


A User-Centred Design Support Framework to Develop Aesthetically Pleasing and Sustainable Over-the-Counter Pharmaceutical Packaging

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Abstract

Stakeholders consider aesthetics and sustainability as important aspects of over-the-counter pharmaceutical (OTCP) packaging, and studies show that their interests should be represented more. To address this, a framework which supports designers to develop aesthetically pleasing sustainable OTCP packaging was generated, keeping at its core the stakeholders. The requirements were identified, leading to the architecture development and implementation in a prototype tool. Results provide a degree of evidence that the framework contributes to a user-centred design approach for OTCP packaging.

Keywords: design support system, packaging, sustainability

1. Introduction

People make use of over-the-counter pharmaceuticals (OTCP) to treat minor ailments, such as pain relief and common cold treatments. While packaging's main function is protection, there are opportunities to adopt sustainable practices. Sustainable design aims to reduce the negative impacts on the three pillars of sustainability: environment, economy, and society. With the healthcare industry moving towards self-medication (Kauppinen-Räsänen, 2011), there is an increase in self-service pharmacies and groceries stocking OTCP products (Gauld *et al.*, 2015; Martins *et al.*, 2016). For this reason, shelf appeal is important in OTCP packaging, to attract the consumer's attention. The complexity of OTCP packaging design is increasing with growing competition and the constant push for sustainability.

A study conducted by (More and Srivastava, 2010) gathered data from pharmacists who stated that consumers remember the aesthetic attributes of OTCP products the most. Another study conducted by (Kauppinen-Raisanen and Luomala, 2010) explored the preferences of packaging colours of painkillers and sore throat medicine. They also suggest that colour plays a role in communication, where colours evoke expectations about pharmaceutical trustworthiness. The effectiveness of packaging is dependent on the consumer's level of involvement at the point of purchase (Petty and Cacioppo, 1986). This describes the effort that the consumer makes to search for information regarding a product (Petty and Cacioppo, 1986). Low involvement products are low in price, emotional value, and risk factor (Clement *et al.*, 2015). There is also a greater chance of impulse buying. While generic pharmaceuticals may be low in price, there is a high risk factor since they are related to health (Kauppinen-Räsänen, 2011). A study conducted by (Gore *et al.*, 1994) concluded that consumers have a high level of involvement when purchasing OTCP products, since they search for information about the product, and evaluate between OTCP brands. Since consumers are responsible for decisions about use of OTCP medications, such as appropriate doses regimens, they look for information about the OTCP product on the packaging.

Therefore, the packaging's aesthetic attributes act as a means of communicating information about the OTC product, and to differentiate against competing products.

An extensive literature review indicates that there is a gap in investigating the aesthetics and sustainability aspects when designing OTC packaging. To address this gap, the overall aim of this study is to generate knowledge to the research objective: *'To develop a framework to design aesthetically pleasing sustainable over-the-counter pharmaceutical packaging and evaluate it.'*

The study conducted to address this research objective adapts the Design Thinking (Norman, 2016) approach throughout the solution phase of the methodology proposed by (Duffy and Donnell, 1998). Design Thinking was adopted to understand the stakeholders' requirements, as it focuses on human centred design. Studies show that stakeholder needs should be better represented from the early stages (Gottfridsson, 2008) of the design process of OTC packaging (Lorenzini et al., 2017; Ward et al., 2010). The main stakeholders throughout OTC packaging's life cycle are the consumers who purchase OTCs, the pharmacists who dispense the OTC, and the designer who would design OTC packaging. Based upon this introduction, the rest of this paper is structured as follows. Section 2 identifies the necessary requirements for a design framework to support the design of aesthetics and sustainability in OTC packaging. Section 3 reviews related work of sustainable packaging design support systems. Section 4 investigates any issues for consumers and pharmacists which relate to OTC packaging. Section 5 defines ASSIST-OTCP framework, whilst Section 6 evaluates a prototype computer-based tool implementation of the framework. Sections 7 and 8 discuss and conclude the results respectively.

