

A Community-based Study on Prevalence and

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Abstract

Background: Globally, erectile dysfunction burden (ED) is rising appreciably and it is projected to affect about 332 million men by the year 2025. This rise is attributable to the rising incidence of conditions associated with ED including obesity, diabetes, hypertension, coronary artery disease and depression. We conducted this community-based screening to elucidate on the prevalence of ED and its associated factors among men residing in an urban community in Tanzania. Methods: We interviewed 441 men aged at least 18 years. Diabetes and hypertension were defined as per the International Diabetes Federation (IDF) and the 7th Report of the Joint National Committee (JNC 7) respectively. The 5-item version of the International Index of Erectile Function (IIEF-5) Scale was used to assess for erectile dysfunction. Multivariate logistic regression analyses were performed to explore the factors associated with ED.

Index terms—erectile dysfunction, diabetes, hypertension, excess body weight, community-based.

Plain English Summary-Erectile dysfunction (ED) is defined as persistent inability to attain and/or maintain an erection sufficient for satisfactory sexual activity. ED is associated with old age and comorbidities including diabetes and hypertension amongst others. The incidence of ED is increasing globally and this is attributed to the aging population and the increase in the incidence of diabetes and hypertension.

We aimed to determine the burden of ED among male residents of Kinondoni district, Dar es Salaam Tanzania. We recruited and interviewed 441 men aged at least 18 years. We utilized the 5-item version of the International Index of Erectile Function (IIEF-5) Scale for erectile dysfunction assessment. We defined diabetes and hypertension according to the International Diabetes Federation and the 7th Report of the Joint National Committee (JNC 7) respectively.

About a quarter of all men had some form of ED. Old age and diabetes were associated with a 5 times increased likelihood for having ED. We concluded that ED is a common problem among men of reproductive age and that in view of this, men with diabetes and hypertension should be offered screening services and treatment of ED as an integral component in their management.

1 I. Background

rectile dysfunction (ED) is defined as persistent inability to attain and/or maintain an erection sufficient for satisfactory sexual activity. Despite its benign nature, ED has the potential to impair personal interactions, quality of life and well-being of both patients and their partners. [2][3][4] The rates of ED increase with age almost always indicating endothelial dysfunction. [5][6][7][8][9][10][11][12][13][14] Furthermore, ED is associated with a number of medical conditions or their treatment including diabetes mellitus, hypertension, coronary artery disease and depression. [15][16][17][18][19][20][21][22] Establishing the burden of ED in the community is challenging and most clinicians lack adequate skills in detecting and/or managing it. 23,24 The reported rates worldwide have a wide variability ranging between 2% and 90% depending on the age, race, comorbidities, hospital-versus community-based, assessment tool, and geographical location

of the population studied. 8,12,[25][26][27][28][29][30][31][32][33][34][35][36][37][38][39][40] With the rising of comorbidities associated with ED worldwide, it is projected that its incidence will rise appreciably and that by year 2025, 332 million men will have some form of ED. To elucidate on the prevalence of ED and its associated factors in a Tanzanian community we undertook this cross-sectional study among Kinondoni district men.

2 II. Methods a) Study Procedures & Definition of Terms

We conducted this community-based crosssectional screening among men residing in Kinondoni district, Dar es Salaam, Tanzania in January 2016. 441 men of African descent aged at least 18 years were recruited and screened for erectile dysfunction. Participants were consented to participate in the study after they voluntarily came to the screening grounds for an organized general health check-up. Interviewers, mainly clinicians and nurses from the Jakaya Kikwete Cardiac Institute (JKCI) and Mwananyamala District Hospital were recruited and trained to administer the questionnaire and perform anthropometric, blood pressure (BP) and random/fasting blood glucose (RBG/ FBG) measurements. Weight and height were measured with standard scales and BMI was calculated by a ratio of weight (in kilograms) to height (in meters) squared. WHO BMI cut-off values were used to define underweight, normal, overweight and obese. Smoking history was sought and participants were categorized as current, past or a never smoker. Diabetes was diagnosed using RBG ≥ 11.1 mmol/L and/or FBG ≥ 7 mmol/L. Prediabetes was defined as FBG of 5.6-6.9 mmol/L and/or RBG of 7.8-11.0 mmol/L. Blood pressure was measured by digital BP machines where a systolic blood pressure (SBP) < 120 mmHg and a diastolic blood pressure (DBP) < 80 mmHg defined normotension. Pre-hypertension was defined by SBP of 120-139 mmHg or DBP of 80-89 mmHg, while SBP ≥ 140 mmHg or DBP ≥ 90 mmHg indicated hypertension. The 5-item version of the International Index of Erectile Function (IIEF-5) Scale was used to assess for erectile dysfunction. [45][46][47][48]

