



## Critical Dialogue on the Role of Clothing Care Label for Controlling Microfiber Pollution

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Microfiber, a synthetic fiber less than 5mm in length, is one of the major reasons for environmental pollution. It is becoming a global concern for marine and terrestrial environments, estimating around 5 trillion individual pieces of microfibers are floating on the surface of world's oceans, which are weighing around 269,000 tons (Eriksen et al., 2014; Geyer et al., 2017). One of the major sources of microfibers is clothing made of synthetic materials such as polyester, nylon, and acrylic (Carr, 2017). Synthetic clothing sheds thousands of microfibers during the home laundering process (Hernandez et al., 2017; Napper & Thompson, 2016). These are too tiny to trap into the filter of a home laundering machine, eventually flowing out with rinse waters and entering to oceans (Dris et al., 2016). Ocean species (e.g., fish, plankton) consume microfibers, which ultimately disturb food chains and health of marine lives (Napper & Thompson, 2016). Microfibers have been detected in human lung biopsies, lakes, drinking waters, and soil samples (Machado et al., 2018; Prata, 2018; Wagner et al., 2014). For the betterment of people and the planet, it is urged to think about the way to minimize microfibers' entrances to the nature. One way of this effort can be to control microfibers' shedding during the laundering process; here, consumers' knowledge and awareness plays an important role.

As of now, are consumers fully aware of microfibers' shedding during the laundering process, which causes ocean pollution? What information is currently available in clothing care label? In our knowledge, existing clothing care label does not provide any instruction about how to launder clothing to minimize microfibers' shedding. This fact may lead consumers' unawareness of the negative environmental impact they are unconsciously contributing by laundering synthetic clothing they wear in their life. Limited studies are currently available to critically discuss this topic in the textiles and clothing discipline. Thus, the purpose of this conceptual study was to provide a critical dialogue about the role of clothing care label for controlling microfiber pollution reflecting McDonough and Braungart's (2002) cradle to cradle process model. In doing such, we clarify this initial discussion in two steps: (a) current practices of clothing care label and (b) needs to include the microfiber care instruction within clothing care label.

For consumers, the easiest way to get product care information is through care label, which provides critical information such as fiber contents and washing instructions. This information guides consumers to properly use and handle it (Shin, 2000). Care label indeed plays a crucial role when brands communicate with consumers. In U.S., textiles and clothing manufacturers or importers need to follow the care-labelling rule which is enforced by the Federal Trade Commission (FTC). In care label, washing instructions include the following five elements: washing by hand or machine, bleaching, drying, ironing, and warning. These washing

instruction elements have been prepared only to guide consumers for properly caring their clothing in order to minimize any harm to clothing during the laundering process (FTC, 2014). This current care labelling rule does not reflect the negative environmental impact of microfibers' shedding during the laundering process of synthetic clothing. A gap exists here between the current care labelling rule and the world's current movement of environmental consciousness, for example, microfiber pollution occurring in marine and terrestrial environments. When laundering synthetic clothing followed by the current care instruction, consumers may unintentionally harm the environment by releasing microfibers into the water system. This process is against the closed-loop system that McDonough and Braungart (2002) argue within their cradle to cradle process model.

Within McDonough and Braungart's (2002) cradle to cradle approach, materials continuously circulate as pure and valuable sources within the closed-loop system, which is the opposition of a traditional one-way cradle to grave model where post-used materials turn into wastes and create pollution. They categorize materials into two ways: biological and technical nutrients. The first, biological nutrients, is made from natural materials that can easily re-enter into the nature after the use without harming the environment, for example, natural fibers such as cotton, wool, and silk. The latter, technical nutrients, is man-made materials that are designed to be continuously captured within the closed-loop system; for example, synthetic materials such as polyester, nylon, and acrylic can be considered as technical nutrients when they are recycled or reused.

The current laundering process of synthetic clothing is comparable to one-way cradle to grave approach, where post-used materials such as microfibers turn into pollutants and become a global concern of ocean pollution for the environment. Are consumers aware of the fact that synthetic clothing they wear contain microfibers, these shed during the laundering process and flow into the water system, and this unsustainable practice then lead to ocean pollution and eventually impact to the health of people and the planet? This is the time for us to revisit the existing care labelling rule that is designed for only maintaining clothing quality without considering negative impacts that may cause to the environment. By providing microfiber containment of synthetic clothing and its appropriate washing instruction within clothing care label, consumers' knowledge about microfibers and awareness about controlling microfiber pollution may be increased. Thus, clothing care label can play a fundamental role to change agents, here consumers, for controlling microfiber pollution, which eventually may turn the current one-way cradle to grave system into the cradle to cradle closed-loop system. Various stakeholders (e.g., industry partners, consumers, government agencies) need to be proactive to listen this critical voice on how to control microfiber pollution by proposing an effective washing instruction in clothing care label and offering a realistic action plan of this change. This is the critical call for the textiles and clothing field and our current society where we live in.

Microfibers' adverse effect on the environment is well documented, where synthetic clothing is one of the major sources of microfiber pollution through the home laundering process. Here, consumers can play a vital role to minimize microfiber pollution by being aware of microfiber-contained synthetic clothing they wear and following the laundering instruction of

microfiber-contained synthetic clothing. Disclosure of the microfiber information and appropriate washing instruction within clothing care label will enhance consumers' knowledge and awareness of microfibers that currently cause huge environmental pollution. In addition, this dialogue provides some insights for textiles and clothing manufactures being responsible to use quality synthetic fibers for clothing production. This conceptual study contributes to bridge the gap between consumers' awareness of microfiber pollution caused by synthetic clothing they wear and current clothing care label that does not include the proper care instruction of microfiber-contained synthetic clothing. Clothing care label needs to contain its care instruction in an inclusive manner, sustaining both clothing quality and the environment. This conceptual study initiated a platform for critical dialogue under this emerging topic and raise opportunity for academic and industry professionals in a textiles and clothing discipline to dive into further investigation.

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