Risks of Disposable Menstrual Products and a Shift Toward Sustainable Periods

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Menstruation, as a process, is a regular hormonal cycle in which the endometrium of the uterus is shed and expelled through the vagina as blood. The more colloquial term for menstruation is a period. Menstruation is an important part in the lives of all persons with a uterus; however, an aspect of menstruation that has become even more important than the period itself is the management of menstruation. The modern menstruator has a plethora of options to choose from when curating an effective period management system: there are products designed to absorb the period blood and be thrown away after use; there are products designed to be inserted into the vagina to hold period blood and be emptied every few hours; there are even absorbent underwear that can be worn throughout the day and washed like regular undergarments. The two most popular options in the United States are disposable sanitary pads and tampons. My personal period management system consists of both disposable pads and tampons, which I have been using every month for over ten years. As my understanding of periods, public health, and environmental health has developed over the years, I have truly started to understand how influential access to period products is when it comes to the physical health and well-being of menstruators. My pursuit of knowledge in global health has also enlightened me to the freedom and independence that is associated with access to menstrual products.

More recently my social media has been flooded with content about the urgent call to action for all menstruators to switch from traditional menstrual products (disposable pads and tampons) to more sustainable alternatives. The various videos, advertisements, and galleries I was seeing on a near daily basis had me wondering what are the impacts of disposable period products. Are they bad for my physical health? Are they bad for the environment? How much waste is being produced by menstruators and is this waste significant? I wanted to understand why menstrual sustainability has become the primary focus of young menstruators and emerging period product companies in the United States.

To give more historical background to the consumption and risks posed by modern menstrual products I think it is important to look into the beginning of feminine hygiene products and the culture surrounding periods. As a society, we as Americans have severely stigmatized menstruation; and as a result, stigmatized women (Brink, 2015). The beliefs regarding periods as being unclean and unsightly date all the way back to the ancient Grecians who believed period blood was an evil humor that needed to be expelled to maintain health and well-being (Borunda, 2019). The culture around menstruation was the primary motivation for innovation in period management (Borunda, 2019).

Prior to the start of the twentieth century, disposable pads and tampons did not exist. The most commonplace practice for period management was the use of regular cloth to absorb the blood and be washed and reused as needed by the menstruator. The two companies at the forefront of menstrual innovation were Kotex and Sfag-Na-Kins (Smithsonian, 2021). Sfag-Na-Kins designed a disposable pad made from sphagnum moss native to the Pacific Northwest, specifically, Portland. The sphagnum moss was wrapped in gauze and packaged in a small box. Sfag-Na-Kins made many claims about the potential benefits of the moss itself, but this product was never very successful with women. Kotex, on the other hand, created a product that incorporated modified bandages from the first World War and Cellucotton– a wood pulp with similar texture and absorbance as cotton (Smithsonian, 2021). The Kotex pads found much greater success, and in the 1920s they were sold in pharmacies across the country as well as in mail order catalogs. The origin of menstrual tampons is slightly less clear compared to pads. Some of the first iterations of tampons were used to mitigate bleeding in deep wounds of the body. There were also medicated tampons, which introduced medicine to the body through the vagina (Smithsonian, 2021). In the year 1931 it is believed that E.C. Haas designed the tampon similar to the tampons we use today (Borunda, 2019). This product would later become the very well known Tampax tampon with a paper tube applicator and a cotton sponge. The emergence and immense popularity of both sanitary pads and tampons led to the broader development of feminine hygiene products. What was once limited to just pads and tampons in the early twentieth century has now exploded into a 15 billion dollar annual market (Smithsonian, 2021).

Following the 1930s, the use of disposable menstrual products was officially cementented into the period management of nearly every American menstruator. Disposable pads and tampons created an environment in which both menstruators and the corporations manufacturing menstrual products could thrive. Women had more independence in their home and workplace now that their periods could be carried out in a discrete and hygienic fashion, and corporations had a guaranteed demand for their products that would exist as long as periods exist (Borunda, 2019). Menstrual products developed with American society. As our country began to incorporate plastics into more and more of our daily lives, period products followed suit. During the 1970s various companies began using plastics to make pads adhere to undergarments and tampon applicators easier to insert. Plastic was also used to individually wrap each pad and each tampon to keep them sterile but portable. The introduction of plastics into menstrual products improved the consumer experience immensely (Borunda, 2019). American menstruators of the late twentieth century finally had period products that were widely available, comfortable and discrete, and easy to use and dispose of. However, the positive attitude surrounding modern menstrual products with large amounts of plastics has changed dramatically as menstruators have become more concerned with their period’s impact on the environment.