3 b) Statistical analysis

Continuous variables are summarized and presented as means ($\pm$ SD) while categorical variables are displayed as frequencies (percentages). Chi square tests and Student's T-test were used in comparison of categorical and continuous variables respectively. Bivariate analyses were performed to determine factors associated with ED. Significant factors on bivariate analysis were included in a logistic regression model to control for confounders. Odd ratios with 95% confidence intervals and p-values are reported. STATA v.11.0 was used for analysis, significance was set at $p < 0.05$ and all analyses were two-sided.

4 III. Results

Socio-demographic and clinical characteristics of 441 study participants is displayed in Table 1. The mean age was 47.1 (± 15.4) years and 63.7% were aged 40 years and above. 53.8% had completed primary school, 71% were married, and 14% ever smoked. The mean BMI was 26.6 (± 5.3) kg/m² and 57.6% of individuals had excess body weight (i.e. BMI ≥ 25). The mean blood glucose level was 6.1 (± 2.2) mmol/L and 8.2% had diabetes. The mean SBP and DBP were 146 (± 32) mmHg and 91 (± 20) mmHg respectively and 61.5% had hypertension.

Overall, 24% (106/441) of men in this study had some form of ED. Prevalence of ED increased with increase in age and weight i.e. 37% and 32% of those aged ≥ 55 and obese respectively had ED compared to 10.6% and 18.1% among those aged 18-39 years and normal BMI, ($p < 0.001$ and $p < 0.01$ respectively), Figure 1. Men with a positive smoking history had a 40% increased likelihood for ED compared to never smokers, (OR 1.4, 95%CI 0.7-2.5, $p > 0.05$). 63% of men with diabetes had ED compared to 30.4% with prediabetes and 19.1% with normal blood glucose, ($p < 0.01$ and $p < 0.001$ respectively). Participants with prehypertension (20.2%) and hypertension (29.3%) had significantly higher ED rates compared to normotensive persons (8.3%), $p < 0.05$ and $p < 0.001$ respectively.

Six variables including age, BMI, physical activity, smoking, hypertension, and diabetes status underwent bivariate analyses to assess if they have associations with ED. Four variables including age, BMI, hypertension and diabetes status revealed significant associations and these were added in a logistic regression model for further analysis. Table 2 displays results of multivariate logistic regression analysis. Men aged 40 years and above displayed a 5 times increased likelihood of having ED compared to those younger than 40 years, (OR 5.0, 95% CI 2.2-11.2, $p < 0.001$). Likewise, diabetes was associated with a 5 times increased odds of having ED, (OR 5.3, 95% CI 2.2-12.7, $p < 0.001$).

