

Engaging Parenting Through The Multifunctional Jacket Bag Baby Carrier

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Abstract — Multifunctional jacket bag baby carrier is designed to fulfil both aesthetic and functionality aspect of carrying babies. In this paper, the focus is the jacket bag baby carrier and the proper way of mass producing this product is also researched. This research is done to contribute the production processes of baby carrier outfit that can be applied by manufacturers, designers, and academia. Qualitative research method such as observation, interview and experimentation are mainly used to obtain data. Quantitative data is obtained via survey to identify the right design. The main advantage of this product is that it can fulfil the functionality and aesthetic category while also engaging parenting via proper baby positioning in the carrier that is conducive for parental bond formation.

Keywords - Multifunctional; jacket bag; baby carrier; aesthetic; functional wear

1. Introduction

The multifunctional and aesthetic aspect of this product is experimented and introduced into the Malaysian market. In this paper, the focus is the jacket bag baby carrier and the proper way of mass producing this product is also researched. Nowadays, parents need to be able to multitask while also carrying the baby. Therefore, a jacket bag maternity attire must be introduced to enable parents to fulfil their duties while also looking fashionable at the same time. According to Schon (2007), "This is vital as women in most non-industrial societies carry their offspring with them for more than 50% of the day". Cross-culturally, the most common form of infant care involves the mother carrying her own offspring throughout the day so that the infant has constant access to her breast for maternity needs. In addition to developing various methods to carry resources, societies around the world have also created different ways to carry their infants. According to Lozoff (1979), "Infants are usually carried in close body contact, using a sling, a flexible pouch, a wrap, or even no carrying device". According to Bernhard (1996), "Modern hunter-gatherers most commonly utilize slings which can be moved to different locations on the torso and inside or out of the clothing". Therefore, a jacket bag baby carrier inspired by the kangaroo pouch is determined as suitable to carry the baby. With correct orientation and positioning, the baby will feel comfortable and can form parental bond with parent carrying it. Other than satisfying functionality needs, this design is also aimed to enable the user to be fashionable. The emphasis on aesthetic enables this jacket bag to be multifunctional. This design concept is the first of its kind to be introduced in the Malaysian market and will be pioneering the production of multifunctional jacket bag baby carriers

2. Baby wearing

Babywearing is a form of baby transport which can be enjoyed for as long as mutually desired, often until toddlerhood and beyond. It has recently gained traction due to advocates of attachment parenting. There are also several benefits of babywearing, especially new-borns. mothers' oxytocin levels are increased through the physical contact with the infant, leading to a more intimate maternal bond, easier breastfeeding, and better care, thus lowering the incidence of postpartum depression and psychosomatic illness. Similarly, the father carrying the baby can develop paternal bond with the baby. Infants who are carried are generally calmer because all their natural survival needs are met. The caregiver can be seen, heard, smelled, touched, tasted, provide feeding and the motion necessary for continuing neural development, gastrointestinal and respiratory health and to establish a balance of inner ear development and muscle tone is constant. Next, parental rhythms like walking and heartbeat can have balancing and soothing effects on infants. Infants are "humanized" earlier by developing socially. Babies are closer to people and can study facial expressions, learn languages faster and be familiar with body language.

Other than that, independence is established earlier. The attachment between child and caregiver is more secure. Decreases risk of positional plagiocephaly ("flat head syndrome") caused by extended time spent in a car seat and by sleeping on the back. Cranial distortion resulting from non-vehicular time in car seats has shown to be more severe than in children who develop plagiocephaly from back-lying on a mattress.

2.1 Practicality babywearing

Babywearing allows the wearer to have two free hands to accomplish tasks such as laundry while caring for the baby's need to be held or be breastfed. Babywearing offers a safer alternative instead of placing the baby on a car seat on top of a shopping cart. It also allows children to be involved in social interactions and to see their surroundings as an adult would. There are many different types of carriers available to purchase namely wraps, slings, mei tais, and soft structured carriers with buckles that make up most carriers. In the western world, carriers can also be a fashion statement and be worn as part of an outfit. They come in many different designs and colours and are available in many different types of fabrics from specialist manufacturers, including bamboo, silk, hemp, cotton, wool, fleece, flax/linen and more recently some synthetic blends such as Repreve and Tencel.

2.2 Infant feeding and babywearing

Breastfeeding and babywearing often go hand in hand. Many baby slings and other carriers offer mothers privacy and for many mothers, the option of nursing hands-free while tending to other activities or household chores. Not all mothers can nurse hands-free in a baby carrier. Large-breasted mothers and mothers of small or hypotonic infants may need to support the breast or help maintain proper positioning of the baby's head or body. Even so, a properly adjusted baby carrier can help reduce arm strain and allow the mother more freedom of movement while nursing, even if it does not allow her to be completely hands-free. Babywearing can help premature babies and babies who are slow weight gainers to gain weight at a faster rate. Since the baby is held up close to the mother, the baby will be able to be nursed more often and often for longer intervals. Kangaroo care is well-studied and has shown clear benefits to premature and ill infants. Not all parents find breastfeeding in a sling or carrier easily. It is important, before attempting to breastfeed in a carrier, to first master the art of breastfeeding without a carrier. Latch and position are vital, and it is important to establish these first before adding a carrier to the mix. Where breastfeeding difficulties exist, babywearing can simplify the other tasks of parenting by allowing parent-free hands to deal with breast pumps, bottles, and other supplementation devices.

