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Health promotion and prevention of bowel disorders through toilet designs: A myth or reality?

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Abstract:

Now, lifestyle diseases are quite common globally. The risk factors of lifestyle diseases such as sedentary habits, lack of physical exercise, and lack of fiber result in the development of noncommunicable diseases. However, when the point of discussion slightly shifted toward toilet habits, it is always seems to be a secret affair. In fact, the discussion of defecation-related matter openly is considered a taboo. This is not uncommon even in medical fraternity. In fact, during the early 1980s, some researches on the association between the diarrhea prevalence, open-air defecation, and latrine use rate were documented. However, nobody acknowledges it socially desirable, now, to discuss defecation-related issues. The public health experts completely ignored the discussion of ill-effects of the use of pedestal latrine on human health. It is evident from scientific studies over a period, that many of the abdominal disorders of the human due change in his toilet habits from a squatting-to-sitting posture using a pedestal latrine. That disease correlation was ignored at that time. The increase in disease burden is due to nonmaintaining the ergonomic design during the construction of this kind of toilets. Squatting posture for the defecation is the most appropriate way, as in this case, abdominal muscles work actively and complete evacuation takes place. To conclude, the time has come to reacquaint people with their natural habits and put this unfortunate experiment to an end.

Keywords:

Defecation, health promotion, pedestal toilet, squatting, toilet

Introduction

Now, lifestyle diseases are quite common globally and a hot topic of discussion and research among public health researchers. Mostly, such discussion-rotated around on risk factors of lifestyle diseases such as sedentary habits, lack of physical exercise, fast foods, and lack of fiber in the diet. Later, it resulted in the occurrence of noncommunicable diseases such as cardiovascular diseases, diabetes, and obesity.^[1] In general discussions, nonacademic such topics are common, and sometimes people discuss this issue openly such as “the cerebral stroke” suffered by their “relatives” or about the “last stage cervical

cancer” faced courageously by their “aunts.” However, when the point of discussion slightly shifted toward toilet habits, it is always seems to be a secret affair. In fact, the discussion of defecation-related matter openly is considered a taboo.^[2]

This is not uncommon even in public health community in medical colleges of India, where, during 1960s–1970s, debates/discussions on latrines, water seal, and methods of refuse disposal was in vogue. In fact, during the 1970s and early 1980s, some researches on the association between the diarrhea prevalence, open-air defecation, and latrine use rate were documented.^[3] However, nobody acknowledges it socially desirable, now, to discuss defecation-related issues. Sadly, despite the recent emphasis on “Public

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Health" in these departments, the research and discussion on latrines do not find priority. Instead, they have usually limited themselves in heated debates on *P* value, health economics, universal health coverage etc. It is not surprising; that the public health experts completely ignored the discussion of ill-effects of the use of pedestal latrine on the human health.

It is evident from scientific studies over a period, that many of the abdominal disorders (gastrointestinal diseases such as hemorrhoids, ulcerative colitis, irritable bowel syndrome, and colon cancer) of the human due change in his toilet habits from a squatting-to-sitting posture using a pedestal latrine. These diseases are quite common in developed countries. The disease prevalence is higher among the urban people of South Africa, compared to the rural people with a traditional lifestyle.^[4]

Materials and Methods

The current paper aimed at comparing the two types of toilet designs and literature search was done using PubMed, Google scholar, and Scopus databases for the key terms "toilet designs," "pedestal latrine," "squatting posture," and/or bowel disorders. All the relevant articles were included to support the argument for this narrative review.