5 IV. Discussion

Nearly a quarter of men in this present study had ED. Our findings are close to a Chinese study by Bai et al which produced a prevalence of 28.3%. A wide variability in the prevalence of ED from 13.2% 50 in Egypt to 51.3 25 in Singapore observed among studies 12,25,42,51 is largely a result of variabilities in population characteristics and tools used for ED assessment among studies. Old age has been consistently shown to be a strong predictor of ED. 25 In this study, the rate of ED among participants aged 55 and above was 3 times compared to those in the age group 18-39 years. These findings echo the results of a landmark Massachusetts Male Aging Study 25 among others. 2,18,30 Aging is associated with comorbidities resulting

into atherosclerosis and ultimately vascular dysfunction with ED as one of the manifestations. Obesity was significantly associated with ED on bivariate analyses in this study. Such findings are in unison with Moreira et al study in which obesity proved to be a significant predictor on bivariate analysis but lost its significance after multivariate analysis. A study by Chung et al showed that obesity is not an underlying factor for ED per se, but it does increase the risk through development of chronic vascular disease. Numerous studies have suggested a dose dependent relationship between smoking and ED. Ever smokers in this study had a 40% increased likelihood for ED compared to never smokers. A systematic review by Cao et al found that ED was increased by 20% and 51% among past-and current-smokers respectively. Apart from its potential to cause direct toxic effects on the vascular endothelium, smoking is linked to ED through its potential to mediate systemic changes including hypercoagulability, platelet aggregation and thromboxane-prostacyclin imbalance. Diabetes is a well-established factor for ED. Participants with diabetes in our study had a 5 times increased odds for ED (OR 5.3) compared to diabetes-free persons. These current results have replicated the findings of a study by Zedan et al among Egyptian men which found an odds of 5.4. Other studies have consistently produced higher ED rates among diabetics compared to diabetes-free persons ranging between 35% and 75%. Diabetes is a risk factor for ED through its potential for causing autonomic neuropathy, gonadal dysfunction, and vascular and neurogenic impairment of penile smooth muscle. Hypertensive participants had a tripled likelihood of having ED compared to their normotensive counterparts ($p < 0.001$), however the significance was lost after multivariate logistic analyses. Hypertension and some antihypertensive drugs have been shown to increase the risk for ED. High blood pressure is known to interfere with blood flow to the corpora cavernosa by causing narrowing and loss of elasticity of arteries thus resulting to ED. Other factors including heavy alcohol consumption, depression, and low economic status have been associated with increased risk for ED but were beyond the scope of this study. Further studies on ED in this area could investigate on their association with ED among Tanzanian men.

This study has several strengths including; (i) the use of an internationally recognized tool for assessing ED that will make comparison with other studies feasible, (ii) the simultaneous assessment of obesity, diabetes and hypertension allowed us to confirm the presence of these risk factors rather than relying on participants' self-report. This study has some limitations as well, including; (i) the generalizability of our findings may be limited because the men screened in this study voluntarily came for screening and this might reflect a selected population of those either with a very good health seeking behavior or those having some health concerns necessitating medical help, (ii) Our assessment of ED was through interviews and we are aware that conditions like ED are highly associated with social stigmas. As a result of this, it is likely that ED was underreported by study participants, (iii) we made diagnoses of hypertension and diabetes based on a single point measurement of BP and RBG/FBG, thus our diabetes and hypertension rates might be overestimated, and (iv) our study was prone to several forms of bias including selection bias and nondifferential bias, inevitably due to its cross-sectional nature.

6 V. Conclusions

Several conclusions can be drawn from this present study: (i) ED affects one in four men over 18 years in urban Tanzania, (ii) age and diabetes mellitus are the strongest factors associated with ED, (iii) the high rates of ED among hypertensive and diabetic patients suggest that patients with such comorbidities should be screened for ED, (iv) with the increasing incidence of obesity, hypertension, diabetes and an aging population, ED may become a significant public health problem. In view of these findings: (i) services for diagnosis and treatment of ED should be readily available to men in developing nations, and (ii) health programs should be designed in developing nations to educate and empower individuals on healthy eating, physical activeness and health seeking behavior.

7 Declarations Ethical Approval and Consent to Participate

Ethical clearance was obtained from the Unit of Research of the Jakaya Kikwete Cardiac Institute (JKCI). Permission to conduct the study was granted by the Office of the Kinondoni District Commissioner. All participating men gave informed consent. manuscript development of this research. The authors assume the responsibility for this work.