2.3 Kangaroo mother care (KMC)

Kangaroo care or Kangaroo Mother Care (KMC), sometimes called skin-to-skin care, is a technique of new-born care where babies are kept skin-to-skin with a parent, typically their mother. It is most commonly used for low birth-weight preterm babies, who are more likely to suffer from hypothermia, while admitted to a neonatal unit to keep the baby warm and support early breastfeeding. Kangaroo care, named for the similarity to how certain marsupials carry their young, was initially developed in the 1970s to care for preterm infants in areas where incubators are either unavailable or unreliable. There is evidence that is effective in reducing both death and the risk of hospital-acquired infection and increasing rates of breastfeeding and weight gain. According to Bernhard (1996), "It has proven successful in improving survival rates of premature and low birth weight new-born's and in lowering the risks of nosocomial infection, severe illness, and lower respiratory tract disease".

2.4 Modes of infant carrying

Four main methods for carrying babies have been developed which is a front wrap, back wrap, side sling, and no tools. According to Bernhard (1996), "Front wraps are found in Mayan society and among Westerners today in the form of front slings or pouch baby carriers". Front carriage is not very prevalent cross-culturally because if the mother is working or cooking while she is carrying the baby, the baby may get in the way or even get hurt. According to Schon (2007), The front position, while being less popular in combination with a carrier, is obviously a common choice when carrying a child in one's arms or as a temporary position during breastfeeding". The front wrap position can be accomplished by using a single piece of cloth that wraps around the torso of the carrier and/or over his/her shoulders. Cited from SoBeBabies, some contemporary Western carriers are also made of cloth while others look like a backpack worn in the front". Like the front wrap, the back wrap also requires the use of a single piece of cloth that is wrapped around the torso of the carrier. According to Ayres (1973), "Other back wraps are supported by a belt around the mother's waist". According to Reynolds (1996), "The Inuit also carry their infants on the back, but in the hood of their parka". ERGObaby stated that, "Carrying babies on the back is also common in industrial cultures using a carrier similar to a backpack". However back carrying is not heavily studied. One of

the most common areas of research in back carrying involves school children. In many countries, children are carrying increasingly heavy loads in their backpacks. According to Wong et al. (2006), “Researchers and parents are concerned with health issues that arise from young children and adolescents continually carrying heavy loads”. Side sling in which the child is carried on the mother’s hip and is supported by a sling or shawl. According to Lancaster (1978), “The side sling is found in the Balinese, Yanomano of the Amazon, the Lese in northeast Zaire”. As with the other carrying positions, they are not found solely in non-industrial societies. Westerners are also beginning to use the sling when carrying their infants. While the first three modes of carrying can free the mother’s hands for work, the last carrying position is slightly more difficult. The fourth way to carry an infant is without the aid of a device or tool. According to Ayres (1973), “The child is carried on the mother’s hip, back, or even shoulders”. This type of carrying usually requires the use of the carrier’s arms to help support and stabilize the baby, so it is harder for the carrier to do other work.

2.5 Benefits of infant carrying

The first advantage of infant carrying is that it allows the infant to breastfeed whenever it needs to. All the nutrition an infant need can be found in his or her mother’s breast milk, which happens to be cost-free and instantly available. According to Lozoff (1979), “Human milk is low in fat and extremely low in protein, suggesting that the human infant is adapted to frequent feeding and extensive maternal contact”. Holding a baby close to the body allow him or her to be soothed by the carrier’s heartbeat, a sound they heard while in the womb. According to Schon (2007), “Research data supports the notion that young infants feel most comfortable in an environment approximating that before birth”. Other than that, babies who were exposed to a recording of a human heartbeat were shown to cry less, to pacify easily, and to be generally healthier than babies who were not exposed to a regular heartbeat after birth. As well as having that comforting sound of the heartbeat, walking and working while carrying also provides a soothing rocking motion. According to Ayres (1973), “Infant sleep peacefully while the mother works, abandoning themselves completely to the movements of the carrier”.

2.6 Fashion

Dating back to 20 000 B.C., fashion is already being considered as an important element in daily life. During those days, clothing was mostly developed for protection from the environment and harsh weather. These pieces of fashion are made from natural sources such as animal fur, animal skin, and tree barks. According to the Oxford English Dictionary, fashion is defined as “a popular or latest style of clothing, hair, decoration, and behaviour”. Simply put, fashion is a style that is up-to-date and how this is agreed upon is subjective and relies on several factors. For example, in the late 1970s movements called punk exist as a reflection of how young people feel at that time. According to Sorger (2012), “The movement called punk is disenchanted with politics and culture at the time”. There is also another opinion regarding the term of fashion. According to Gini Stephens Frings (2005), “fashion as a reflection of the social, political, economic and artistic forces of any given time. The historical events will usually come with the information about the style changes according to the era. Fashion also can be considered as the way of how people think, live and love or can be clarified as lifestyle and culture”. Fashion can be described in four keywords which are Line, Shape, Texture, and Function. The word line in the fashion can be referred as an element of design that directs the path of eye movement. When a designer had the inspiration to design a collection, first he or she should consider the shape or silhouette of the collection. Usually, there will be more than one silhouette in a range. The third keyword is texture, the word texture refers to the surface of the material and what the type of material in the range. Lastly is the designer consideration about the function of the designs is important. A designer should be able to identify the functions of a garment in the first stage of the designing purpose.

3. Methodology

There is a mixture of methods used to collect primary and secondary data in this research. Qualitative and quantitative analysis are utilized to analyse data to help achieve the objectives of this research. To get the information or demand of the consumer, the quantitative method a pilot test by using questionnaire has been used to collect the data. As for the qualitative data, the researcher used several resources, including observation, interview and experimenting material and pattern. Figure 1 shows the flow chart of the research and figure 2 shows the flow chart of the data collection.

