Review Article

A critical look at descriptive epidemiology of sexual dysfunction in Asia compared to the rest of the world - a call for evidence-based data

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Abstract: Recently evidence-based medicine has been applied to comparative epidemiological papers regarding sexual dysfunction that have appeared in the literature. This review is intended to focus the readers on a validated and standardized methodological evidence-based process for preparing such articles. It reviews four key articles that have been published in the English language that have obtained a high evidence-based score for reliability that have included descriptive epidemiology of sexual dysfunctions in men and women in Asia compared to the rest of the world. These four papers are analyzed in detail in order to provide stress of what constitutes evidence-based studies in descriptive epidemiology for sexual function. As can be seen there has not yet been a perfect article that compares the prevalence of sexual function in Asia compared to the rest of the world since there are key methodological problems in the collection of the data. In addition, there is a paucity of incidence studies for sexual dysfunction in Asian populations. The readers are encouraged to use this data in preparation of future descriptive epidemiological studies that involve Asian countries.

Key Words: Descriptive epidemiology; sexual dysfunction; Asia sexual function

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Introduction

Epidemiological data are the basis for assessing the impact of a condition in a given society. It is important that epidemiological studies are reasonably valid, and particularly that they cover representative samples. Heterogeneity in the literature means that we are often unable to disentangle true population affects from differences in reported prevalence that are simply due to inconsistent use of definitions and differences in survey methods. Epidemiology is divided into descriptive and analytical epidemiology. This paper will deal with a critical look at the need for evidence-based descriptive epidemiology. Descriptive studies are primarily prevalence and incidence studies. Prevalence characterizes the proportion of a given population that at a given time has a condition. Incidence is defined as a number of new cases with a certain condition during a specific time period in relation to the size of the population studied. Populations for these studies are from communities or clinics. Analytical studies deal with risk factors and association of the sexual dysfunction with these risks.

The purpose of this paper is twofold. The first is to define what constitutes evidence-based studies in descriptive epidemiological studies on sexual function. The second is to analyze the best evidenced-based epidemiological incidence and prevalence studies performed in Asia compared to the other areas of the world published in the English language. For the first point of this paper attention is called to the use of a classification system proposed by Prins *et al.* in 2002 that provides a 15 points scale to be used to establish the validity of such a study (1). For the second goal the purpose of this article is not to be a comprehensive report of all descriptive epidemiology regarding sexual function that have occurred in Asia and have been reported in the English literature. This article instead will critically analyze a limited number of studies that have a high Prins score

in order to attempt to provide a framework for building evidence based descriptive epidemiological reports on sexual function from Asia. Readers are referred to more detailed previously reported studies that are more comprehensive about epidemiological studies of sexual function involving Asia (2-4).

A systematic evidence based tool for descriptive epidemiological studies

Specifically, the Prins (1) methodological quality assessments for prevalent studies consist of 6 points for external validity criteria which consist of the following:

(I) 1 point for the study period specified;
(II) 1 point for the source population described, random *vs.* study group that covers the complete population;
(III) 2 points for eligibility criteria that includes specific age groups with inclusion and exclusion criteria specified;
(IV) 1 point for description of the study population, i.e., characteristics of the group and;
(V) 1 point for a description of participants and non-responders requiring a response rate of greater than 70% or enough data on the non-responders to make inferences on the representative nature of the responders.

External validity relates to the applicability of study results to other populations.

There are 6 points that can be collected for internal validity criteria and consist of the following:

(I) Data collection being prospective providing 1 point;
(II) The measurement instrument being validated and the period covered by it specified providing 2 points;
(III) A clear definition of the dysfunction stated provides 1 point and;
(IV) Reported prevalence by age and gender specificity and possible disease correlations providing 2 points.

Internal validity implies accurate measurement apart from random error.

Informativity provides 3 points by providing information on the method of data collection, with question and answer possibility stated and an evaluation of whether the reported prevalence rates are reproducible. Most of the studies covered in this article deal primarily with ED but when applicable other sexual dysfunctions are included in the description.