Results

Historically, in Britain royal families and the disabled only used the chair-like toilets. However, later, the practice spread to the common people. For rest of the globe, pedestal toilets denoted, yet an additional symbol of British supremacy. The general impression was the British were successful in improving the "primitive" cultural practices by advocating the pedestal toilets which was followed by the common people in the third world. Hence, within a few decades, most of the industrialized world, for example, Europe, Canada, and United States adopted pedestal toilets—"The Emperor's New Throne."^[5,6]

Scientists observed in the late nineteenth century, the sudden emergence of pelvic diseases which was correlated with the change of toilet habits. That disease correlation was ignored at that time. Many scientists rejected the hypothesis, which change in the defecation posture can cause bowel diseases.^[6] In fact, from the early days of civilization, human has continuously used squatting position to defecate. Even, children of every civilization automatically learn squatting for defecation. Human body was designed to function by this natural posture.^[6]

In India also, it continued till 1980s. With the fast pace of globalization, people have changed their language, dress, food, and even changed their toilet habits also! It has been witnessed in Indian cities in the last two decades, that, pedestal toilet construction took the shape of an epidemic. Whether it is in public or private building, pedestal toilets are constructed without considering the adverse health consequences.^[7]

Ergonomic design was not maintained during the construction of this kind of toilets which may be due to a communication gap between the designers/manufacturers of pedestal toilets and the medical knowledge-related to the human physiology or anatomy.^[8]

It is evident from the study that defecation by sitting position is a not only difficult process but also it is incomplete one and against nonconsonance with the human physiology and anatomy. This process compels one to exert strain on evacuation. On the traditional pedestal toilet, the intra-abdominal pressure is exerted by pushing the diaphragm down resulted in relaxed abdominal muscle and dysfunctional ileocecal valve. As a consequence of unsupported abdominal muscles, our body suffers later.

Squatting posture for the defecation is the most appropriate way, as in this case, abdominal muscles work actively and complete evacuation takes place as shown in Figure 1. There are some health benefits described in the literature.^[6]

Advantages of squatting

- It makes evacuation faster and more convenient
- It prevents "fecal stagnation," a causative factor for irritable bowel syndrome, inflammatory bowel disease, and appendicitis even colon cancer
- It guards the pelvic nerves from becoming stretched

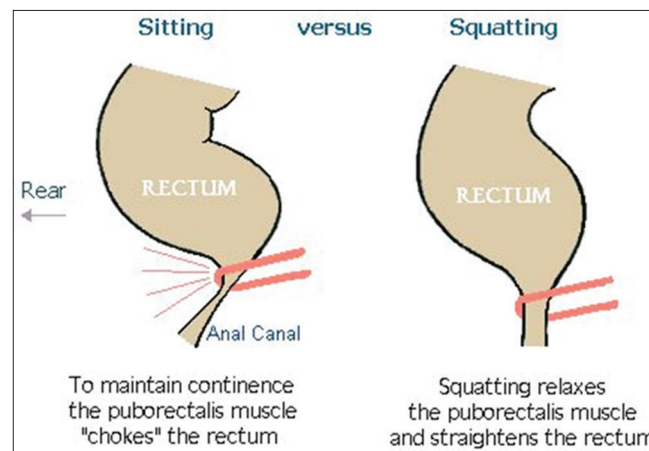


Figure 1: Comparison of sitting versus squatting positions. Source: Image credit www.Relfe.com

and damaged which control the urogenital organs such as prostate, bladder, and uterus

- It blocks the ileocecal valve temporarily, between the colon and the small intestine, and hence, there is a minimal or no chance of contaminating the small intestine
- It maintains continence by relaxing the puborectalis muscle (which usually chokes the rectum)
- The colon is supported by the thighs which prevent straining which, in turn, prevent hernias and pelvic organ prolapse
- It is a strongly recommended noninvasive treatment in the case of hemorrhoids
- Squatting is also useful for pregnant females by avoiding the pressure exerted on the uterus when using the toilet
- Regular squatting is beneficial for natural delivery.

In fact, it is mentioned in the scientific literature that there may be a relation between the development of hemorrhoids with defecation pattern. The clinicians often advised to the patients suffering from hemorrhoids is to squat for bowel evacuation regularly. Due to the straightening of the anorectal angle during squatting, it reduces the defecation time (i.e., 1 min as compared to 4–15 min in the sitting position) and frequency of straining episodes. Thus, allows smooth evacuation of feces with minimum straining effort.^[9,10] It is also evident that diseases such as hemorrhoids are very uncommon in countries where people squat for defecation, although a causal relationship has not fully established. Majority of our population belong from rural areas, where the predominant mode of defecation still is squatting. In the Indian cities, sitting type of latrine seats is now dominating. Unfortunately, the pedestal latrines installed in public toilets are not found in usable condition due to mishandling. Sometimes, the seat is broken or soiled by urine, even toilet papers are usually missing.^[11] Moreover, due to cultural lag, we are still not comfortable with the total package deal, that is, proper use of Western latrine. In fact, not much homework was done for installing pedestal toilets everywhere in India. Biologically, the consistency of fecal matter in India is different as compared to the Westerners, that small volume and hard consistency of fecal matter (due to cold weather) allows the appropriate use of napkin. Even otherwise, chemical-containing toilet papers can create trouble in the piles patients.^[12]