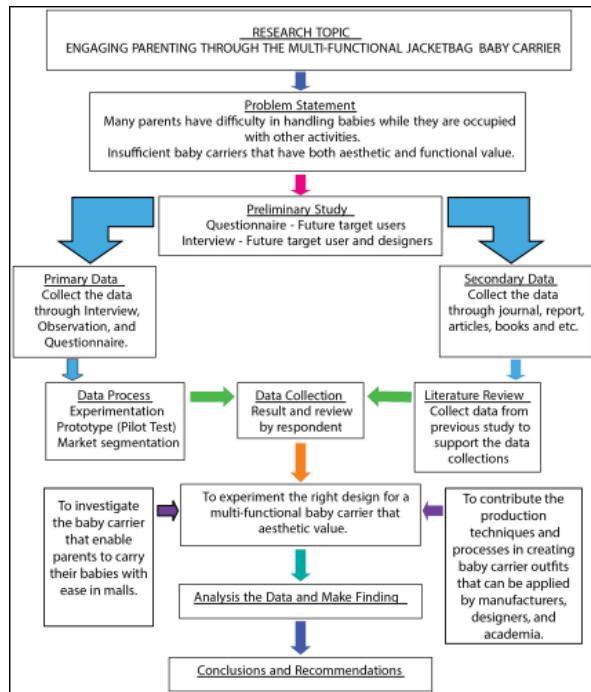


Figure 1: Flow chart of research

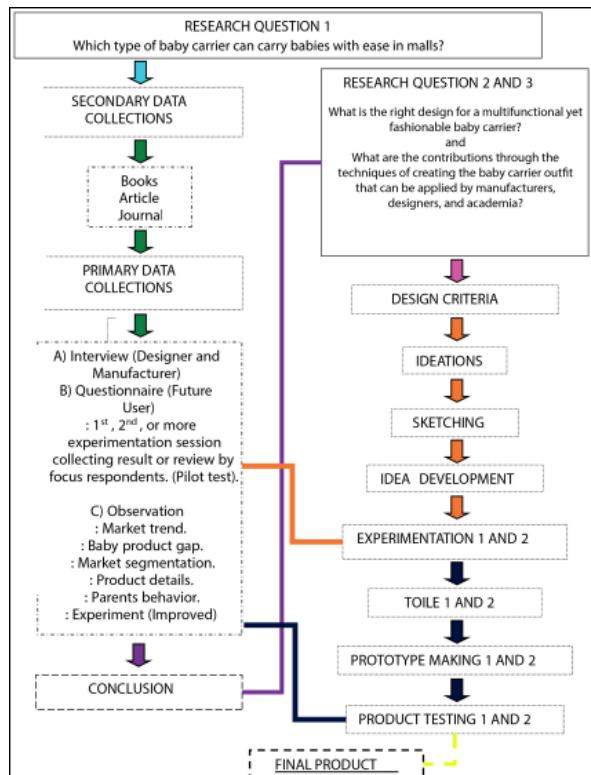


Figure 2: Flow chart of data collection

3.1 Observation

This method is used to study the design references and problems faced by targeted client group. The researcher studied the practicality and design used by the existing label to produce a range of baby carrier jacket. Observation is conducted by the researcher around Klang Valley, Kuala Lumpur, and Putrajaya area shopping malls such as Pavilion, IOI City Mall and Setia City Mall. Malls are selected as site of observation because malls are one-stop centres for consumers to purchase products needed. There are various brands of baby carriers that can be selected in these malls. After observing design by various brands, data is analysed by using important keywords that are used as design criteria to produce a range of Malaysian designer label for baby carrier jacket-bag attire.

3.2 Interview

The interview method will be focused on the opinion of other designers about producing baby carrier jacket-bag attire. The researcher had interviewed one baby carrier manufacturer, one fashion designer and an expert in development of infant. A doctor is also interviewed to gain scientific information about foetal development and its relation to the mother. This interview is also important to know how baby react to the material of the garment, changes in body size of the baby and the optimum orientation for carrying the baby. The interview session is divided into two categories according to the expertise of the respondent. Each respondent was interviewed using different set of interview questions. The first respondent is Mr. Hairi Mohamad, the production manager of the Tiny Tapir Sdn. Bhd. The researcher chooses Tiny Tapir Company because it is an experienced company in manufacturing babywear since 1990 and it is involved in importing and exporting babywearing from and to other countries. The interview was done using one to one method in the respondent's company at Taman Cheras Awana, Cheras. The second respondent is Jovian Mandagie, the owner of JMTower. This designer is selected to be interviewed because of his achievements in the fashion industry and in fashion reality show. The interview is a one to one session at the designer's boutique in Section 7, Shah Alam. Next, the designer chose Prof. Dr. Muhyaya Binti Muhamad to provide supportive scientific data. This is because she is an expert in the development of infant and she also can provide scientific verification on the concept of the designer's product.

3.3 Questionnaire

The designer carried out the preliminary study about the selection of the most suitable baby carrier for the baby and to identify the problems faced by parents when they hold their babies. The preliminary study was held in Kuala Lumpur, Putrajaya, and Shah Alam areas. This research has been carried out using survey through questionnaires that are distributed to 80 respondents in the Kuala Lumpur, Putrajaya, and Klang Valley areas. The respondent chosen are expectant parents, aged between 19 to 40 years old. This age group of respondents had been chosen because most of the parents are from this group of age. The questionnaire given to the respondent is a closed question where the questions are multiple answers to select. The survey was conducted at several places on different dates to obtain more accurate data.