8 Authors Contributions

MJ, PK, and PP made contributions in study designing. PP and PN performed all data management and manuscript writing. The initial draft was revised by PK, HM, NS and MJ. All authors contributed to and approved the final manuscript version.

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Figure 1: A

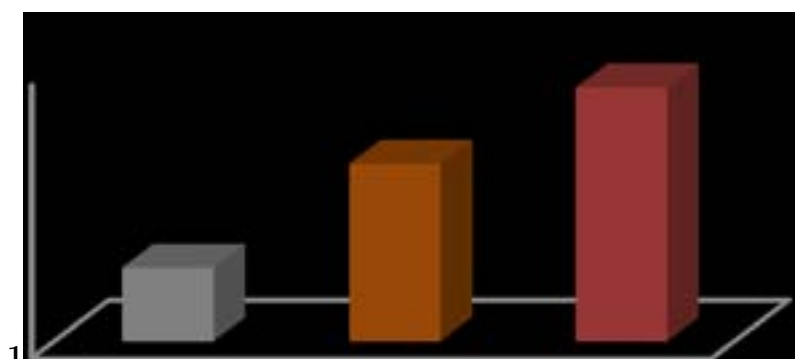


Figure 2: Figure 1 :

1

Characteristic	n (%)
Age groups	
18-39	160 (36.3%)
40-54	135 (30.6%)
≥55	146 (33.1%)
Education level	
None	12 (02.7%)
Primary	237 (53.8%)
Secondary	139 (31.5%)
University	53 (12.0%)
Marital status	
Single	95 (21.6%)
Married	313 (71.0%)
Divorced	24 (05.4%)
Widowed	9 (02.0%)
Smoking status	
Non-smoker	379 (86.0%)
Current smoker	9 (02.0%)
Past smoker	53 (12.0%)
BMI status	
Underweight	14 (03.2%)
Normal	173 (39.2%)
Overweight	154 (35.0%)
Obese	100 (22.6%)
Blood Sugar Range	
Normal	344 (77.9%)
Prediabetes	61 (13.9%)
Diabetes	36 (08.2%)
Blood Pressure Range	
Normal	60 (13.6%)
Prehypertension	110 (24.9%)
Hypertension	271 (61.5%)

Figure 3: Table 1 :

2

Test group	Comparative group	OR	95% CI	P-value
Age ≥40	Age<40	5.0	2.2-11.2	<0.001
BMI ≥30	BMI <30	1.4	0.7-2.5	0.306
Hypertensive	Non-hypertensive	1.2	0.6-2.3	0.541
Diabetic	Non-diabetic	5.3	2.2-12.7	<0.001

Figure 4: Table 2 :

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.1 Availability of Data and Materials

The final version of data set supporting the findings of this paper may be found in the Jakaya Kikwete Cardiac Institute website (www.jkci.or.tz). The corresponding author will be more than willing to email the data set to the editorial committee whenever it's needed.

.2 Conflict of interest

The authors declare no conflict of interest to disclose.

.3 Funding

This study was funded by the Office of the District Commissioner for Kinondoni Municipal. The funder played no role in the design, analysis and