Dr. Bernard Cohen, the director of pediatric dermatology at Johns Hopkins Children's Center, and colleagues expressed his concern about developing toilet seat dermatitis to the children. Even, they offered some tips to avoid toilet seat dermatitis (Johns Hopkins Children's Center, News Release, January 25, 2010).^[13]

Discussion

In fact, many people are very shy of their defecation habits. Hence, they prefer their latrines to follow to their culture. For example, traditional squat toilets are well-matched for Indians because of their sense of hygiene and cultural acceptance than pedestal latrines. In this context, it is difficult for people when they are forced to change their defecation habits. Sometimes, defecation-related factors do not remain in their control, for example, it is difficult to get a room with squatting type of latrine in big hotels. Most Indians prefer to wash their bottoms after defecation which is sometimes not possible with the "Western" latrines. As there may not any provision for that except using tissue paper.^[14]

Moreover, during the menstruation, pedestal latrines are inconvenient to use for females. Despite numerous medical advantages of squatting, culturally also, squat toilets do suit the Indian people. Further, this has been compared in a tabular form [Tables 1 and 2].

Apart from toilet habits, the pedestal design also affects the women's health. Pelvic floor injury due to the stretching of nerves is the most important cause of the pelvic disease, which affects women more commonly. One probable mechanism is that the gap in the vaginal canal is more prone to stress when women use the sitting toilet. The pressure created by the diaphragm during the defecation and apparent relaxation of abdominal muscles in the sitting toilet pushed pelvic organs into this gap. These results in hernias and other complications such as, uterine prolapse, cystocele, rectocele, and enterocele.^[15]

In a broad sense, they are termed as "pelvic organ prolapse." During later pregnancy and childbirth, the risks of prolapse increase at that time because gravid uterus put extra force to that gap during the defecation in a sitting toilet. Henceforth, the pedestal toilet is to be held responsible again, because it has desalinated women from the natural birthing posture. Simply squatting virtually eliminates the need for the high pressure as it fully opens the birth canal. Surprisingly, clinicians as well as by common women labeled uterine prolapse as a part of an unavoidable set of disorders. This "Unavoidable" ailment means income, so clinicians are reluctant to initiate any promotive health strategies to prevent this "female troubles." It is also due to huge amounts of their income are at risk, creating an apparent conflict of interest. Fortunately, some clinicians have a more ideological perspective, as they are strongly advocating the squatting posture/squatting exercise for strengthening pelvic floor muscles to prevent

Table 1: Comparison of defecation process in squatting and pedestal type of latrines