4. Result and discussions

4.1 Observation analysis

Based on the observation analysis, pre-existing baby carrier products elements are being integrated into producing a new jacket bag baby carrier. The researcher had found that there is no design for a garment embedded with the baby carrier in selected Malaysia baby store. The designer's idea is to combine the garment with the baby carrier to form a new 2-in-1 jacket bag. Then, the designer observed and took note of the design criteria to be analysed especially on the pattern construction of the baby carrier and the placement of the trimming of the garments. The materials play a big role in the durability of the products. The existing baby carrier designs were almost all the same. Therefore, the solution is to create a versatile design where the garments are suitable for different occasions. The design is designed to be able to exude a professional, casual, or adorable look. This design should appeal to various parents from the different background due to its versatility. The criteria observed are design, trend, design variety, material, quality and price. Products from each label is then analysed if it fulfils the criteria. Brands observed are popular moderate market brands such as Mothercare, Spring, Aeon in Shah Alam and Animation World. Results of observation is summarized in table 1.

Table 1: Observation analysis

CRITERIA:	MOTHERCARE:	SPRING:	AEON, SHAH ALAM:	ANIMATION WORLD:
Design	O	X	O	O
Trend	O	X	O	X
Design Variety	X	X	O	O
Material	O	O	X	O
Quality	O	X	X	O
Price	O	O	O	X

(O = criteria fulfilled, X = criteria not fulfilled)

4.2 Interview findings

The interview sessions are done by the researcher are important to gain opinions from the expert regarding the maternity wear. There are three interviewees with different fashion background in industrial fashion production. First, Mr. Hairi Mohamad who is the production manager for Tiny Tapir Sdn. Bhd., he is experienced in the production of the baby product like baby transportation and baby clothes. This company also doing export and import the baby clothes to the Asian country like Indonesia, Singapore, and Taiwan. When asked about the viability of commercializing the baby carrier jacket bag, Mr. Hairi responded that it is viable to do so but as of now Malaysian market does not have a benchmark to mass produce this product. Mr. Hairi is also asked about the important elements in the production of a baby carrier. He responded that quality of materials, durability, and safety of the baby carrier jacket bag design is important. The baby carrier is ensured to be able to provide the baby with comfort and is safe for the baby. He also added that aesthetics of the design is important as millennial parents prefer to wear fashionable articles and are willing to splurge on the luxury of fashionable clothing. Jovian Mandagie (JM) was also asked about the idea of commercializing baby carrier jacket bag in Malaysia. He is highly supportive of the idea as it is able to challenge designers and enable them to come up with new and better designs. The second question is if the ready-to-wear concept a suitable method to integrate baby carrier into garments. He responded that it is a good idea for the Malaysian fashion market. It is something new where designers have to think out of the box and contribute towards practical ideas that are acceptable for parents nowadays. Moreover, he added that trend is another important element that has to be prioritized so that our designs are fresh and can be a benchmark for future designs. The third respondent is Prof. Dr. Muhyaya Binti Muhamad. When asked about the viability of the idea of a baby carrier jacket bag, she responded that it is a very good idea to further increase the parental bond between parents and their child. When asked about the advantage of this design towards research about maternity, she commented that the placement of the baby carrier at the front part facing the chest is a good idea. From the viewpoint of the human anatomy, carrying a baby at that position can help to relieve pressure applied to the carrier and also reduce the stress inflicted upon the baby. Other than that, that position enables the baby to feel the heartbeat of the parents. This can help soothe the baby and make the baby feel safe.

4.3 Survey findings

Through the survey conducted, the researcher had been distributing questionnaire to a total of 103 respondents in Shah Alam, Kuala Lumpur and Putrajaya area. The researcher is focusing on the design criteria of consumer needs towards the ideas of jacket bag product and also focused on parents aged between 19 to 40 years old. Data obtained from questionnaire are collected and simplified in Figure 3, 4, 5 and 6 to highlight the importance of each criteria.

