time between the start of vaginal intromission and intravaginal ejaculation, which plays a key role in the diagnosis of PE. An IELT less than 1 min can be diagnosed as PE. In the present meta-analysis, IELT was applied in a cross-sectional study (Gao et al., 2015) and a RCT (Zhang et al., 2006), and it demonstrated that circumcised men had a longer IELT ( $p < .00001$ ) (Fig. 3A). However, the lowest median IELT was 1.58 min among uncircumcised men in Gao et al. (2015) study.

### 3.4 | Difficulty of orgasm

Five studies (Cortés-González, Arratia-Maqueo, Martínez-Montelongo, & Gómez-Guerra, 2009; Dias et al., 2014; Frisch et al., 2011; Laumann, Masi, & Zuckerman, 1997; Richters et al., 2006) compared difficulty of orgasm between circumcised and uncircumcised men. Totally, there was no significant difference between two groups (OR, 1.04; 95% CI, 0.89-1.21;  $p = .65$ ) (Fig. 3B).

### 3.5 | Pain during intercourse

We only took pain evaluated by men into account, regardless of pain felt by partners. Six studies (Cortés-González et al., 2009; Dias et al., 2014; Krieger et al., 2008; Laumann et al., 1997; Masood et al., 2005; Richters et al., 2006) addressed pain during intercourse and showed a significantly lower prevalence in the circumcised group (OR, 0.36; 95% CI, 0.17-0.76;  $p = .007$ ) (Fig. 3C). Three studies (Dias et al., 2014; Masood et al., 2005; Richters et al., 2006) favoured circumcised group, while the others proved nonsignificant. Among three studies (Cortés-González et al., 2009; Dias et al., 2014; Masood et al., 2005) which compared the difference between pre- and post-circumcision based on the own control, Masood et al. (2005) and Dias et al. (2014) reported that the reduction of pain during coitus was observed after circumcision, while Cortés-González et al. (2009) revealed a nonsignificantly different outcome ( $p = .23$ ). In Krieger et al. (2008) study, prevalence of pain in uncircumcised and circumcised group at baseline was 7.3% (86/1179) and 7.7% (87/1125) respectively. After 24-month follow-up, it decreased as low as 1.2% (7/582) and 0.7% (4/613), which remained nonsignificantly different, either.

### 3.6 | Erectile dysfunction (ED)

Six studies (Cortés-González et al., 2009; Dias et al., 2014; Frisch et al., 2011; Krieger et al., 2008; Laumann et al., 1997; Masood et al., 2005; Richters et al., 2006) evaluated erectile function between two groups. In Dias et al. (2014) study, patients were divided into five subgroups referred to frequency of ED: not at all, rarely, sometimes, often and every time. According to the authors, the last three subgroups were recognised as event, which was 9.7% and 25.8% in pre- and post-circumcision group ( $p = .002$ ). The difference was statistically significant totally ( $p = .40$ , OR: 0.42 [0.22, 0.78]) (Fig. 3D). Four studies (Cortés-González et al., 2009; Dias et al., 2014; Laumann et al., 1997; Richters et al., 2006) demonstrated a lower proportion of erectile dysfunction in circumcised group.

## 4 | DISCUSSION

Although two meta-analysis had evaluated the effect of circumcision on PE, (Morris & Krieger, 2013; Tian et al., 2013) to our knowledge, the present study the most comprehensive systematic review investigating the relationship of circumcision and PE. And we found that circumcision was not associated with a decreased or increased prevalence of PE.

Historically, PE can be classified as lifelong and acquired subtypes by frequency of events. It has been recognised as a complicated sexual dysfunction among 8%-30% men (McCabe et al., 2016). Time of vaginal penetration for less than 1 min, a loss of control, negative sexual consequences and disturbance to sexual partners are necessary to diagnose PE (Jannini et al., 2015). Aetiologies and pathogenesis of PE are complex and poorly understood. Both biological and psychological factors play roles in PE (Porst, 2011). There are some risk factors of PE,

such as stress, obesity and diabetes mellitus. Not only patients but also urologists feel confused about diagnosis of PE, for patients often complain “ejaculate too early” or “take no control of ejaculation” instead of more details on intercourse.