2. Identifying the Requirements for the Design Support Framework

The aim of the first study was to identify the framework requirements to support sustainability and aesthetic design characteristics in OTC packaging. Semi-structured interviews were conducted with eight OTC packaging development stakeholders, three female and five male. Five of the participants were Maltese while the others were from other countries (the Netherlands, India, and England). They had range of two to twenty-five years of experience in handling OTC packaging. A good mix of design experience was achieved, despite the small sample size. While this sample size is small compared those in quantitative research, various authors (Boyd, 2001; Creswell, 1998; Morse, 1994) agree that sample sizes of between five and ten participants is sufficient to reach saturation. Although the data collected from a small sample size cannot be easily generalised, the depth achieved leads to a more complex internal consistency (Fischer, 2006). With permission obtained from the participants, the interviews were recorded and transcribed to identify themes, through a thematic analysis using *QSR International's NVivo 12* software (QSRInternational, 2018). The Intercoder Reliability analysis resulted in an average Cohen's kappa score of 0.71, which was adequate given the substantial agreement between the codes (Landis and Koch, 1977). Each interview lasted approximately an hour on average.

Some insights on important characteristics in OTC packaging design was also gathered. The participants claimed to hardly consider sustainability, saying that *"there is not much knowledge"* on sustainable practices in OTC packaging. All participants agreed that recycling blisters is difficult, saying that *"Pharmaceutical packaging is always a big challenge to recycle"*. The participants noted that the OTC packaging industry has strict requirements on hygiene, artwork and manufacturing. Cost was determined to be the biggest constraint. It was also concluded that shelf appeal is important, but less than in other sectors, such as in food packaging. All participants agreed that they would use such a framework if it would guide them to consider aesthetics and sustainability in their design practice.

The results indicated that a framework would be useful as early as the task clarification stage of the design process. It should make designers aware of standards to observe, and take packaging on the market as case studies in evaluations. The framework should also suggest aesthetic qualities (e.g. colour) depending on the target audience (e.g. tablets for older adults). Finally, it must be computer-based, and focus on both the design and optimisation of new and existing primary and secondary packaging.

3. Review of Sustainable Packaging Design Support Systems

A literature review was conducted to evaluate trends in the design support for sustainable packaging. A set of references concerning design systems was created to define the literature search. Searches

were conducted using Google, Google Scholar, Academia, and Design Society. The terms “Pharmaceutical packaging” were searched with terms such as “sustainable design tool” and “design support system”. The search was restricted to studies in English, within a 10-year time frame from 2011 onwards. In total, three design support systems were reviewed. While there are various design support systems for other types of packaging, this study focuses on those which specifically manage pharmaceutical packaging.

PharmaSC (Halim *et al.*, 2019) is a computer-based tool which minimises the cost and greenhouse gas emissions throughout the supply chain of pharmaceuticals. Packaging is considered, but this tool is used to support the sustainable manufacturing of pharmaceuticals. This tool is used to design new products, when the framework should be used to also optimise existing packaging.

The computer-based tool developed by (Johnson&Johnson, 2008) evaluates environmental impacts of new packaging designs, during the material selection activity in the embodiment stage of the design process. The tool informs designers of regulatory requirements based on packaging performance.

The paper-based design guidelines described in (van Soest-Segers and Haffmans, 2019) aim to give an overview of the sustainability aspects (prevention, reduction, recyclability, and material selection) when designing pharmaceutical packaging. The guidelines optimise new concepts in the embodiment stage.

The design support systems for packaging in other industries provide valuable insights. However, OTCP packaging has additional requirements over typical packaging. The interviews with the OTCP packaging development stakeholders (Section 2), revealed the importance of following hygiene, artwork, and manufacturing standards throughout the packaging production process. They also mentioned that packaging from other industries is more easily recycled, and requires more shelf appeal. This indicates that design systems for other types of packaging are not appropriate to support the design of OTCP packaging. Out of the design support systems reviewed, only the aforementioned three contend specifically with pharmaceutical packaging. Two of systems support the design of pharmaceutical packaging, and neither of which are used during the task clarification stage. A design support system for OTCP packaging should ideally be used to both design and optimise new and existing packaging, during the task clarification stage, as supported by the results of the study in Section 2. It should also be noted that none of the three pharmaceutical design support systems address the aesthetic attributes or stakeholder requirements. The above review provides a degree of evidence that there is a research gap in the development of a framework aimed to be used during task clarification and which supports designers to consider sustainability and aesthetics in over-the-counter pharmaceutical packaging.