- [Krane et al. ()] , R J Krane , I Goldstein , I Saenz De Tejada , Impotence . *N Engl J Med* 1989. 321 p. .
- [Impotence ()] , Impotence . *JAMA* 1993. 270 p. .
- [Corona et al. ()] 'Aging and pathogenesis of erectile dysfunction'. G Corona , E Mannucci , R Mansani . *Int J Impot Res* 2004. 16 (5) p. .
- [Rosen ()] 'Brief male sexual function inventory for urology'. R C Rosen . *Urology* 1996. 47 (5) p. .
- [Zedan et al. ()] 'Cigarette smoking, hypertension and diabetes mellitus as risk factors for erectile dysfunction in upper Egypt'. H Zedan , A A Hareadei , A A Abd-Elseyed , Abdel-Maguid , EM . *East Med Health J* 2010. 16 p. .
- [Mannino et al. ()] 'Cigarette smoking: An independent risk factor for impotence?'. D M Mannino , R M Klevens , W D Flanders . *Am J Epidemiol* 1994. 140 p. .
- [Classification and diagnosis of diabetes. Sec. 2. In Standards of Medical Care in Diabetes-2015 Diabetes Care ()] 'Classification and diagnosis of diabetes. Sec. 2. In Standards of Medical Care in Diabetes-2015'. *Diabetes Care* 2015. American Diabetes Association. 38 p. . (Suppl. 1)
- [Rosen et al. ()] 'Development and evaluation of an abridged, 5-item version of the International Index of Erectile Function (IIEF-5) as a diagnostic tool for erectile dysfunction'. R C Rosen , J C Cappelleri , M D Smith . *Int J Impot Res* 1999. 11 p. .
- [Metro and Broderick ()] 'Diabetes and vascular impotence: does insulin dependence increase the relative severity?'. M J Metro , G A Broderick . *Int J Impot Res* 1999. 11 p. .
- [Sáenz De Tejada and Goldstein ()] 'Diabetic penile neuropathy'. I Sáenz De Tejada , I Goldstein . *Urol Clin North Am* 1988. 15 (1) p. .
- [Cappelleri et al. ()] 'Diagnostic evaluation of the erectile function domain of the International Index of Erectile Function'. J C Cappelleri , R C Rosen , M D Smith . *Urology* 1999. 54 p. .
- [Koskimaki et al. ()] 'Effect of erectile dysfunction on frequency of intercourse: a population based prevalence study in Finland'. J Koskimaki , M Hakama , H Huhtala , T L Tammela . *J Urol* 2000. 164 p. .
- [Kubin et al. ()] 'Epidemiology of erectile dysfunction'. M Kubin , G Wagner , A R Fugl-Meyer . *Int J Impot Res* 2003. 15 (1) p. .
- [Braun et al. ()] 'Epidemiology of erectile dysfunction: results of the "Cologne Male Survey". M Braun , G Wassmer , T Klotz . *Int J Impot Res* 2000. 12 p. .
- [Braun et al. ()] 'Epidemiology of erectile dysfunction: results of the "Cologne Male Survey"'. M Braun , G Wassmer , G Klotz . *Int J Impot Res* 2000. 12 p. .
- [Lewis et al. ()] 'Epidemiology/risk factors of sexual dysfunction'. R W Lewis , K S Fugl-Meyer , R Bosch . *J Sex Med* 2004. 1 (1) p. .
- [Kirby et al. ()] *Erectile dysfunction*, R Kirby , S Holmes , C Carson . 1998. Oxford: Health Press. (2nd ed)
- [Muneer et al. ()] 'Erectile Dysfunction'. A Muneer , J Kalsi , I Nazareth , M Arya . *BMJ* 2014. 348 p. 129.
- [Fedele et al. ()] 'Erectile dysfunction in diabetic subjects in Italy. Gruppo Italiano Studio Deficit Erettile nei Diabetici'. D Fedele , C Coscelli , F Santeusano . *Diabetes Care* 1998. 21 p. .
- [Chew et al. ()] 'Erectile dysfunction in general medicine practice: prevalence and clinical correlates'. K K Chew , C M Earle , B G Stuckey . *Int J Impot Res* 2000. 12 p. .
- [Mh and Wd ()] 'Erectile dysfunction in patients with diabetes'. Alexander Mh , Wd . *Hosp Med dysfunction* 1999. 60 p. .