Physiology of ejaculation was complicated, and pathophysiology of PE has been discussed for decades. Serotonin (5-HT) plays an important role in people's emotional activities, and hypoactivity of 5-HT was closely related to premature or delayed ejaculation (Porst, 2011). Selective serotonin reuptake inhibitor can improve level of 5-HT by inhibiting 5-HT transporter (5-HTT). Polymorphism of SLC6A4, the 5-HTT gene, has been investigated a lot, but none of data were convinced Jern, Eriksson, and Westberg (2013). Some studies suggested that dopamine receptor (D), especially D3 (one of the subtypes), might play a positive role in ejaculation (Peeters & Giuliano, 2008). A study found that men with PE had a significantly lower level of serum nitric oxide (NO) than those without PE (Otuntemur et al., 2014). They also demonstrated that NO level was increased after SSRI treatment. Another hypothesis highlighted sensation of glans especially among patients with phimosis. Higher threshold of sensation of dorsal nerve was detected in uncircumcised men by Malkoc et al. (2012) study. Intensive-free nerve endings (FNE) of the removed foreskin after circumcision were also found. However, correlation between FNE and PE was still not clear.

Managements for PE include psychological services, oral administration of SSRIs and topical anaesthetic agents (Jannini et al., 2015). The effect of circumcision on PE has been debated for decades. According to most of studies, circumcision did not have effect on PE. The present meta-analysis concluded the same. Bronselaer et al. (2013) found that circumcision decreased penile sensitivity, resulting in a higher percentage of discomfort among circumcised men. However, Cortés-González et al. (2009) study indicated that circumcision could not alter the threshold of penile sensation. A multinational survey enrolled over 300 men implicated that the median IELT was 6.7 min and 6.0 min in circumcised and uncircumcised group, respectively, and the difference was not statistically significant (Waldinger et al., 2005). Dias et al. (2014) indicated a lower incidence of orgasm difficulty in uncircumcised men, but our meta-analysis revealed nonsignificant. In addition, decreased sexual pleasure and lower orgasm intensity were observed in circumcised men (Bronselaer et al., 2013).

The present meta-analysis showed that there was no significant difference of PE between circumcised group and uncircumcised group. However, heterogeneity among 12 studies should be noticed. Only two studies were randomised controlled trial (RCT). The others were either self-controlled or retrospective studies including cross-sectional and case-control studies. Thus, we set five subgroups based on study design; test for subgroup differences was minimal ( $I^2 = 0\%$ ,  $p = .54$ ). The different diagnostic criteria of PE among these 12 studies may also result in heterogeneity. In four studies (Homfray et al., 2015; Krieger et al., 2008; Laumann et al., 1997; Richters et al., 2006), no diagnostic criteria were even mentioned. PE diagnostic tool (PEDT), IELT and patient-reported outcome (PRO), Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) as well as other criteria were taken into

consideration alone or simultaneously among included studies. Thus, diagnostic criteria of PE were supposed to be unified.

The study (Laumann et al., 1997) first reported prophylactic effect and sexual practice of circumcision in USA. The study demonstrated no significant difference on sexual transmitted infection (STI) among uncircumcised and circumcised men; however, a lower incidence of ED was observed among circumcised men than uncircumcised men. Three studies (Alp et al., 2014; Dias et al., 2014; Masood et al., 2005) investigated the association of circumcision and PE or IELT based on own control. The study conducted by Zhang et al. (2006) highlighted the effect of circumcision on patients with PE and phimosis ( $n = 51$ ). It showed that PE was improved among 62.7% of patients at 18 months visit after circumcision (Zhang et al., 2006). As other treatment applied on patients since visit at 12 months, data at 18 months were abandoned. And no study has reported such a high curative ratio of PE. IELT was longer among circumcised group, but only two studies were included in the present meta-analysis. Large, prospective RCTs should be anticipated in the future to compare IELT in circumcised and uncircumcised groups.

Our meta-analysis indicated that circumcised patients were less likely to suffer pain during intercourse. As paraphimosis was an emergency among uncircumcised men, we assumed that the feeling of discomfort might be due to incarceration of prepuce and stretch of frenula praeputii.

In previous studies, when premature ejaculation was evaluated, ED, pain during intercourse and difficulty in orgasm were usually assessed at the same time. Certain patients complained about PE and ED simultaneously, but the pathophysiology is poorly understood. These two sexual dysfunctions may interact as both cause and effect, or result from psychological abnormalities (Jannini et al., 2015). No studies have investigated the effect of pain during intercourse and difficulty in orgasm on PE, either. Besides, whether the age of circumcision could influence on sexual function in adults was not discussed here, although circumcision was commonly operated among prepubertal boys. Like study by Shaer (2013), our meta-analysis also concluded that circumcision should not be recognised as a risk for PE.