4. Investigating Issues Related to OTCP Packaging

Designers must communicate with the intended end-users, to understand how the product is expected to satisfy their needs. Therefore, this study aims to understand what stakeholders require from OTCP packaging. Questionnaires were conducted with consumers and pharmacists. The reliability and validity of the surveys were analysed, using *IBM Statistical Package for Social Sciences* software (IBMCorp, 2017). This resulted in an average Person's coefficient of 0.984 and 0.868, and Cronbach's alpha score of 0.903 and 0.986 for the consumers' and pharmacists' surveys respectively. Pilot tests were conducted with 14 consumers and 10 pharmacists. The outcome of the pilot study proved that the proposed instrument was appropriate. A sample size of 102 consumers and 48 pharmacists was achieved in the main study. The participants were approached in pharmacies room during pharmacy opening hours to participate. Each survey lasted approximately 15 minutes.

The consumers were asked about their basic demographics; age, gender, level of education, and location of residency. They were then asked for their OTCP packaging preferences, such as how likely they are to use a QR code to obtain directions on medication use. The third question asked the participants to rank packaging characteristics based on their perceived importance. The fourth question required the participant to rank various packaging materials according to their perceived sustainability. The participants were then shown three prototypes of branded (Panadol®) and generic packaging, each in the original brand's colour (blue), and green and carton, both of which are typically associated with sustainability. The consumer's emotions were measured using PrEmo cards, developed by (Laurans and Desmet, 2012). The pharmacists' survey asked for their information concerning their

demographics and to rank their preferences for sustainable practices relating to their practices. The knowledge gained from both surveys was used as a basis throughout the framework, and are described in the subsequent sections.

5. ASSIST-OTCPP: Stakeholder Focus Design for Aesthetically Pleasing and Sustainable OTCP Packaging Framework and Tool

A design support system guides the decision maker by improving the quality of their knowledge. As this framework should be used during the task clarification stage, it must guide the OTCP packaging designer when formulating a problem statement in terms of the market needs, aesthetic and sustainability demands, and consumers' technical requirements (Pahl *et al.*, 2007).

5.1. Framework Architecture

Figure 1 presents the conceptual structure of the ASSIST-OTCPP Framework. A prototype computer-based tool was implemented to evaluate the framework against its objectives, to guide designers during when considering aesthetics and sustainability during OTCP packaging design.

At Stage 1, the designer receives a product proposal, which gives the OTCP tablet specifications and target consumer demographics. If the framework is used for optimisation, then the current packaging specifications are also inputted. These are the outputs of Stage 1, and used as a basis of the framework. Stage 2 gives an environmental and aesthetic analysis, and lists the applicable standards, where:

1. Stage 2a gives an environmental and cost analysis of possible alternatives of packaging systems, with respect to each other and to existing packaging on the market;
2. Stage 2b analyses aesthetic attributes, comparing OTCP packaging being sold on the market;
3. Stage 2c presents OTCP packaging standards to the user, categorised into the life cycle stages.

The overall output of Stage 2 translates the previous three steps in indications on how to design for sustainability and aesthetics, while considering standards which the packaging must meet, throughout its life cycle. At Stage 3 the designer uses a Quality Function Deployment table, where the output is the ranking of engineering characteristics with respect to stakeholder requirements.