- [Tan et al. ()] 'Erectile Dysfunction in Singapore: Prevalence and Its Associated Factors -A Population-Based Study'. J K Tan , C Y Hong , Djc Png , Lch Liew , M L Wong . *Singapore Med J* 2003. 44 (1) p. .
- [Pinnock and Marshall ()] 'Erectile dysfunction in the community: a prevalence study'. C B Pinnock , V R Marshall . *Med J Aust* 1999. 171 (7) p. .
- [Pinnock et al. ()] 'Erectile dysfunction in the community: a prevalence study'. C B Pinnock , A M Stapleton , V R Marshall . *Med J Aust* 1999. 171 (7) p. .
- [Seftel ()] 'Erectile dysfunction in the elderly; epidemiology, aetiology and approaches to treatment'. A D Seftel . *J Urol* 2003. 169 (6) p. .
- [Fedele et al. ()] 'Erectile dysfunction in type 1 and type 2 diabetics in Italy. On behalf of Gruppo Italiano Studio Deficit Erettile nei Diabetici'. D Fedele , A Bortolotti , C Coscelli . *Int J Epidemiol* 2000. 29 p. .
- [El-Sakka and Tayeb ()] 'Erectile dysfunction risk factors in non-insulin dependent diabetic Saudi patients'. A I El-Sakka , K A Tayeb . *J Urol* 2003. 169 p. .
- [Hirshkowitz et al. ()] 'Hypertension, erectile dysfunction, and occult sleep apnea'. M Hirshkowitz , I Karacan , A Gurakar . *Sleep* 1989. 12 p. .
- [Saenz De Tejada et al. ()] 'Impaired neurogenic and endotheliummediated relaxation of penile smooth muscle from diabetic men with impotence'. I Saenz De Tejada , I Goldstein , K Azadzoi , R J Krane , R A Cohen . *N Engl J Med* 1989. 320 p. .
- [Feldman et al. ()] 'Impotence and its medical and psychosocial correlates: results of the Massachusetts Male Aging Study'. H A Feldman , I Goldstein , Hatzichristou . *J Urol* 1994. 151 p. .
- [Feldman et al. ()] 'Impotence and its medical and psychosocial correlates: results of the Massachusetts Male Aging Study'. H A Feldman , I Goldstein , D G Hatzichristou . *J Urol* 1994. 151 (1) p. .
- [Kaiser and Korenman ()] 'Impotence in diabetic men'. F E Kaiser , S G Korenman . *Am J Med* 1988. 85 p. .
- [Johannes et al. ()] 'Incidence of erectile dysfunction in men 40 to 69 years old: longitudinal results from the Massachusetts male aging study'. C B Johannes , A B Araujo , C A Derby . *J Urol* 2000. 163 (2) p. .
- [Derby et al. ()] 'Modifiable risk factors and erectile dysfunction: Can lifestyle changes modify risk'. C A Derby , B A Mohr , I Goldstein , H A Feldman , C B Johannes , J B Mckinlay . *Urology* 2000. 56 p. .
- [Kayigil et al. ()] 'Multifactorial evaluation of diabetic erectile dysfunction'. O Kayigil , O Atahan , A Metin . *Int Urol Nephrol* 1996. 28 p. .
- [Sáenz De Tejada et al. ()] 'Pathophysiology of erectile dysfunction'. I Sáenz De Tejada , J Angulo , S Celtek . *J Sex Med* 2005. 2 (1) p. .
- [Physical status: the use and interpretation of anthropometry WHO Technical Report Series ()] 'Physical status: the use and interpretation of anthropometry'. *WHO Technical Report Series* 1995. World Health Organization. 854. (WHO)
- [Adebusoye et al. ()] 'Prevalence and Correlates of Erectile Dysfunction among Primary Care Clinic Attendees in Nigeria'. L A Adebusoye , O E Olapade-Olaopa , M M Ladipo , E T Owoaje . *Global Journal of Health Science* 2012. 4 (4) p. .
- [Moreira et al. ()] 'Prevalence and correlates of erectile dysfunction: results of the Brazilian study of sexual behavior'. E D Moreira , C H Abdo , E B Torres . *Urology* 2001. 58 p. .
- [Moreira et al. ()] 'Prevalence and determinants of erectile dysfunction in Santos, southeastern Brazil'. E D Moreira , W J Bestane , E B Bartolo , Jas Fittipaldi . *Sao Paulo Med. J* 2002. 120 p. .
- [Martin-Morales et al. ()] 'Prevalence and independent risk factors for erectile dysfunction in Spain: results of the Epidemiologia de la Disfuncion Erectil Masculina Study'. A Martin-Morales , J J Sanchez-Cruz , T I Saenz . *J Urol* 2001. 166 p. .
- [Ahn et al. ()] 'Prevalence and risk factors for erectile dysfunction in Korean men: results of an epidemiological study'. T Y Ahn , J K Park , S W Lee . *Int J Sex Med* 2007. 4 (5) p. .
- [Selvin et al. ()] 'Prevalence and risk factors for erectile dysfunction in the US'. E Selvin , A L Burnett , E A Platz . *Am J Med* 2007. 120 (2) p. .
- [Bai et al. (2004)] 'Prevalence and risk factors of erectile dysfunction in three cities of China: a community-based study'. Q Bai , Q Xu , H Jiang , W Zhang , X Wang , J Zhu . *Asian J Androl* 2004 Dec. 6 p. .
- [Siu et al. ()] 'Prevalence of and risk for erectile dysfunction in Hong Kong patients'. S C Siu , S K Lo , K W Wong . *Diabetes Med* 2001. 18 p. .
- [Mutagaywa et al. ()] 'Prevalence of erectile dysfunction and associated factors among diabetic men attending diabetic clinic at Muhimbili National Hospital in Dar-es-Salaam'. R K Mutagaywa , J Lutale , M Aboud , B A Kamala . *Tanzania. The Pan African Medical Journal* 2014. 17 p. 227.