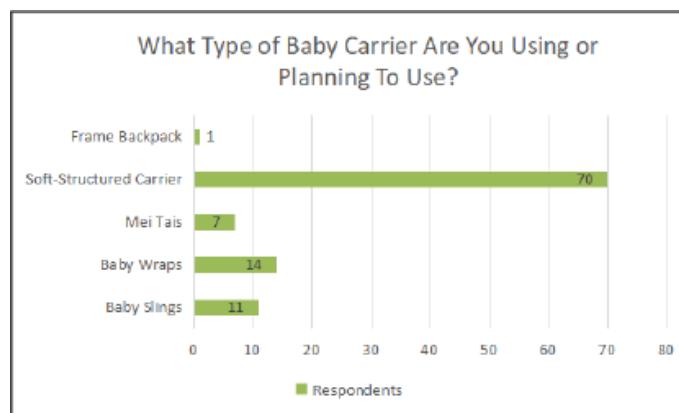


Figure 3: Percentage of baby carrier preferred by respondents

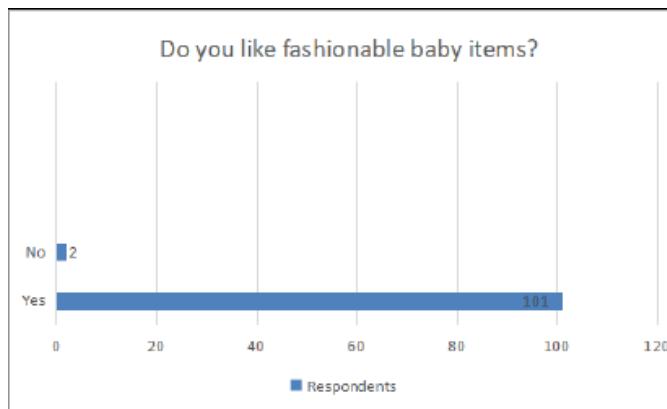


Figure 4: Percentage of respondent's opinions on fashionable baby items

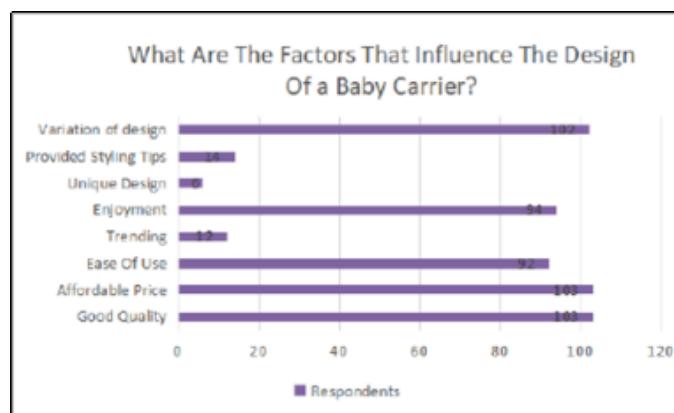


Figure 5: Percentage of factors influencing design of baby carrier

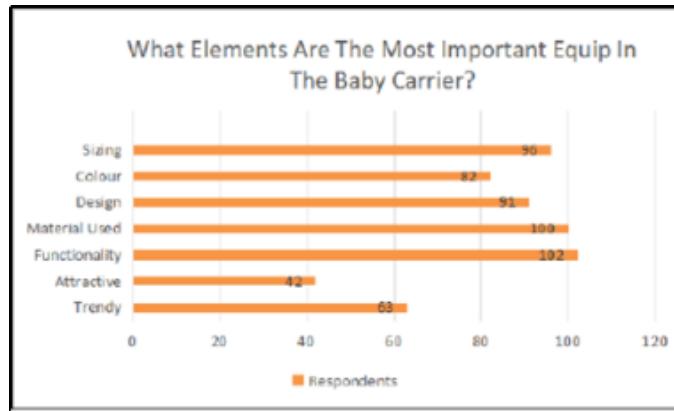


Figure 6: Percentage of elements to be equipped in baby carrier

Based on the survey conducted, around 70% of the respondents prefer soft structured carrier. When asked about preference of fashionable baby items, 99% of the respondents like fashionable items. Other than that, factors influencing design of an optimum baby carrier preferred by parents are also questioned among the respondents. Significant factors include variation of design, enjoyment, ease of use, affordable price and good quality. The researcher also inquired about elements that are vital in baby carrier. Among factors that is needed for a baby carrier are sizing, colour, design, material, functionality while attractiveness and trendy elements are not that important. Data obtained from respondents show that design elements of the baby carrier are important as well other than functionality. The obtained data based on respondent's opinion is used to help come up with an optimum design for the baby carrier.

4.4 Discussion

Based on the results obtained, a few factors are identified to be of importance for the design of a baby carrier. First, positioning of various body parts of the baby is extremely important in order to provide a suitable carrier is comfortable for both the baby and the parents. It comes with various benefits.

4.5 Design considerations

Figure 7 shows the criteria of the design consideration in multifunctional jacket bag attire in a flow chart form. The flow chart was made as a guideline to help the researcher during the future design process. It is also to ensure the researcher follow the design criteria based on the previous data collected on the survey.

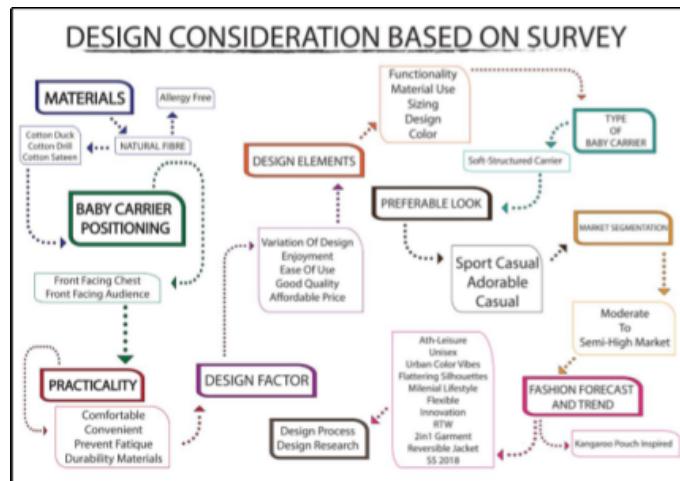


Figure 7: Design consideration flow chart

4.6 Material

Material plays a great role in the making of a baby carrier. The right material will ensure the practicality and comfort of the clothes and at once solve the needs of customers. Medium weight natural fibre are used because of the durability and suitability for outerwear garment. Cotton duck, cotton drill, cotton sateen and cotton is the best fabric to choose because of the allergy tested free and heat insulator properties. These fabrics were combined to create an interesting look for the reversible and textured outerwear jacket bag.

4.7 Inspiration

Research in design also can be defined as an investigation into something new or from the past. In the creative process, it is essential to feeding the imagination by gathering the material or information regarding the inspiration. The processes include reading, visiting or perhaps viewing and again, it is about recording information. The researcher founded that there are four different elements resembling this maternity jacket, which are the carrier, baby, background of breastfeeding and nature inspired. All the important keywords had been placed in a figure 8. The figure is important because of it help the researcher to be acquainted with jacket bag baby carrier general information.