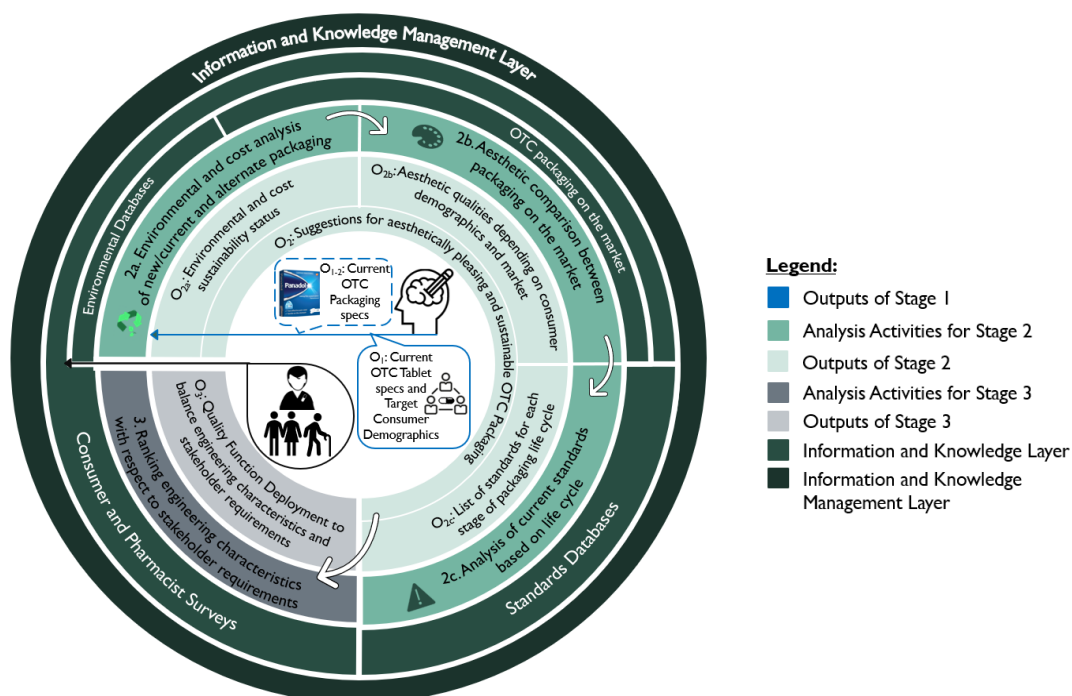


Figure 1. ASSIST-OTCPP Framework

To illustrate ASSIST-OTCPP a fictitious case study is employed. A company produces “OTCP X”, a women's health multivitamin tablet. The OTCP packaging designer is tasked with optimising the current

packaging for sustainability, while maintaining the aesthetic and functional requirements. The tablets are sold in North America in a push-through blister pack with perforations. The designer starts by inputting the target consumer demographics (gender is female, age is general, level of education is general, and market is North America), and the tablet and current packaging specifications into the tool.

The first section of Stage 2a of ASSIST-OTCPP depicted in Figure 1, is labelled as (1) in the prototype tool implementation illustrated in Figure 2. This section analyses the environmental impacts and cost of different packaging solutions for the same amount of tablets per pack. The masses of the following packaging solutions of different materials are calculated, based on the tablet specifications:

- Blister packs with different opening mechanisms. The type of opening mechanism impacts the types of materials used and the dimensions of the blister pack, as the distance between each tablet cavity increases with perforations.
- Bottles of different materials (plastic, bio-plastic, and glass), with a variety of cap materials (plastic, bio-plastic, and metal). The bottles can also have a carton box as a form of secondary packaging.

Section (1) of Figure 2 shows the carbon footprint comparison of the push through blister pack with and without perforations, and the plastic bottle with the cap combinations. The users can also compare the embodied energy, price, volume and weight with respect to 1g of tablet, and the weight of easily recyclable packaging. The information used from sustainability databases for this section are the price, and the embodied energy and carbon footprint during the primary production, manufacturing, and recycling stages per kilogram of the raw material. The system calculates and compares the volume and weight with respect to 1g of tablet, based on the tablet specifications. This gives an indication of the impacts of the packaging during transportation. The graph is normalised with respect to the current packaging, in this case the push-through blister pack with perforations.

Section (2) of Stage 2a (Figure 2) uses the target consumer demographics inputted in Stage 1 to compare the perceived sustainability of packaging materials, using knowledge generated from the consumers' surveys in Section 4. Consumers base their perception of the packaging's environmental status on its material (Steenis *et al.*, 2017). This aims to inform the designer on the packaging's sustainability in terms of the metrics in Section (1), and consumer preconceptions. In this case, a bio-plastic bottle is perceived as the most sustainable, with blister packs ranking in fifth out of seven. Section (3) of Stage 2a (see Figure 2) shows the energy use by the manufacturing processes for packaging components. Section (4) compares the weight and volume per 1g of tablet of the current packaging solution with other packaging configurations on the market of the same type, based on a database that was created with the weight and dimensions of bottles and blister packs. The final part of Stage 2a shows end-of-life routes of packaging materials, for the market in which the product is sold. This will give the user an indication of how likely it is that the consumer will recycle the packaging components. In this case study, paper packaging in North America have an approximately 80% chance of being recycled.