Results

The first published comparative Asian epidemiological study in the English literature that tried to compare data to another region of the world came from Japan and was reported in 1999 with a Prins score of 10 (5). This was a sister study to an American study published on an analysis of a population in Olmstead County from Mayo Clinic in Rochester, Minnesota, that was published in 1995 (6). The definition of ED in this study was the ability to have erection when stimulated within the previous six months from none or little of the time representing two of six categories reported. This was a community survey with this single asked question of all men in a small fishing village surveyed with 289 responding (46.8%) and 42.3% analyzed. The age of the participants was 40-47 years old with 61% of this population greater than 60 years of age. The respondents had to have no prostate or bladder cancer, no neurogenic bladder, and no history of CVA or having any anti-androgens as therapy. This small population was compared to 2115 from Olmstead County with a 55% respondent rate. The prevalence rate for ED for 40-49 years old was 15% (47 men) in Japan *vs.* 1% (788 men) in the American study. It was 23% for 50-59 years old in Japan (65 men) *vs.* 6% (597 men) in the Olmstead County study. Similarly, incidence of ED was higher in the Japanese study compared to the American study for 60-69 years old with a prevalence of 39% (107 men) *vs.* 22% (418 men) and 71% for men 70-79 years of age (70 men) *vs.* 44% (234 men). Erectile dysfunction and decreased sexual libido were more frequently reported by Japanese men compared to American men but worry and concern showed no striking difference between the studies. Differences between the two cultures in perception of aging or adaptation of lifestyles with aging, and differences in perceptions of sexual function and its importance as well as differences in willingness to report sexual problems may partially explain the difference in prevalence rates reported. Similarly, differences in medications, diet, alcohol consumption and lifestyle habits were not controlled for the two studies.

The first English literature published so-called worldwide epidemiological studies in the English literature that included Asian countries came from Nicolosi *et al.* in 2003 and was given a Prins score of 11 (7). This was a random population sample of 40-70 years old householders using a single question defining ED as focusing on responses of "sometimes (moderate ED) or never (severe ED) able to maintain an erection to complete sexual intercourse". Responses of "always" and "usually" were not considered for definition of ED. Men were considered sexually active if they reported having sexual intercourse or masturbation at

Table 1 Age-standardized prevalence of sexual dysfunctions by country cluster for sexually active subjects (8). Data presented as percentage, with 95% confidence intervals in parentheses

Sexual dysfunction	Northern Europe	Southern Europe	Non-European West	Central/South America	Middle East	East Asia	South East Asia	Total
Men								
Early ejaculation	10 [9-11]	13 [12-15]	16 [14-17]	22 [19-25]	8 [7-9]	19 [17-21]	25 [22-29]	14 [14-15]
Erection difficulties	8 [7-9]	8 [7-9]	11 [10-13]	9 [6-11]	8 [6-10]	15[13-17]	22 [18-25]	10 [9-10]
Lack of interest in sex	7 [6-8]	6 [5-7]	9 [8-11]	9 [7-11]	13[11-15]	12[11-14]	20 [17-23]	9 [9-10]
Inability for orgasm	5 [4-6]	7 [6-8]	8 [7-9]	8 [6-11]	7 [6-9]	10 [9-12]	15 [13-18]	7 [7-8]
Sex not pleasurable	4 [3-5]	5 [4-6]	6 [5-7]	4 [3-6]	8 [6-10]	7 [6-8]	12 [10-15]	6 [5-6]
Women								
Lack of interest in sex	17 [15-19]	21 [19-23]	19 [17-21]	20 [16-24]	29 [24-34]	27 [25-30]	34 [28-39]	21 [20-22]
Inability for orgasm	10 [9-12]	17 [15-19]	16 [14-17]	16 [13-19]	17 [12-21]	23 [21-26]	34 [29-39]	16 [15-17]
Lubrication difficulties	13 [11-14]	12 [10-14]	19 [17-21]	18 [15-22]	12 [8-16]	28 [25-30]	28 [23-33]	16 [15-16]
Sex not pleasurable	10 [8-11]	15 [13-17]	12 [10-14]	14 [11-17]	22 [17-26]	21 [17-24]	28 [23-33]	15 [14-15]
Painful intercourse	5 [4-7]	8 [7-10]	8 [7-9]	14 [11-17]	14 [10-19]	20 [18-23]	22 [17-27]	10 [10-11]

least once in the preceding 6 months. Random population samples with data from this single asked question were collected by telephone in Italy, interviews in person in Brazil, by telephone and/or in person in Malaysia, and self-administered questionnaires in Japan.

