



Suggested design visions for people with motor impairment in the lower half resulting from knee fractures

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Introduction

A normal life is a right for every individual of the society individuals, including females with movement disabled in the lower half resulting from knee fractures who with special needs, and they have the right to live a decent life and enjoy their humanity because they are an integral part of society and they influence and are affected by it.

They have rights and duties, just like any healthy human living in a civilized society that guarantees his social freedom, and provides equal opportunities for all, and respects the human and social values for its individuals.

Caring for people with special needs is one of the indicators that indicate the development of society and is in line with the Kingdom's Vision 2030, which paid attention to the rights of those who have movement disabled with special needs, and focused on developing the individual to ensure the development of the Kingdom's infrastructure. The field of the social, psychological and educational care has given great attention with the aim of developing and encouraging them to integrate into society and normal life by providing prevention, care and rehabilitation services for females with movement disabled, and support the programs that are directed to people with movement disabled, and encourage institutions and individuals to contribute in the charitable works in the field of disability (vision2030.gov.sa).

The percentage of the number of persons with disabilities in the Kingdom is estimated at 7-10% of the population, according to the latest statistics issued by the General Statistics Authority in the Kingdom in 1437 (27,136,977) twenty-seven million, one hundred and thirty-six thousand, nine hundred and seventy-seven people, and reached the number of females disabled in the Kingdom of Saudi Arabia reached (201,462) (www.stats.gov.sa).

And (Sohair Alsabah and Ayed Alhamouz, 2013 AD) confirmed that people with movement disabled are an integral part of society because they are a segment of society's segments , and they have a role and status that every fair and sane person values. (www.stats.gov.sa).

The problem of disability at the global level is one of the main sources of danger facing societies because of the destruction it carries to the psychological and social entity of human. Despite of all procedures of protection, prevention, and scientific development in various scientific fields, movement

disability is constantly on the rise in all developed and developing countries (Jocelyn R. Grafelli and Daniel J. Van Dorm, 2007).

Movement disabilities in the lower part make the individual feel helpless from a physical aspect, which affects the mental health of the individual because there is a close connection between the body and the soul (Samar Muqlan, 2012).

Recent years have witnessed a remarkable increase in movement disabilities in the lower part, as this disability affects the psychological state of woman and prevents her from conforming and adapting with the society due to the changes that occurred in her body and transformed her from a normal person into a person who has movement disability (Badrah Bahiyah, Obaid Latifah, 2011 AD).

And the acquired disability is the minority that anyone can join at any time, where any person can become disabled as a result of a sudden car accident, assault, addiction, or a disease such as diabetes, cancer, or high blood pressure, and there are 15% of the disabled due to the acquired disability. (<http://www.lifecil.org>).

Scientists have set many classifications for movement disability, including the classification of disability into a congenital disability with which an individual is born, and another acquired.

Acquired disability is when a person was born normal and healthy, but at a certain period of his life he was exposed to an accident, injury, or disease that caused him a disability, and because of that he became known as a person with movement disability, and he became suffering from a disability in his movement and his vital activities as a result of disability, defect, or injury, which affects him naturally, psychologically and socially (Badrah Bahiah, Obaid Latifah, 2011 AD).

The studies that dealt with movement disability varied, such as a study of "Ahmed Alrantisy, 2008 AD", the study of "Jessica Dimka and let, 2017", and a study of "Ra'ed Abd Elamir and others, 2015 AD", as they aimed to meet the needs of people who suffering from disabilities, as well as a study of "Yunyi Wang and let, 2014", and a study of "Sohair Alsabah, Ayed Alhamouz, 2013 AD", and a study of "Ali Alsamady, 2009 AD", where they aimed to identify the problems of people with movement disability and designing and implementing the functional clothes for wheelchair users. In addition to a study of "Yahya Alnajjar, 2012 AD", and a study of "Samar Muqlan, 2012 AD", and the study of "Zuhda Husaina et al, 2010", where they aimed to identify the most important problems and difficulties that facing people with special needs, and designing and implementing the ready-made clothes that are functionally and aesthetically appropriate for people with special needs.