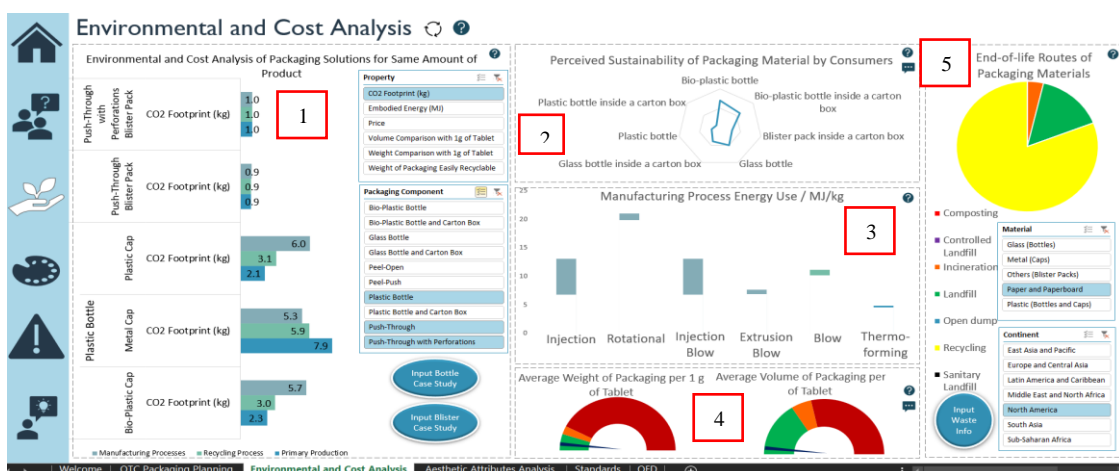


Figure 2. Screenshot of Stage 2a of the prototype tool, with the five sections highlighted

Stage 2b of ASSIST-OTCPP focuses on aesthetic attributes of OTCP packaging, as can be seen in its tool implementation in Figure 3. Section (1) of Stage 2b compares colours and type of OTCP packages currently on the market, depending on the type of pharmaceutical product (refer to Figure 3). This was based on OTCP packs sold in different markets. Women's health tablets sold in North America are typically sold in plastic bottles with plastic caps, with the main colours being purple, orange, or silver. The most common colours which are present on purple packaging are white, yellow, and black. Section (2) shows the emotions elicited when consumers are presented with packaging of the current brand colour, and carton-based and green alternatives, by means of a radar chart (see Figure 3). This knowledge was also generated as part of the consumers' study (Section 4). Section (3) of Stage 2b represents the results from the same study, which shows that consumers of the demographics inputted at Stage 1 of the tool, prefer informational leaflets and pictures over QR codes.

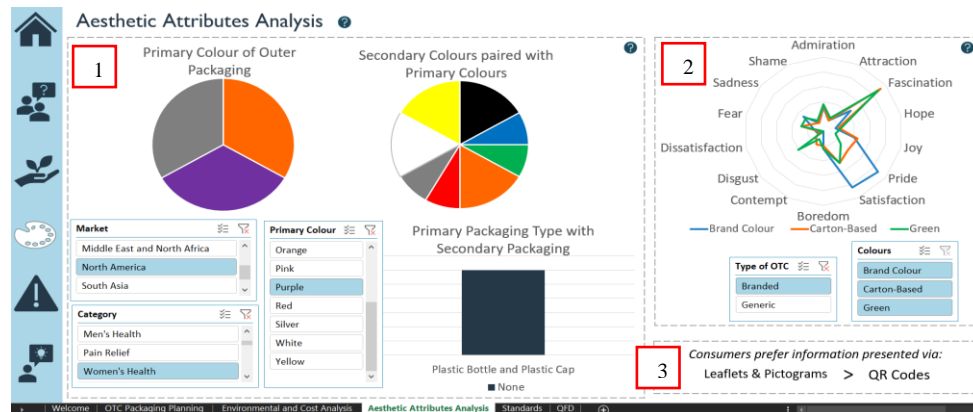


Figure 3. Screenshot of Stage 2b of the prototype tool, with the three sections highlighted

Stage 2c of the framework and prototype tool lists the relevant standards concerning the life cycle stages of the packaging. These are the standards related to the determination of the functional characteristics, testing of packaging materials, filling and assembly, sterilisation, printing and labelling, and end-of-life.