Response rate varied greatly from the four regions with 92% in Brazil, 72% in Italy, 51% in Japan, and only 16% in Malaysia. 2,417 men answered the ED question, approximately 600 from each country. Prevalence rates for ED were reported as follows: 15.5% in Brazil, 17.2% in Italy, 34.5% in Japan, and 22.4% in Malaysia. The risk increased by 10% per year of age. Although the prevalence of ED varied among countries an analysis of age patterns and association with background disease and behavior were very similar between the populations. The age-adjusted prevalence of the demographic, social, medical and life-style characteristics (with the exception of the proportion of single men) were different in the four countries with at least one country different from the others. The differences in prevalence of ED may reflect cultural differences in the perception of, attitudes toward, and willingness to report ED (7).

The second published worldwide epidemiologic studies in the English literature to include Asian countries with a Prins score of 11 was published by Nicolosi in 2004 (8). This report came from the study entitled the Global Study of Sexual Attitudes and Behaviors (GSSAB). The presence of sexual problems in men and women were assessed using the question, "During the last 12 months have you ever experienced the dysfunction for a period of two months or more." For all sexual dysfunctions answers indicating "occasionally" were excluded as defining the disorder but answers of "sometimes" and "frequently" did. Sexual activity was defined as at least one episode of intercourse during the previous year. The definition of ED in this study was trouble in achieving or maintaining erection for a period of two months or more during the previous year. Early ejaculations are also self-reported in this survey. This was a random population study of 40-80 years old in 29 countries, mostly by telephone interviews but mix of telephone and in person interviews used in Mexico, and door to door interviews in the Mideast and South Africa. Intercept methods were used in Asia except in Japan where questionnaires were sent to randomly selected people from a national telephone database. Thus there was some question whether this was truly a sample of the entire population. Results were divided into reportable regions that consisted of seven different areas: Northern Europe, Southern Europe, Non-European West, Central and South America, Middle East, East Asia (China, Hong Kong, Korea, Taiwan), and Southeast Asia (Malaysia, Philippines, Singapore, Thailand). The Indian subcontinent was not represented. This report was based upon 13,618 men and 13,882 women with the age range of 40-80 years which represented 19% of the total sampled group.

See *Table 1* for the age-standardized results for sexual dysfunctions by country cluster (8). Premature ejaculation was the most commonly reported sexual dysfunction in men and was more frequently reported in the Asian, Central/South America, and Non-European Western clusters. See

Tables 2,3 for the results of prevalence data for ED. Overall 28% of men reported at least one of the sexual disorders but the proportion was highest in Asia. Lack of sexual interest was the most common problem in women with greatest rates in South East Asia and the Middle East clusters. The inability to reach orgasm and lubrication problems were the second most frequent problems in women with the greatest prevalence in Asia. Overall 39% of women reported at least one dysfunction with greater proportions in Asia and the Middle East clusters.

Table 2 Erectile dysfunction over the age of 40 - a global study of sexual attitudes and behaviors (7) - Prevalence of ED for the entire study

Age range	Prevalence rate
40-49 years old	5%
50-59 years old	9%
60-69 years old	15%
70-80 years old	22%
Entire study	10%

Table 3 Erectile dysfunction over the age of 40 - a global study of sexual attitudes and behaviors (7) - Prevalence of ED for different regions

Region	Prevalence percent
Northern Europe	8%
Southern Europe	8%
Non-European West	11%
Central/South America	9%
Middle East	8%
East Asia	15%
Southeast Asia	22%
Entire study	10%