Steps in defecation and associated factors	Type of latrine	
	Squatting	Pedestal
Enter the latrine/bolt the door/undo cord/belt/zipper; pull down Pyjama/salwar/trousers/underwear etc., till knee (or pull-up skirt/saree) Pull down latrine seat	Common	Common
Sit/squat	Bottom/thighs do not touch the seat/foot rest Posture-thighs press on abdomen-helpful in defecation (studies on ano- rectal angle etc.) No problem in winters Inconvenient/cold in winter	Required – user has to touch the seat (? unhygienic) which may be soiled Especially public toilets Bottom - thighs touch the seat, which may be soiled (unhygienic) Thighs do not touch on the abdomen does not help in defecation? Results in constipation? hemorrhoids Inconvenient/cold in winter Clothes may touch the sides of toilet seats? Unhygienic
Defecation process	Fecal matter drops in the pan and slides down to the hole, which is narrow, deep and located at the rear end of the pan. Level of water is relatively lower in the hole. Less or no splashing of dirty water to bottom/back of thighs when fecal mass drops in water	More of splashing of dirty water on bottom or back of thighs as fecal matter drops on the water level, which is located relatively higher, more anteriorly and has a wider surface area
Pull-up seat	Not required	Needed. Again has to touch the seat cover which may be unhygienic
Wash your bottom/ablution (or use toilet paper	Washing done on the squat plate itself without getting up. Wash water falls down in pan itself and is drained away with feces	Washing has to be done on the floor. For this, there may not be enough space, particularly in latrines in public places. If it is a combined latrine/bathroom washing on the floor will soiled the floor (and even the footwear) Note: As per our Indian mindset, most people prefer to wash their bottom even after using the toilet paper
Flushing of toilets	Usually easier	Often flushing is not complete in single act. Some fecal matter usually remain visible on/in water (water tank design problem)
Get up	Same (later after washing)	Same
When flush does not work (which is quite common in Indian set up)	Flushing of feces is usually easier One can just hurl half a bucket of water to flush the feces down the pan hole	Using bucket flushing in high (pedestal) latrine is not practical (and is unhygienic)- water may splash on the floor or yourself (soiling)
Wash your hands/tie/pyjama/ underwear/salwar/cord/unbolt/get out	Common	Common

any prolapse. Many physicians have worried about the harm caused by their contemporaries in performing needless surgery. Te Linde stated in his book (Textbook on Gynecological Surgery) “-In the practice of gynecology, one has ample opportunity to observe countless women who have been advised to have hysterectomies without proper indications. I am inclined to believe that the greatest single factor in promoting unnecessary hysterectomy is a lack of understanding of gynecologic pathology.”^[16] Almost every clinician advocates squatting as the most natural way for defecation. A study was conducted by Alexander Kira, Professor of Architecture at Cornell University regarding the design of the modern toilet and also advocated the same.^[17]

The design of the pedestal toilet is an example of absolute neglect of human anatomy. From the last centuries, people from developed countries were compelled to adopt pedestal toilets, while the others (“control group”) used the squatting toilets.

Although the results of this unintentional experiment have been clear and unambiguous. As a result, the experimental group has suffered dramatically higher rates of intestinal and urological disorders. Unfortunately, the findings were misinterpreted by the Western scientists, and they blamed on the bad food habits, that is, “using a highly refined diet.” Despite their deliberate efforts, they have persistently failed to show the association between the changing

Table 2: Other differences between squatting and pedestal latrines

Aspects	Latrine type	
	Squatting type	Pedestal type
Suits our culture/habits	Yes	No
Squatting is a natural posture for defecation	Yes	Sitting for defecation is not a natural posture
Difficulties/inconvenience for children	Less	More
Convenience for handicapped/arthritis cases	Less	More
Amenability for proper hygienic maintenance in public places (cinema hall/train)	Better	Poor
Likelihood of soiling of seat in public places	Less	More
Inconvenience for urination – particularly for women getting clothes soiled	Less chances (convenient)	More chances (inconvenient)
Inconvenience for females during menstruation	Less	More
Chances of soiling of seat by improper use, for example, when males urinate in the pot without lifting the seat	Less	More (seat soiled by urine. Not hygienic for use by others later)

diet pattern and increase the incidence of bowel disorders.^[18]

Conclusions

Although the medical scientists have been working meticulously to solve these disease mysteries, their progress is not satisfactory enough. Their isolated clinical research has failed to perceive a notable coincidence. Why so many different uncommon bowel diseases suddenly became common in the late nineteenth century? What was a common change in the daily habits of the population? The answer is not very difficult to tell: People changed their squatting posture for routine bodily functions (including childbirth.) The detail anatomical relevance of this change has been explained before. The relevance is also confirmed by the lower incidence of these disorders among the squatting populations.

To conclude, the porcelain throne has caused unnecessary suffering to many. It also wasted billions of dollars of the countries as health-care costs. The time has come to reacquaint people with their natural habits and put this unfortunate experiment to an end.

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Conflicts of interest

There are no conflicts of interest.

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