The studies that dealt with the acquired movement disability were also varied, such as a study of "Boujemaa Shweyah, Deif Allah Habibah, 2015 AD", which aimed to identify differences in body image for people with movement disability, as well as a study of "Badrah Bahiyah, Obaid Latifah, 2011 AD", which aimed to identify the differences in psychological adjustment in terms of the duration of integration into the movement rehabilitation process for the study sample, as well as a study of "Kristine Wellerhahn, 2002", which aimed to study the body shape of individuals who suffer from amputation in the lower extremities, in addition to a study of "Odding, Else and others, 200", which aimed to identify the difficulties that facing people with movement disability that represented in practicing the daily life activities.

Research problem:

The research problem can be identified in the following questions:

- 1- What are the psychological, educational and social characteristics of the movement disabled in the lower half resulting from knee fractures?
- 2- What are the clothing problems that the movement disabled suffer from due to knee fractures?
- 3- What are the foundations and standards that must be available in the clothing of the movement disabled in the lower half resulting from knee fractures in order to provide comfort and safety for them?
- 4- What is the possibility of preparing designs for clothing for the movement disabled in the lower half due to knee fractures?
- 5- What are the opinions of clothing and textile specialists on the suggested design visions for people with movement disability in the lower half resulting from knee fractures?

Research objectives:

- 1- Determining the psychological, educational and social characteristics of the movement disabled in the lower half resulting from knee fractures.
- 2- Determining the foundations and standards that must be available in the clothing of the movement disabled in the lower half due to knee fractures, in order to provide comfort and safety for them.
- 3- Designing a proposed clothing group for women with special needs of the females who have acquired movement disability , for the age stage (30-40).
- 4- Identifying the opinions of specialists in the suggested designs for people with movement disability in the lower half resulting from knee fractures.

Research importance:

- 1- Determining the causes of the temporary movement disability in the lower part due to knee fractures.
- 2- Limiting the clothing problems experienced by the movement disabled in the lower half due to knee fractures.
- 3- The study is concerned with supporting the innovative thinking through proposed design visions for clothes for women with temporary movement disabilities in the lower part due to knee fractures for the age stage (30-40).

Research terms:

- People with Special needs:

- People with special needs refers to a category or group of people whose personalities are characterized by abnormal characteristics that may impede their growth, interaction, and psychological and social compatibility, which prevents them from making a positive contribution in life (Najat Hadeef, 2014 AD).

-They are people who suffer from a permanent state of physical or mental sickness that prevents them from participating fully and effectively in society in a manner that would place them on an equal footing with others (www.ohchr.org).

- The Disability:

- A term that refers to the impact that results from the state of disability in the light of different personal, social and cultural variables, (Gamal Alkhatib, Mona Alhadidy, 2009 AD).

- The inability of the individual to meet his requirements or practice his life activities, and his inability to perform his normal role in life as a result of disability or physical injury (Laura M Stough, 2010).

- The suffering of the individual as a result of genetic or environmental factors from a physical or mental deficiency that results in economic, social or psychological effects that prevent him from learning or performing some mental or sensuality operations (William Curran, 2016).

- Movement Disability:

- Disability that affects the bones or muscles, and leads to a disability in the movement of the limbs to carry out their movement functions normally, which requires the availability of specialized services and devices that enable him to move, and help him in practicing a normal life (Rtnesh Kumar, 2001).

- A defect or disability that affects the nervous, muscular or skeletal system, which makes the person unable to carry out his movement functions in an appropriate manner (Kathy Al Ju'beh, 2017).

- Acquired Movement Disability:

- Among the health problems that the individual is exposed to due to some chronic problems that lead to physical disabilities and a profound imbalance in their physical, psychological and social well-being, and the inability to adapt positively with the environment around him (B.A. Tallman and A.C. Hoffman, 2017)).