A more detailed report from the GSSAB was reported in 2005 with a Prins score of 14 (9). This was a restricted analysis of data to those 11,205 men and 9,000 women who had intercourse at least once in the past year and thus had a tendency to under- represent older respondents. Intercept and door to door methods of collection of data was more reflective of urban populations and were thus used in East Asia, Southeast Asia, South Africa and Middle Eastern regions. Respondents reported on how often they thought about sex which became a proxy for sexual libido and whether they agreed with the belief that aging reduced sexual desire and/or behavior. Sample size varied greatly. In Korea a sample size of 1,200 men and women were used. In Japan 1,500 men and women were reported on and in China, Hong Kong, Taiwan, Indonesia, Malaysia, Philippines, Singapore, and Thailand 500 men and women were used for analysis. Countries with covariance patterns that were significantly different from pool samples were dropped from the analysis. So Taiwan, Indonesia, Philippines, and Singapore were Asian countries dropped from the analysis for orgasm problems; Taiwan and Philippines from analysis for lubrications problems; Korea, Malaysia, Philippines and Singapore from evaluation of early ejaculations; and Korea, Malaysia and Thailand eliminated for reporting on ED.

See *Tables 4,5* for prevalence rates from this study for sexual problems in women and men (9). In most cases, the prevalence for sexual problems was higher in East Asia and South East Asia than other cluster regions of the world. This paper more thoroughly analyzed factors associated with the likelihood of reporting sexual problems among men and women in four categories: women's inability to reach orgasm and lubrication difficulties and men's early ejaculation and erectile difficulties. For erectile difficulties aging increased reporting of this problem as well as a

Table 4 Prevalence of women's sexual problems by region and severity (periodically and frequently) (9)

	Lack of sexual interest	Inability to reach orgasm	Orgasm too quickly	Pain during sex	Sex not pleasurable	Lubrication difficulties
Northern Europe	16.8	10.4	3.9	5.5	9.7	12.6
Southern Europe	21	16.8	7.1	8.5	15.1	12.2
Non-European West	19.6	15.7	6.2	8.1	12.2	18.7
Central/South America	20.2	15.8	13.4	14	14	18.2
Middle East	29.2	16.9	6.2	14.4	21.8	12.3
East Asia	27.4	23.2	11.3	20.4	21.1	27.7
Southeast Asia	33.8	33.9	19.7	22.5	27.6	27.8

Table 5 Prevalence of men's sexual problems by region and severity (periodically and frequently) (9)

	Lack of sexual interest	Inability to each orgasm	Early ejaculation	Pain during sex	Sex not pleasurable	Erectile difficulties
Northern Europe	6.9	5.2	10.5	1.5	4.4	8.2
Southern Europe	6.4	6.8	13.3	2.3	5.1	8
Non-European West	9.5	8.1	15.7	1.7	6.3	11.2
Central/South America	8.9	8.6	21.9	3.4	4.5	8.7
Middle East	12.8	7.5	8.6	7.4	8.2	8.4
East Asia	12.1	10.5	19.4	2.9	7	15.3
Southeast Asia	20.3	15.4	25.2	8	12.4	21.8

history of vascular condition and prostate disease. Financial problems and history of depression elevated the likelihood of reporting erectile difficulties. Infrequent sex in men and those in uncommitted relationships tend to experience sexual dysfunctions more often. This study did demonstrate aging effects are more relevant for men than women.

Several weaknesses in this study were reported by the authors which included self-reports of sexual and health conditions were more likely to underestimate the true prevalence of sexual dysfunction in these societies (9). Subjects may not be aware, may not recall, or may choose not to disclose that he/she have the problem/condition. The authors enumerated five methodological issues including: (I) differences in recruitment of samples and administration of surveys across countries; (II) challenges associated with achieving accurate, valid translations of the survey instrument in multiple languages to ensure the comparability of questions and responses; (III) the adequacy of pooling diverse population samples into regional clusters that are sufficiently homogeneous for comparative statistical analysis; (IV) variation in the quality of the country-specific survey organizations across the 29 countries; and (V) the attainment of modes response rates.