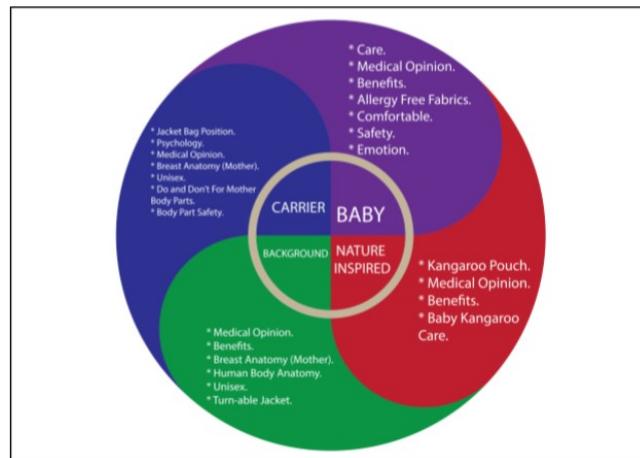


Figure 8: Information and keywords for baby carrier

4.8 Practicality and experimentation

Functional wear can be categories as practical wear. The word functional wear can be described as user-requirement specific and design or engineered to meet the performance requirements of the user. As mentioned before, practicality is one of the design criteria of the research. This jacket bag baby carrier should be practical and has aesthetic value to ensure the objective is done smoothly. This is because there are lots of locomotion involved while using this jacket bag baby carrier. Carrying the babies with security and comfort while carrying is very important to this kind of design. Therefore, it is the designer's responsibility to produce and at the same time, to offer these aspects to the parents. As aforementioned before, there are five types of baby carrier namely wrap, slings, Mei Tai's, soft-structured carrier, and baby backpack. All the carriers above have the same main function which is to carry babies. The question lies in the choice of baby carrier which most suited for carrying babies. According to the Prof. Dr. Muhaya Mohamad, "the front carry where the baby facing to his or her mother is the best way to carry baby rather than back carry and side carry". Other than that, according to the results by the respondents, the majority chose soft-structured carrier because of the safety and practicality. After the process of justifying the right position and carrier type, the researcher had analysed woman's bodice and measurements in order to design a range of maternity wear. Woman's body parts can be divided into five which are the neck, bust, down bust, waist, and hips. Based on the analysis done, there are four main parts that had been considered by the researcher while designing. The four main parts are the bust line, down the bust line (under bust line), waistline and the measurement of nip to nip.

This research is to produce a range of maternity wear which is jacket bag baby carrier using standard measurements which are S, M, L, and XL. Even though the standard measurement chart contains all woman bodice measurements, there are some of the measurements that had been adjusted by the researcher in order to suit the breastfeeding mother's body measurements. The measurements include measurements from the neck to bust, neck to down the bust and neck to waist. As mentioned before, the bust will start producing milk and automatically it will affect the measurements of neck to bust, neck to down the bust and neck to waist. Other than that, the measurement of nip to nip (nipple to nipple) is also important while designing the collection. This is because the purpose of this collection is to allow mothers who are breastfeeding feels comfortable while wearing this jacket as well as while carrying their baby and at the same time being fashionable. All of the measurements act as a guideline while designing the range. In this research, the researcher used the element of simplicity in the design. Researcher used simple tools such as reversible slider zipper at the opening of the clothes as the fastening. The use of reversible slider zipper at the opening section of the garment will allow the parents to easily and conveniently change while wearing the jacket. It will help the parents to easily change the look or wanted to wear off the jacket at the unexpected place, especially in the public areas. The type of zippers used was reversible slider zipper, this is because these types of zipper allow the wearer to change the inner to the outer side of the jacket while not disturb the design line, plus the zippers are suitable for medium weight fabric. Other than that, the zip puller moves along a rotating rail. The zipper opens and closes from either the front or back. Besides the measurement and opening consideration, the researcher also considered another function of the attire which the baby carrier is to carry the baby. As we can see, nowadays, a lot of baby carrier are not aesthetically pleasing to our eyes especially the medium price to the low-price range of baby carrier product. Using the same colour for overall baby carrier and very uncomfortable soft padding for baby and carrier and placement of the baby leg is the very crucial problem needs to solve. According to International Hip Dysplasia Institute, (2017) "After birth, it takes several months for the joints to stretch out naturally. Babies that have been in the breech (bottom first) position may need even more time to stretch out naturally. The hip joint is a ball and socket joint. During the first few months of life, the ball is more likely to be loose within the socket because babies are naturally flexible and because the edges of the socket are made of soft cartilage like the cartilage in the ear. If the hips are forced into a stretched-out position too early, the ball is at risk of permanently deforming the edges of the cup-shaped socket (Hip Dysplasia) or gradually slipping out of the socket altogether (hip dislocation). Hip Dysplasia or dislocation in babies is not painful so this may go undetected until walking age and may also result in painful arthritis during adulthood. The risk of Hip Dysplasia or dislocation is greatest in the first few months of life. By six months of age, most babies have nearly doubled in size, the hips are more developed, and the ligaments are stronger, so are less susceptible to developing Hip Dysplasia." Again, through the study, the researcher came up with ideas which helped the baby to decrease chances of injury. It also is aimed to make parents more relieved and happier while using this jacket bag baby carrier as well as feeling comfortable aesthetically equipped in this product.

4.9 Toile experimentation

The designer has performed four experiments to find out how the jacket bag baby carrier work. The designer came up with four ideas of jacket bag for comparison as well as to obtain respondents' feedback. The jacket bag baby carrier has four type of designs which is front outer jacket bag carrier, front inner jacket bag carrier, side jacket bag carrier and lastly 2-in-1 outer jacket bag carrier.