In summary, circumcision does not help to improve ejaculation function. Therefore, circumcision should not be provided for patients with PE and phimosis, although the procedure can reduce pain during intercourse. In addition, circumcision could not result in PE.

## CONFLICT OF INTEREST

None authors declare financial interests.

## AUTHORS' CONTRIBUTIONS

Yang Y conceived the study and participated in the literature search as well as statistical analysis. Wang X participated in the literature search and drafted the manuscript. Thus, Yang Y and Wang X contributed to this study equally and were listed as co-first authors. Bai Y helped to draft the manuscript. Han P reviewed the manuscript. All authors read and approved the final manuscript.

## REFERENCES

- Alp, B. F., Uguz, S., Malkoc, E., Ates, F., Dursun, F., Okcelik, S., ... Karademir, A. K. (2014). Does circumcision have a relationship with ejaculation time? Premature ejaculation evaluated using new diagnostic tools. *International Journal of Impotence Research*, 26, 121–123.
- Bronselaer, G. A., Schober, J. M., Meyer-Bahlburg, H. F., T'Sjoen, G., Vlietinck, R., & Hoebeke, P. B. (2013). Male circumcision decreases penile sensitivity as measured in a large cohort. *BJU International*, 111, 820–827.
- Cortés-González, J. R., Arratia-Maqueo, J. A., Martínez-Montelongo, R., & Gómez-Guerra, L. S. (2009). Does circumcision affect male's perception of sexual satisfaction? *Archivos Espanoles de Urologia*, 62, 733–736.
- Cox, G., Krieger, J. N., & Morris, B. J. (2015). Histological Correlates of Penile Sexual Sensation: Does Circumcision Make a Difference? *Sexual Medicine*, 3, 76–85.
- Dias, J., Freitas, R., Amorim, R., Espiridião, P., Xambre, L., & Ferraz, L. (2014). Adult circumcision and male sexual health: A retrospective analysis. *Andrologia*, 46, 459–464.
- Frisch, M., Aigrain, Y., Barauskas, V., Bjarnason, R., Boddy, S. A., Czauderna, P., ... Wijnen, R. (2013). Cultural bias in the AAP's 2012 Technical Report and Policy Statement on male circumcision. *Pediatrics*, 131, 796–800.
- Frisch, M., Lindholm, M., & Grønbaek, M. (2011). Male circumcision and sexual function in men and women: A survey-based, cross-sectional study in Denmark. *International Journal of Epidemiology*, 40, 1367–1381.
- Gao, J., Xu, C., Zhang, J., Liang, C., Su, P., Peng, Z., ... Zhang, X. (2015). Effects of adult male circumcision on premature ejaculation: Results from a prospective study in China. *BioMed Research International*, 2015, 417846. <https://doi.org/10.1155/2015/417846>.
- Homfray, V., Tanton, C., Mitchell, K. R., Miller, R. F., Field, N., Macdowall, W., & Mercer, C. H. (2015). Examining the association between male circumcision and sexual function: Evidence from a British probability survey. *AIDS*, 29, 1411–1416.
- Jannini, E. A., Ciocca, G., Limoncin, E., Mollaioli, D., Di Sante, S., Gianfrilli, D., ... Lenzi, A. (2015). Premature ejaculation: Old story, new insights. *Fertility and Sterility*, 104, 1061–1073.
- Jern, P., Eriksson, E., & Westberg, L. (2013). A reassessment of the possible effects of the serotonin transporter gene linked polymorphism 5-HTTLPR on premature ejaculation. *Archives of Sexual Behavior*, 42(1), 45–49.
- Krieger, J. N., Mehta, S. D., Bailey, R. C., Agot, K., Ndinya-Achola, J. O., Parker, C., & Moses, S. (2008). Adult male circumcision: Effects on sexual function and sexual satisfaction in Kisumu, Kenya. *The Journal of Sexual Medicine*, 5, 2610–2622.
- Laumann, E. O., Masi, C. M., & Zuckerman, E. W. (1997). Circumcision in the United States. Prevalence, prophylactic effects, and sexual practice. *JAMA*, 277, 1052–1057.