There is a paucity of Asian studies for incidence for all sexual dysfunctions. There have been only four evidenced-based studies reporting incidence of ED that have emanated from the United States, Netherlands, Brazil, and Finland (10-13). Ages studied range from 40-78 years of age with a study period for incidence data varying from 2-8.8 years. Response rates varied from 46-92%. Accrued incidence rates from these four studies were 26-66 cases per thousand man-years. Incidence increased with age in all studies. The incidence for ED was more in the minimal category than the severe. In the Netherland study the same population was followed over two periods at 2 and 4 years. There was less incidence by half in the longer study indicating that a longer period of evaluation for populations might give a truer incidence for ED in a society. Erectile dysfunction incidence was higher for men with lower education, diabetes, treated heart disease, treated hypertension, depression and benign prostatic hyperplasia.

Discussion

In general one can see the problems of trying to compare prevalence rates for sexual dysfunction among different regions of the world is extremely difficult. In analysis of previous published detailed reports on the international consultation for sexual dysfunction (2,3) the following observations can be made. Prevalence rates for sexual dysfunction vary immensely because of different ages reported, different age composition of the studies, different percentage of responders, different time periods asked about, different definitions of ED used, and different strategies of collecting data (telephone interviews, mail questionnaires, in office questionnaires, face to face interviews-single question *vs.* multiple *vs.* scales). However general observations can be made. Erectile dysfunction increased with each decade of life in all studies. Asian studies showed a prevalence of 7-15% for ages 40-49 and 39-49% for ages 60-70. Australian studies showed prevalence for ED for 5-6% for ages 40-49 and 12-13% for ages 50-59. European studies were hard to compare but roughly lower values for the total groups reported, 3-5% for those less than 49 year of age with the most wide different of rates in those 50-59 years. After 60-65 years of age there began to be an increase in double-digit percentages of the prevalence of ED and even greater values at age 70 and above, increasing to 40-50% for prevalence of ED and even higher. Latin Americans reports vary greatly as well but greater

than age 60 increased the prevalence of ED to 40-50%. North American studies had similar marked increases again occurring at 60 years of age. The world studies compared to Asia showed a trend for higher rates in Asia and also in the United States.

In the four studies presented in this paper there are certainly methodological problems in the assumption that these prevalence rates of ED and other sexual problems in men and women can be compared among the different countries. In the first study comparing ED prevalence in a small Japanese fishing village to a medically sophisticated county in the USA, although similar data collecting tools were used it is obvious that the comparisons lack merit. The other 3 so-called world studies which included cluster areas in Asia emanated from the same survey, the GSAAB, only the last paper introduced sound methodological connections for co-variance factors but still the authors listed well documented problems in interpreting the data as truly comparative as discussed in the results section.

Although for the most part these studies show higher prevalence for sexual dysfunctions in Asia compared to the rest of the world, there may be significant methodological problems in collection of the data as discussed above. In addition, the differences in cultural adaptation to and understanding of sexual problems have not really been explored. Although some attempts have been made to compare certain health and disease risk factors between the countries this effort has been rather weak. Other social factors such as the nature of the environment, such as crowded households being shared with several generations of occupants, may even play a role in explaining some of the differences observed between countries in the prevalence of sexual disorders. Future efforts to characterize sexual dysfunction in Asia should be mindful of these weaknesses and try to use more validated and standardized methods and tools when surveying communities particularly if one of the aims is to compare rates between countries.

Summary

In general the purpose of this paper was to highlight the paucity of high evidenced based epidemiological literature regarding sexual dysfunction emanating from Asia. It was the attempt of this author to highlight high quality evidence based literature which has included Asian data in an attempt to encourage scientists and epidemiologists in the Asian countries to use these evidenced based criteria to develop a description of the prevalence of sexual dysfunction in their societies. One improvement for defining and quantifying the sexual dysfunction could be using validated and standardized questionnaire tools such as the International Index of Erectile Function (IIEF) in men and the Female Sexual Function Index (FSFI) in women (14,15). Extremely useful would be true incidence studies since that seems to be virtually lacking as published in the English literature from Asian studies.

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