Stage 3 of the ASSIST-OTCPP framework implementation presents the designer a Quality Function Deployment (QFD) table (see Figure 4). This is a consumer driven approach used in the task clarification stage to translate the consumer requirements into engineering characteristics of the product (Pahl *et al.*, 2007). The consumer requirements are based on the studies with consumers and pharmacists described in Section 4. The engineering characteristics were formed from the thematic analysis of the interviews with OTCP packaging development stakeholders in Section 2.

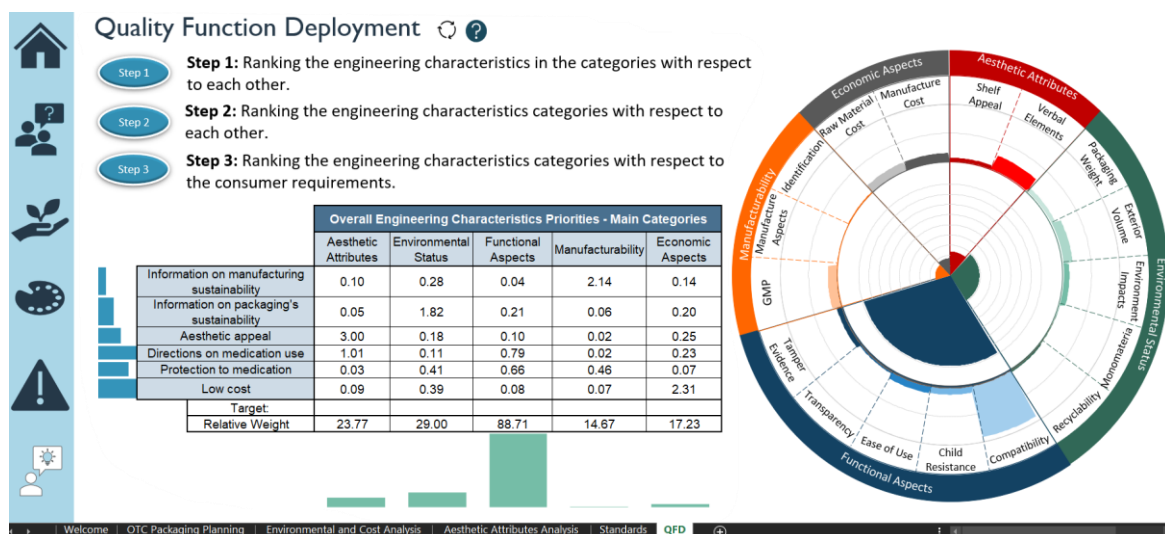


Figure 4. Screenshot of Stage 3 of the prototype tool

The Analytic Network Process (ANP) is an algorithm used in multi-criteria decision analysis, where the dependence of elements are analysed. This process enables the interrelationships of criteria to be considered. ANP is typically used with QFD (Asadabadi, 2017; Fargnoli and Haber, 2019; Tavana *et al.*, 2017) to establish the relationships between engineering characteristics themselves, and with consumer requirements. The buttons showing the steps in Figure 4 allow the user to rank the engineering characteristics main and sub-categories between themselves, and with consumer requirements. This is achieved using the (Saaty, 1980) scale, ranking categories from 1, of equal importance, to 9, of extreme importance, as required for ANP.