- [Seyam et al. ()] 'Prevalence of erectile dysfunction and its correlates in Egypt: a community-based study'. R M Seyam , A Albakry , A Ghobish , H Arif , K Dandash , H Rashwan . *Int J Impot Res* 2003. 15 p. .
- [Berrada et al. ()] 'Prevalence of erectile dysfunction and its correlates: a population based study in Morocco'. S Berrada , N Kadri , S Mechakra-Tahari , C Nejari . *Int J Impot Res* 2003. 15 (1) p. . (Suppl)
- [Kongkanand ()] 'Prevalence of erectile dysfunction in Thailand'. A Kongkanand . *Int. J Androl* 2000. 23 (2) p. . (Suppl)
- [Kongkanand ()] 'Prevalence of erectile dysfunction in Thailand. Thai Erectile Dysfunction Epidemiological Study Group'. A Kongkanand . *Int J Androl* 2000. 23 (2) p. .
- [Prins et al. ()] 'Prevalence of erectile dysfunction: a systematic review of population-based studies'. J Prins , M H Blanker , A M Bohnen , S Thomas , JIhr Bosch . *International Journal of Impotence Research* 2002. 14 p. .
- [Klein et al. ()] 'Prevalence of selfreported erectile dysfunction in people with longterm IDDM'. R Klein , B E Klein , K E Lee . *Diabetes Care* 1996. 19 p. .
- [Berardis and Franciosi ()] 'Quality of Care and Outcomes in Type 2 Diabetes (QuED) Study Group. Erectile dysfunction and quality of life in type 2 diabetic patients: a serious problem too often overlooked'. De Berardis , G Franciosi , M . *Diabetes Care* 2002. 25 (2) p. .
- [Chobanian et al. ()] 'seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure'. A V Chobanian , G L Bakris , H R Black . *Hypertension* 2003. 42 p. .
- [Ventegodt ()] 'Sex and the quality of life in Denmark'. S Ventegodt . *Arch Sex Behav* 1998. 27 p. .
- [Khatib et al. ()] 'Sexual dysfunction among Jordanian men with diabetes'. F A Khatib , Ns , N S Shegem , A M Bateiha , R M Abu-Ali , K M Ajlouni . *Saudi Med J* 2006. 27 p. .
- [Kolodny et al. ()] 'Sexual dysfunction in diabetic men'. R C Kolodny , C B Kahn , H H Goldstein , D M Bornett . *Diabetes* 1974. 13 (4) p. .
- [Dunn et al. ()] 'Sexual problems: a study of the prevalence and need for health care in the general population'. K M Dunn , P R Croft , G I Hackett . *Fam Pract* 1998. 15 p. .
- [Cao et al. ()] 'Smoking and Risk of Erectile Dysfunction: Systematic Review of Observational Studies with Meta-Analysis'. S Cao , X Yin , Y Wang , H Zhou , F Song , Z Lu . *PLoS One* 2013. 8 (4) p. e60443.
- [Bornman and Du Plessis ()] 'Smoking and vascular impotence: A reason for concern'. M S Bornman , D J Du Plessis . *S Afr Med J* 1986. 70 p. .