What are the concerns regarding the effects of plastics on the environment? The primary concern in the discussion of plastic in the environment is the extended period of time it takes for plastic to fully degrade. The complete degradation of plastic from its physical form into its chemical components takes over 500 years with some longer estimates reaching 800 years (Borunda, 2019). Because plastic takes so long to degrade in the environment it poses serious risks as a physical pollutant. Large amounts of plastic exist in landfills, bodies of freshwater, and the ocean (Knoblauch, 2022). The presence of plastic in the ocean is particularly problematic as it can destroy large areas of delicate habitats for marine life, cause physical harm to various aquatic animals, and smaller plastics are easily ingested which results in the poisoning of ocean dwellers (Iberdrola, 2022). The flow of ocean currents has even created dense islands of plastic. The largest island of plastic lives in the Pacific ocean between California and Hawaii. The island measures three times the size of France and is comprised of over one billion pieces of plastic. This one island is responsible for the death of over 100,000 marine animals each year (Iberdrola, 2022).

Beyond the extremely lengthy degradation period for plastics, there are concerns for the effects of the chemical components found in plastics as they break down. Plastics are made from various chemical compounds that each pose a unique risk to the environment. Some of the more common plastics used in everyday items include Bisphenol A (BPA) and phthalates (United Nations Environment Programme, 2021). Both are known to cause damage to the hormonal systems of vertebrates and invertebrates that consume or inhale these plasticizers. Some of their known effects include breast cancer, infertility, endometriosis, and polycystic ovary syndrome (PCOS) (Yang et al., 2011). From an environmental perspective phthalates and BPA have created a loss in biodiversity in terrestrial and aquatic environments; additionally, such plasticizers have also been found to alter gene expression and behavior of fish in fisheries (UNEP, 2021).

Phthalates and BPA along with polyester, rayon, and polyethylene are used in both pads and tampons (Borunda, 2019). Polyester and rayon are both forms of plastic fibers that are regularly used in the production of fabrics and clothing. Polyester is a non-biodegradable plastic, and the manufacturing produces greenhouse emissions significantly more harmful than carbon dioxide (Issi, 2022). Rayon is a plant based plastic fiber that contributes to deforestation and requires the use of harmful chemicals during processing (Issi, 2022). Polyethylene is most often used in packaging and is also used to make the plastic bags used in many grocery stores across the country. In period products, polyethylene is used as the backing and adhesive in disposable pads (Borunda, 2019). The chemical decomposition of polyethylene is toxic to any organism that absorbs or consumes the substance through water (UNEP, 2019). With pads being 90% plastic and tampons being 6% (not including the wrapper or the applicator), it is understandable why both products are seen as a threat to the environment (Notman, 2021).

The threat posed by both disposable pads and tampons is also magnified when factoring in the number of pads and tampons used throughout the entire menstrual life of every woman in the country. As of 2019, there were 166.7 million women in the United States. The average menstruator uses and disposes of 22 menstrual products (combination of both pads and tampons) per cycle with about 13 cycles per year (Wen, 2018). This equates to over 47.6 billion menstrual products being used and disposed of per year in the United States alone. Each menstruator, on average, experiences their period for 38 years. It is clear to see that plastic waste created by period products is a significant contributor to the harmful effects of plastic in our environment.