6. Evaluation of ASSIST-OTCPP

The objective of this study was to validate and verify ASSIST-OTCPP. Semi-structured interviews were conducted with eight designers, three female and five male, having a range of one to 18 years of experience in handling OTCP packaging. Four participants were Maltese while the other half were from other countries (the Netherlands, America, and England). Five of the OTCP packaging development stakeholders from the study reported in Section 2 participated in the evaluation, as well as independent reviewers who are new to the framework. This ensures that the evaluation of the knowledge base is more objective. Each interview lasted approximately an hour and a half on average. Questions were developed by consulting a range of established usability questionnaires (Brooke, 1986; Davis, 1989; Lewis, 1995). The system usability was measured using a questionnaire, at the end of the interviews.

A pilot study was conducted with two participants, to identify any weaknesses in the data collection instrument. Some questions were rewritten after the pilot study as they needed clarification and restructuring. The semi-structured interviews were recorded, with permission from the participants, and subsequently transcribed in order to conduct a thematic analysis aimed at identifying patterns across a set of data, using *QSR International's NVivo 12* software (QSRInternational, 2018). The Inter-coder Reliability analysis resulted in an average Cohen's kappa score of 0.64. Following the interpretation by (Landis and Koch, 1977), this suggested that the codes generated were in substantial agreement.

The participants noted the uniqueness of ASSIST-OTCPP, since there are no other tools and frameworks available for the design of OTCP packaging. One of the aims of this study was to validate the framework that is to confirm that the level of accuracy of the knowledge is acceptable. All participants noted that the framework successfully accomplishes its goal of considering aesthetics and sustainability within the design considerations of OTCP packaging. Five out of the eight participants specifically mentioned that all aspects of the OTCP packaging design process are represented. One participant said: *"you have to place it in the full world of packaging, and my impression is that you did it, based on your approach"*. The second aim of this study was to verify the framework that is to ensure that the knowledge base is correctly implementing its rules. The framework should give the designers information on how to design for aesthetics and sustainability in the most efficient way possible. This can be accomplished by optimising user experience. Some of the common words and phrases that were stated by the participants about the usability of the framework and tool include *"easy to learn"*, *"easy to use"*, *"efficient"*, *"exceeds expectations"*, *"value to designers"*, *"good user interface"*, *"organised"*, *"practical"*, *"useful"*.

All the participants agreed that the stakeholders are well represented in the framework, one participant specifically mentioning *"how in the middle especially, the people and stakeholders [are presented]"*.

As the focus of this study is on aesthetics and sustainability in OTCP packaging, the framework achieves this goal, as concluded from the evaluation. Given that, some participants suggested to incorporate more aspects of OTCP packaging design, such as specific manufacturing constraints that are associated with machines. This will meet the needs of other stakeholders throughout the supply chain, such as machine operators. One participant noted that there is *"a huge range [of stakeholders]"*. Therefore, to meet the needs of all stakeholders within the OTCP packaging supply chain is out of scope of this study. One participant noted that *"it is a generic tool, in the sense that it is not customised to a particular product or company. So it has to be open"*. Regulations, such as those on the packaging text, or the type of packaging, depend *"on what the active ingredient is"*, one participant noted. Therefore, a generic framework was generated, given that each company would need to tweak

the framework to meet the necessary functional requirements of the packaging. One participant gave the example of an OTCP product that is required to have blister packaging. Therefore, while options for bottles are given, this framework gives suggestions on how to optimise blisters for sustainability and suggests aesthetic qualities based on target consumer demographics. Given these limitations, all participants agreed that they would consider using such a framework and tool in their design practice.

7. Discussion

Revisiting the research objective *'To develop a framework to design aesthetically pleasing sustainable over-the-counter pharmaceutical packaging and evaluate it'*, this study proposes a framework to guide OTCP packaging designers from an aesthetic and sustainability perspective. The biggest impact of this study is in its contribution to the design research area, in the development of computer-based support tools for design activities. This provides the first step towards a holistic approach to a stakeholder focused design of aesthetically pleasing and sustainable OTCP packaging. Thus, will lead to improvements in the design of OTCP packaging, by ensuring that the needs of the stakeholders are met. Aesthetic attributes facilitate identification, and act as marketing tools to make the packaging stand out against other products. Sustainable packaging aims at minimising the negative impacts on the three pillars of sustainability, which contribute to an overall stronger economy, society, and environment. Section 3 provided a literature review, whereby three design support systems for packaging were reviewed with respect to the framework requirements established in Section 2. None of the design support systems were suitable to design aesthetically pleasing and sustainable OTCP packaging, as they cannot be used in the task clarification stage or address aesthetics and stakeholder requirements.