- Malkoc, E., Ates, F., Tekeli, H., Kurt, B., Turker, T., & Basal, S. (2012). Free nerve ending density on skin extracted by circumcision and its relation to premature ejaculation. *Journal of Andrology*, 33, 1263–1267.
- Masood, S., Patel, H. R., Himpson, R. C., Palmer, J. H., Mufti, G. R., & Sheriff, M. K. (2005). Penile sensitivity and sexual satisfaction after circumcision: Are we informing men correctly? *Urologia Internationalis*, 75, 62–66.
- McCabe, M. P., Sharlip, I. D., Lewis, R., Atalla, E., Balon, R., Fisher, A. D., ... Segraves, R. T. (2016). Incidence and Prevalence of Sexual Dysfunction in Women and Men: A Consensus Statement from the Fourth International Consultation on Sexual Medicine 2015. *The Journal of Sexual Medicine*, 13, 144–152.
- Morris, B. J., & Krieger, J. N. (2013). Does male circumcision affect sexual function, sensitivity, or satisfaction?—a systematic review. *The Journal of Sexual Medicine*, 10, 2644–2657.
- Otuntemur, A., Ozbek, E., Kirecci, S. L., Ozcan, L., Dursun, M., Cekmen, M., & Ozdogan, H. K. (2014). Relevance of serum nitric oxide levels and the efficacy of selective serotonin reuptake inhibitors treatment on premature ejaculation: Decreased nitric oxide is associated with premature ejaculation. *Andrologia*, 46, 951–955.
- Patrick, D. L., Althof, S. E., Pryor, J. L., Rosen, R., Rowland, D. L., Ho, K. F., ... Jamieson, C. (2005). Premature ejaculation: An observational study of men and their partners. *The Journal of Sexual Medicine*, 2, 358–367.
- Peeters, M., & Giuliano, F. (2008). Central neurophysiology and dopaminergic control of ejaculation. *Neuroscience and Biobehavioral Reviews*, 32, 438–453.
- Porst, H. (2011). An overview of pharmacotherapy in premature ejaculation. *The Journal of Sexual Medicine*, 8(Suppl 4), 335–341.
- Richters, J., Smith, A. M., de Visser, R. O., Grulich, A. E., & Rissel, C. E. (2006). Circumcision in Australia: Prevalence and effects on sexual health. *International Journal of STD and AIDS*, 7, 547–554.
- Serefoglu, E. C., McMahon, C. G., Waldinger, M. D., Althof, S. E., Shindel, A., Adaiyan, G., ... Torres, L. O. (2014). An evidence-based unified definition of lifelong and acquired premature ejaculation: Report of the second International Society for Sexual Medicine Ad Hoc Committee for the Definition of Premature Ejaculation. *The Journal of Sexual Medicine*, 11, 1423–1441.
- Shaer, O. (2013). The global online sexuality survey (GOSS): The United States of America in 2011 Chapter III—Premature ejaculation among English-speaking male Internet users. *The Journal of Sexual Medicine*, 10, 1882–1888.
- Stratton, K. L., & Culkin, D. J. (2016). A Contemporary Review of HPV and Penile Cancer. *Oncology (Williston Park, NY)*, 30, 245–249.
- Tang, W. S., & Khoo, E. M. (2011). Prevalence and correlates of premature ejaculation in a primary care setting: A preliminary cross-sectional study. *The Journal of Sexual Medicine*, 8, 2071–2078.
- Tian, Y., Liu, W., Wang, J. Z., Wazir, R., Yue, X., & Wang, K. J. (2013). Effects of circumcision on male sexual functions: A systematic review and meta-analysis. *Asian Journal of Andrology*, 15, 662–666.
- Waldinger, M. D., Quinn, P., Dilleen, M., Mundayat, R., Schweitzer, D. H., & Boolell, M. (2005). A multinational population survey of intravaginal ejaculation latency time. *The Journal of Sexual Medicine*, 2, 492–497.
- Zhang, S. J., Zhao, Y. M., Zheng, S. G., Xiao, H. W., & He, Y. S. (2006). Correlation between premature ejaculation and redundant prepuce. *Zhonghua Nan Ke Xue=National Journal of Andrology*, 12, 225–227.

**How to cite this article:** Yang Y, Wang X, Bai Y, Han P. Circumcision does not have effect on premature ejaculation: A systematic review and meta-analysis. *Andrologia*. 2017;e12851. <https://doi.org/10.1111/and.12851>