- [Mcvarry et al. ()] 'Subcommittee on Smoking and Erectile Dysfunction Socioeconomic Committee, Sexual Medicine Society of North America. Smoking and erectile dysfunction: evidence based analysis'. K T Mcvarry , S Carrier , H Wessells . *J Urol* 2001. 166 p. .
- [Macdonagh et al. ()] 'The effect of erectile dysfunction on quality of life: psychometric testing of a new quality of life measure for patients with erectile dysfunction'. R Macdonagh , P Ewings , T Porter . *J Urol* 2002. 167 (1) p. .
- [Benet and Melman ()] 'The epidemiology of erectile dysfunction'. A E Benet , A Melman . *Urol Clin North Am* 1995. 22 p. .
- [Bortolotti et al. ()] 'The epidemiology of erectile dysfunction and its risk factors'. A Bortolotti , F Parazzini , E Colli , M Landoni . *Int J Androl* 1997. 20 p. .
- [Kedde et al. ()] 'The incidence of sexual dysfunction in patients attending Dutch general practitioners'. H Kedde , G Donker , P Leusink , H Kruijer . *International Journal of Sexual Health* 2011. 23 (4) p. .
- [Rosen et al. ()] 'The International Index of Erectile Function (IIEF): a multidimensional scale for assessment of erectile dysfunction'. R C Rosen , A Riley , G Wagner . *Urology* 1997. 49 (7) p. .
- [Ayta et al. ()] 'The likely worldwide increase in erectile dysfunction between 1995 and 2025 and some possible policy consequences'. I A Ayta , J B Mckinlay , R J Krane . *BJU Int* 1999. 84 (1) p. .
- [Al-Hunayan et al. ()] 'The prevalence and predictors of erectile dysfunction in men with newly diagnosed with type 2 diabetes mellitus'. A Al-Hunayan , M Al-Mutar , E O Kehinde , L Thalib , M Al-Ghorory . *BJU Int* 2007. 99 p. .
- [Mcculloch et al. ()] 'The prevalence of diabetic impotence'. D K Mcculloch , I W Campbell , Wu Fc . *Diabetologia* 1980. 18 p. .
- [Lockhat et al.] 'The prevalence of erectile dysfunction at a primary healthcare clinic in Durban'. Y Lockhat , A Ross , P Ramlachan , C Rangiah . *South African Family Practice* 55 (3) p. .
- [Mckinlay et al. ()] 'The questionable physiologic and epidemiologic bases for a male climacteric syndrome: preliminary results from Massachusetts Male Aging Study'. J B Mckinlay , C Longcope , A Gary . *Maturitas* 1989. 11 p. .

8 AUTHORS CONTRIBUTIONS

- 317 [Rosen and Cappelleri ()] ‘The sexual health inventory for men (IIEF-5)’. R C Rosen , J C Cappelleri . *Int J*
318 *Impot Res* 2000. 12 p. .
- 319 [Wei et al. ()] ‘Total cholesterol and high density lipoprotein cholesterol as important predictors of erectile
320 dysfunction’. M Wei , C A Macera , D R Davis . *Am J Epidemiol* 1994. 140 p. .
- 321 [Jevtich et al. ()] ‘Vascular factor in erectile failure among diabetics’. M J Jevtich , M Edson , W D Jarman , H
322 H Herrera . *Urology* 1982. 19 p. .