Studies (Lorenzini *et al.*, 2017; Ward *et al.*, 2010) indicate that stakeholders should be better represented in pharmaceutical packaging design, through market research. The framework incorporates knowledge gained from studies with pharmacists and consumers (Section 4), and information from OTCP packaging on the market as a basis for aesthetic and sustainability evaluation. This was highlighted in the evaluation (Section 6) as being strengths of the framework and of subsequently implemented tool.

The study conducted by (Buchert and Stark, 2018) gives an overview of the main sustainability criteria that should be considered during the design process, which concern the three pillars of sustainability. These include emissions, safety, cost, and resource consumption, which are all considered throughout the sustainability analysis of the framework. Trade-offs need to be made between these criteria, and become more complex when taking a whole life cycle approach, which is necessary to avoid shifting negative impacts down the packaging's life cycle. To cope with the complexity of sustainable design, a support system can be used, to provide the relevant knowledge required for decision making.

The OTCP packaging aesthetics are composed of visual and verbal elements, where the visual elements include graphics, such as colours. While there are other aesthetic considerations that could be taken, this study focuses on colour, as it is the most striking visual element (Kauppinen-Raisanen and Luomala, 2010; More and Srivastava, 2010). In the medical domain, colour is used as an identification aid to reduce medication error (Stuth, 2002), and incorrect medication has been taken due to the similarity in packaging. This framework uses OTCP packaging as a basis for the aesthetic attributes comparison, to display what colours are most common based on the type of OTCP product (such as painkillers or vitamins). The response to colours is dependent on country (Kauppinen-Raisänen *et al.*, 2012), and the framework categorises the colours based on market. The verbal elements of the packaging's aesthetic attributes are considered by the standards related to the printing and labelling life cycle stage of the OTCP packaging, listed in Stage 2c of the framework.

Along with the merits of the study with consumers and pharmacists in Section 4, it has some limitations including the fact that the data is solely collected from Malta. This study was conducted during the Covid-19 pandemic, and therefore travel and participation in this study is limited. Panadol® is a brand of paracetamol which is familiar with the Maltese population. However, this is not the case for other countries. For example, in the United States, paracetamol is more commonly known as acetaminophen for the generic OTCP, and Tylenol® is the most popular branded OTCP product.

The experts selection in Sections 2 and 6 capture a range of expertise in the field of OTCP packaging design, as they come from a variety of backgrounds. A more specific group could have been interviewed, being solely made up of OTCP packaging design engineers. This could potentially deliver a different

outcome. However, a generalist group was chosen to provide a holistic view of the OTCP packaging design process to reduce the bias of one discipline. Another limiting factor is the fact that interviews were held via videoconference. This potentially affects the responses, compared to in-person interviews. Given Covid-19 constraints, getting access to participants resulted to be extremely challenging. Another limitation is the consideration of social sustainability in the framework and proof-of-concept tool. The framework adapts a Design Thinking approach, which involves human centred design. In that respect, stakeholders are acknowledged. The framework considers quantitative design performance indicators for the environmental and economic factors, such as weight and cost. However, the social factors considered are limited to being qualitative, by including safety standards. Nevertheless, social aspects may be broken down into quantitative targets, such as cost. Generic medication is cheaper than branded, and is therefore more affordable to the consumer. A study in (Ward *et al.*, 2010) noted that pharmaceutical packaging should be accessible to all users.

8. Conclusions

The main contribution of this work is the ASSIST-OTCPP framework, which provides guidance to OTCP packaging designers when designing for aesthetics and sustainability, with a user-centred approach. This contributes to a holistic approach in the task clarification design phase that represents the complexity of a sustainable and aesthetic focus in OTCP packaging design. If the limitations of the framework can be overcome, it can be used to formulate a problem statement in terms of sustainable, aesthetic, and consumer requirements and will lead to improvements in the design of OTCP packaging. As reflected in the qualitative data collected throughout this study, the framework architecture makes it possible for companies to tweak it to reflect more their needs.

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