The health risks of disposable period products are not limited to the environment. The two most pressing human health concerns posed by menstrual products are Toxic Shock Syndrome (TSS) and exposure to harmful chemicals used during processing and manufacturing. TSS is defined by the Center for Disease Control (CDC) in a clinical case as a patient with a fever of 102 degrees or higher, rash, peeling or flaking skin, and hypotension. A slightly broader definition is an illness of multiple systems of the body (Nicole, 2014). TSS is caused by the bacteria *Staphylococcus aureus* and is linked to the use of tampons. This illness can cause severe bodily harm and even death. There is still much about TSS that is unknown as far as its relationship to tampons; however, it is understood that wearing a tampon for extended periods of time can increase the risk of TSS infection. The emergence of TSS in tampon users came with the increased use of synthetic materials in tampons in the 1980s (Nicole, 2014). Such synthetic materials, like rayon, are more absorbent than cotton alone. Because tampons became more absorbent, users began changing their tampons less frequently. While tampons absorb menstrual blood within the vagina, they also introduce and maintain bacteria. This is why increased absorbance and infrequent changing of tampons resulted in the rise of TSS cases. Though TSS is not very common, between 30-70% of menstruators who experience TSS die from the infection (Centers for Disease Control, 2020).

In addition to serious bacterial infections, menstruators have become increasingly concerned with the chemicals used during processing and manufacturing for tampons and pads. When harsh and toxic chemicals are used to bleach the cotton and synthetic materials used in period products, it begs the question, are menstruators at an increased risk of exposure to dangerous toxins? The most threatening of the potential chemical exposures associated with menstrual products is dioxins. Dioxins are defined as by-products of industrial manufacturing processes (United States Environmental Protection Agency, 2022). In the case of menstrual products, dioxins are found in trace amounts in pads and tampons as a result of wood pulp bleaching (DeVito and Schecter, 2002). Dioxin exposure can result in very serious health complications including cancer, damage to the immune system, disruptions in the hormonal system, as well as developmental and reproductive issues (USEPA, 2022). A 2002 study investigated the presence of dioxins in various brands of tampons. Different strains of dioxins were found across more than six brands of tampons; however, the amount of dioxin in a single tampon was found to be negligible as far as health risks were concerned (DeVito and Schecter, 2002). But, is any amount of such a toxic substance truly negligible? Especially when we are considering the number of tampons the average menstruator used in their lifetime, which is approximately 11,400 (Nicole, 2014). Small exposures over time, especially in such an absorbent and vascular tissue like that of the vagina, may accumulate and create health problems.

Now that the environmental and health risks of disposable tampons and pads have been established, what are the alternatives and what role does sustainability play in the future of menstrual products? Despite what sustainability looks like in other fields, with cutting edge technology and new age production/manufacturing practices, menstrual sustainability is looking to the past for impactful solutions. The resurgence of menstrual cups as a sustainable solution as well as reusable tampon applicators draws its inspiration from the early twentieth century century. Even menstrual underwear, or “period panties,” as well as reusable pads reference the absorbent cloths used by women preceding the invention of pads or tampons in the nineteenth century. These products have been updated in regards to the materials used to make such commodities; to improve the user experience and efficacy (Borunda, 2019).

These sustainable options for period products have existed for as long, if not longer than disposable menstrual products, so why are people beginning to make the switch from disposable to sustainable? Gen-Z has made solving the climate crisis facing our planet their primary concern. Young people around the world, as they come to be consumers, are doing their part to shop ethically and sustainably (Makhijani, 2022). Period products are no exception. With the colossal health and environmental threats posed by plastics, young menstruators are looking to mitigate their contributions to environmental plastic as much as possible (Makhijani, 2022). As more and more menstruators are seeking out sustainable period solutions, such products are becoming more easily and readily available both online and in stores.

In closing, I have come to have a greater understanding of the serious environmental and health risks posed by disposable menstrual products as well as an appreciation for the efforts of the sustainable period movement. I think it is also important to highlight the simplicity of sustainable menstrual product solutions. It is not often that we as a society return to old practices, especially where health and hygiene are concerned, but it seems historic period management practices can do more for the future of our planet than modern menstrual products. Of course, no solution is perfect. Sustainable period products are becoming more accessible, but require a larger investment than their disposable counterparts. Not all menstruators are financially able to utilize sustainable products, which characterizes the universal experience of consumers in capitalist markets (Makhijani, 2022). People want to purchase ethically and environmentally conscious, but the high cost of ethical goods limits the people who are able to purchase sustainably. While sustainability in menstrual products is still developing, I want to emphasize the importance of making necessities like period products as safely, sustainably, and widely available as possible.

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