Research hypotheses:

- 1- There are statistically significant differences among the eight designs in achieving the aesthetic aspect according to the specialists' opinions.
- 2- There are statistically significant differences among the eight designs in achieving the functional aspect according to the specialists' opinions.
- 3- There are statistically significant differences among the eight designs according to the specialists' opinions.

Research methodology:

The research follows:

- The descriptive approach using the content analysis method "**Content Analysis**", and it relies on an organized and accurate description of the subject and purpose of the study and identifying the study sample to study its content and analyze it with the application of the work of the proposed women's designs that are evaluated by a group of specialists in the field of clothing and textiles.

Research sample: eight suggested designs for people with movement disabilities in the lower half resulting from knee fractures to achieve the aim of the study.

Research tools:

Questionnaire:

The researcher designed a questionnaire to evaluate the suggested designs for the handicapped females who with an acquired movement disability in the lower part as a result of a knee fracture, and the questionnaire consisted of two axes:

- The first axis: achieving the aesthetic aspect, and it included “8” phrases.
- The second axis: achieving the functional aspect, and it included “8” phrases.

The researcher used a triple scale to answer the items by choosing one of chooses (agree, to some extent, disagree).

Research limits:

Spatial limits: Jeddah Governorate.

Human limits: a group of women in the age stage (30-40).

Time limits: the time period from the year 2022 AD

Objective limits: Clarifying the psychological, educational and social characteristics of the temporarily movement disabled females in the lower half resulting from fractures, and shedding light on the foundations and standards that must be available in the clothing of the temporarily movement disabled females in the lower part due to knee fractures in order to provide comfort and safety for them.

Theoretical framework:

Movement disability is considered a physical and health problem, regardless of the age stage in which it occurred, or the reasons that it resulted from, whether they were congenital or acquired, and the latter mostly occurs as a result of various environmental factors. The disability results in many psychological and social problems, which requires intervention and care from the psychological and social aspects, as well as qualifying from physically aspects, this makes the disabled person accept his disability and adapt to it.

Movement disability:

They are the cases of individuals who suffer from some defect in their movement ability or movement activity, where this defect affects the aspects of their mental and emotional development (William Curran, 2016).

Causes of movement disability:

• **Genetic causes:** Are those that are transmitted from generation to generation due to the hereditary genes (Rana Awwad, 2007 AD).

• **Environmental causes:** It is represented in the environment surrounding individuals, and it goes along with genetic factors and interacts with them (Elizabeth McAdams, Laura M. Stough, 2011).

Acquired movement disability:

The acquired movement disability results from various accidents that the individual is exposed to in the environment in which he lives, and it may be one of the injuries or complications resulting from various diseases (Timothy R, Elliott, 2002).

Temporary acquired movement disability resulting from a knee fracture:

Knees problems are common because it is a weak area of the body, as it bears the full weight of the body and an additional burden during work, so some accidents or movements lead to fractures in the knee, which causes a disability in movement and prevents a person from practicing his normal life, and knee fractures represent 1% of all types of fractures (www.ncbi.nlm.nih.gov).

Clothing problems that faced by the females who with movement disabled in the lower half due to knee fractures:

- There is a shortage of available outerwear that combines beauty, attractiveness, and functionality for woman who is with movement disabled in the lower half due to knee fractures. Therefore, their clothing needs of outerwear must be determined in order to design and produce suitable clothes for them.
- The needs of the females with movement disabled in the lower half due to knee fractures lie in the lack of ready-made clothes that suit the type of disability in the lower part, and be suitable for the presence of external fixators for the knee, which affects her communication with others and her social activity.
- Sizes of the ready-made clothes available in the local markets are not suitable for the disability of the lower half, because most of them are tight-fitting or tight because of the device used to fix the knee, and they may be very tight in the knee area, and therefore the disabled find it difficult to put them on and take them off, so they cannot practice their daily life activities.
- The construction of the pattern of ready-made clothes is often complicated, which leads to the clothes intertwining with the external fixator for the knee, and thus they lack the clothing safety.
- The design of the available clothes is not attractive in terms of color and design for women in the age stage of 20-40 years, because most of them are clothes that tend to be suitable for the elderly and do not keep pace with modern fashion trends, so they are not suitable for this age stage, which is characterized by vitality, beauty and femininity.
- Clothing designs may obstruct movement and cause discomfort to the wearer, so he does not feel comfortable in clothing for females who with movement disabled in the lower part as a result of knee fractures, which causes difficulty in moving.
- Design elements "line, color, material, shape" are not all available in one ready-made design
- The designs available in the local markets are not characterized by unity among the design elements, which leads to the handicapped not wanting to wear them.
- The quality of the fabrics which the ready-made clothes are made from highlights the handicap more and does not hide it because it is made of shiny or very soft fabrics that may tear easily when put on and taken off with the presence of the external fixator for the knee.