Figure 9: Experimentation process

The first design which used unsuitable fabric caused trouble due to too much fabric stretch that cannot hold babies' weight and this made the jacket bag baby carrier to expand to a much bigger size than it originally is. The lining and the sizing for the carrier are good enough for the wearer but because of the fabric itself, it made the wearer feel too warm while wearing this jacket. Other than that, lack of leg holes for the babies is one of the major problems with this design. Next, the second design is the front inner jacket bag carrier type. This design cannot hold the baby unless the carrier uses one hand to support the baby's lower part. The zipper cannot be used and other mechanical means like buckle is needed to hold the baby more steadily. The fabric used is not suitable as well because fabric has too much stretch. Even this design has the internal leg support (leg hole) placed at inside the jacket, it is also cannot hold the baby and make the baby feel uncomfortable while sitting inside that carrier.

The third jacket bag baby carrier design is the side jacket bag carrier. This design placed the jacket bag at the side of the jacket either on the right side or left side. This positioning is good, but it makes the jacket itself imbalanced. This is because the fabric and the material used for this jacket and this position are not suitable enough to hold the baby as well as to hold the jacket. The lack of internal leg support is another problem that has to be resolved. Regarding the unique position of the jacket bag baby carrier, it is implausible to put baby carriers at both sides of the jacket even though most of the respondents wanted it to be that way. This is due to the weight of the material which makes it impossible to support the baby and the carrier itself.

Lastly, the fourth idea is a 2-in-1 outer jacket bag carrier which is much easier to be worn and comfortable to be used. This design consists of two pieces of garment which is the jacket bag carrier and the reversible jacket for two different looks for one piece of a jacket. The designer used a much stronger fabric that is less stretchable to give more support to the babies. This design also improved the internal support for the baby's upper body and the legs. The designer used the concept of the first design which is the front outer jacket bag carrier but with improvised design elements after considering feedback from respondents. The respondents commented that this design is wearable and also resolved the safety issue for the babies as well as the carrier too. At the jacket bag baby carrier, the designer used the soft padding for the seat, chest and the back of the carrier to make the baby feel comfortable and safe while the carrier carries their baby.

4.10 Design process

The design process is a method that require critical thinking to solve design problems that might arise throughout certain stages. In designing and producing the product, the process also can be replicated and used for a variety of different problems. Regularly, each of the stages or step can be methodical and be done regularly. The design process itself is a combination of analytical accuracy, synthesis methods, and tools based on the “building up” of ideas. It also could potentially lead to the discovery of hidden desires, and also potentially vital design insights. Figure 10 is a flow chart entailing the design process.

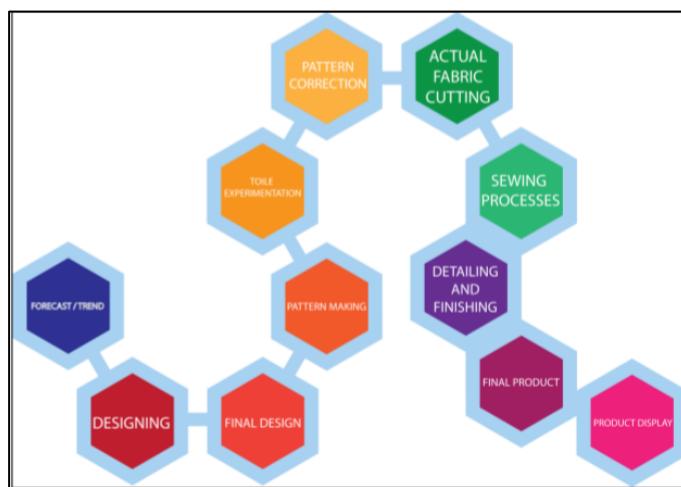


Figure 10: Design process flow chart

4.11 Colour selection

Other than fabric selection, the researcher believes that colour schemes and elements will affect the total look of the collection. As mentioned before, the colour used in producing the collection is based on the colour forecast for spring/summer 2018 collection. There are a few trials regarding the arrangement and colour combination until it suits the design the best. The colours were also based on the inspiration which is urban-ism Ath-Leisure. Researchers have selected a combination of deep blue, ice grey, burgundy, and light grey as the colour used in the collection. The designer also used printed on cotton duck fabric as main patterned fabric.

4.12 Pattern construction

A pattern is an engineered site of making garments. This is because the way of constructing the pattern according to certain measurements will affect the look of the product. The measurement of the body should be calculated wisely to avoid error measurements while making the pattern. There are three stages or type of pattern which is the master pattern, working pattern, and final pattern block. The patterns are constructed according to the desired design. There are two methods of doing the pattern in fashion which is flat pattern and draping. In conducting this research, the researcher used flat pattern method. Firstly, the researcher traced out the line from the women's bodice block and men's bodice block. Then the researcher drew the design line, according to human body proportion on the basic bodice block. This process must be done wisely to ensure that the design suit the body perfectly. The designer compared both blocks to get the unisex block for unisex garment. All the alterations between blocks are done to form a new unisex block according to the desired design. The next process is working pattern. In this process, the design line was divided and isolated to several parts according to the design line drawn on the master pattern. After tracing the pattern, the working pattern is being reshaped to adjust the selvage of the pattern. All the reshaping and pattern adjustment process is done in this process. Normally, the pattern parts that need pattern adjustment are at the waist, armhole, sleeve crown and the hemming part of the pattern. Finally, the last stage of the pattern making process is to form the final pattern that will be used in the fabric cutting process. Seam allowance will be added to each side of each pattern. The measurements of the seam allowance depending on the parts of the pattern. This seam allowance measurement line act as a guideline to the researcher while cutting the fabric.

4.13 Fashion forecast

A fashion trend forecast is important for a fashion designer. The researcher used fashion forecast to predict future colour, trend, detailing and theme in creating fresh designs for consumers. It also will distinguish the researcher's products from other designers' products. As for the jacket bag baby carrier product, through some research regarding the trend forecast spring/summer 2018, the researcher had picked "Ath-Leisure" theme as the main inspiration for the collection. Ath-Leisure in the 2018 forecast is the main theme.

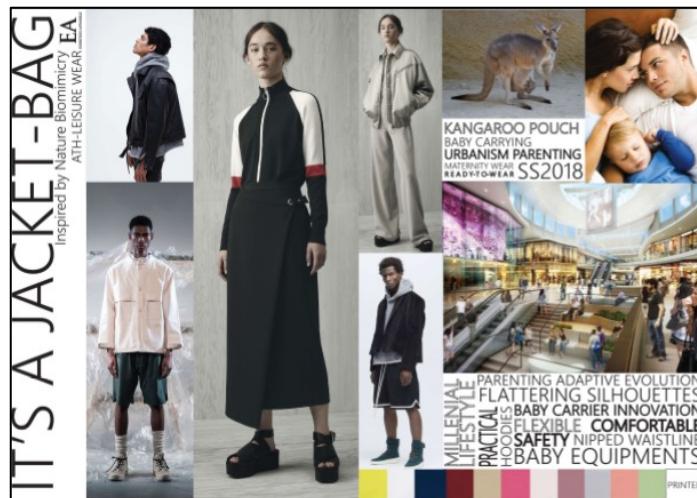


Figure 11: Fashion forecast spring/summer 2018

Figure 11 displays the fashion forecast involved in the design of this jacket bag baby carrier. Other than providing an inspiration for the theme, fashion forecast also includes colour forecast. The colour forecast that was chosen by the researcher for the collection also came from the 2018 spring/summer urban-ism fashion forecast. In addition, the colour in the collection is according to the inspiration theme "Ath-Leisure" so that it could deliver or project the emotion or philosophy behind the collection itself.

5. Final product

Figure 12, 13 and 14 shows the final product design one and figure 15, 16, 17 and 18 shows the final product design two of the multifunctional jacket bag baby carrier. There are four looks which is of the baby carrier with two sides of the jacket that are interchangeable.



Figure 12: First look for final design one (2 in 1 jacket bag baby carrier)



Figure 13: Second look for final design one (full jacket) (reversed)

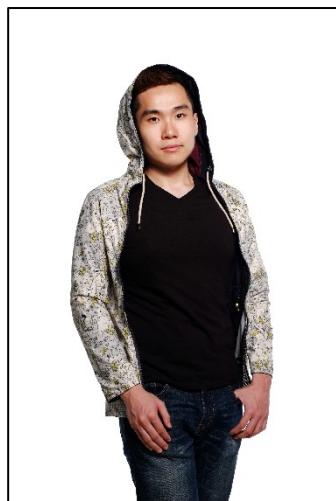


Figure 14: Third look for final design one (cardigan) (reversed)



Figure 15: First look for final design two (2 in 1 jacket bag baby carrier)



Figure 16: Second look for final design two (maternity jacket)



Figure 17: Third look for final design two (cardigan)



Figure 18: Fourth look for final design two (2 in 1 jacket bag baby carrier) (reversed)

6. Conclusion

The research was conducted towards designing and producing a baby jacket bag baby carrier, focusing on the maternity wear. Through this research, the researcher had clarified the process of production of maternity wear which is the jacket bag baby carrier to the aim to good parenting. The jacket bag baby carrier is designed properly according to the client's needs and in other words, to ensure this product can help parents to carry their babies

more easily. During the research, the researcher had identified the design criteria in designing jacket bag baby carrier that is very important to be counted as main elements. There are several types of design criteria used in designing jacket bag baby carrier which is the user, usability, aesthetic, and technical aspect. The design criteria are important to be fulfilled which is the needs of both parties (parents) while holding their babies. From the design criteria itself, the researcher had produced the design of jacket bag baby carrier that suits the process of baby carrying while addressing concerns on comfort, safety, and aesthetically fashionable outerwear.

All three objectives had been met. Through the survey conducted, the first objective which is to investigate the baby carrier that can carry babies without impeding daily activities is answered properly via primary data and secondary data. From the previous survey, most of the respondents believe that soft-structured baby carrier is the most practically usable baby carrier as baby transportation for new-born up until two years old babies. Other than that, according to the Bernhard (2007), “soft-structured baby carrier is the most practical devices to be used by parents nowadays”, which can clearly be supported that this baby carrier can help parents to carry their babies during locomotion. Next, the second objective which is to experiment the right design for a multifunctional baby carrier with aesthetic values. The researcher conducted multiple experiments to discover the right design for the jacket bag baby carrier as well as to inject aesthetic values into the designed product. Then, the designer found that the right position of the jacket bag baby carrier, which is at the front body.

The designer also equipped the pockets and other accessories to fulfil the clients’ needs. Focusing on the aesthetic aspect, the designer had chosen the ath-leisure spring/summer 2018 for the trend as a guideline to be followed. The designer wanted to make a garment with urban-ism vibes. Thirdly, contribution in the production processes of baby carrier outfit that can be applied by manufacturers, designers, and academia is the last objective for the designer to be fulfilled. This research can be applied to them as references to mass produce or the jacket bag baby carrier in future. Based on the research and findings, the researcher produced a variety of design for the jacket bag baby carrier for the moderate to better market in the fashion industry while engaging parenting among parents. This is because the jacket bag baby carrier is one of the products that encourage the formation of bonds among a loving and harmonious family in the future.

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