- Clothing designers ignore this category of people with special needs, which leads to the lack of beautiful functional clothes suitable for the females with movement disabled in the lower part as a result of knee fractures.

Standards that must be available in clothes of the females with acquired movement disabled in the lower part as a result of knee fractures:

Choosing the appropriate design:

Clothing design is divided into:

- **Structural design:** It is the basis of creativity and innovation in clothing design, as it is based on assembling the structural details together, which includes stitching, colors, fabric, details and lines of clothing parts.
- **Decorative design:** It is concerned with the aesthetic form of the design, and includes everything related to decorating and modifying the structural design, and it does not enter into the basis of the design, because it is an addition on the structural design through the use of embroidery and others (Lo'loit Gharam Alghamdi, 2004 AD).

The structural clothing design changes the shape and corrects the defects and errors of the body, and the decorative design adds attractiveness and beauty to the shape of the clothing and the individual's body (Latifah Manaji, 2015 AD).

And when choosing a design suitable for the females with movement disabled in the lower part as a result of knee fractures, the designs must be characterized by the following:

- The design of clothing must combine both aesthetic and functional aspects.
- The design should be attractive and comfortable, suitable for the type of disability.
- In the pants designs, it is required that there is a width and increase in the pants in the lower part at the knee so that it is easy to put on and take off, and they do not put pressure on the knee fixation device.
- Design lines should be simple to ensure comfort and freedom of movement.
- It is required to be long and wide in order to hide the fixation device that existing on the knee.
- The design should be easy to put on and take off.
- Putting pockets or decorations in the lower part so that the design hides the disability and creates a kind of optical deception.
- Avoid the many layers in the design so as not to hinder the movement of the female disabled.
- When designing the pants, they must be opened from the inner or outer leg by means of adhesive tape or the zipper or by using buttons so that it is easy for the female disabled to take them off easily.
- Designs should be modern, fashionable and suitable for the disability.

Standards that must be available in the quality of fabrics suitable for the females with acquired movement disabled in the lower part as a result of knee fractures:

- Clothing fabrics are preferred to be of medium thickness, not light and easily torn due to the knee fixation device, and not thick that lead to high body temperature, which leads to inflammation and ulcers in the knee and leg, so the soft cotton fabrics are preferred.
- Fabrics are required to be porous and well-ventilated so as not to lead to inflammations.
- Fabrics must absorb sweat so as not to raise body temperature and make the female handicapped feel uncomfortable.
- Choosing fabrics and materials that have both functional and aesthetic characteristics. The functional characteristics include thermal properties, durability, and thermal balance.
- Wrinkle resistance so as not to cause aesthetic problems for clothes in the lower part.
- The fibers that make up the fabric must be natural, soft and not coarse so as not to cause sensitivity to the knee.

Clothing safety:

Clothing safety is one of the conditions that must be available in the clothes of the females handicapped through the use of fabrics that are characterized by high strength, in order to withstand friction and not tear easily due to the presence of a knee fixation device. In order to provide clothing safety, the width of the clothes must be appropriate, so that they are not too wide to cause them to fall, and they are not too tight so that the clothes do not tear or that may lead to difficulty in the movement.

We also can add some treatment to the clothes in order to gain more clothing safety, such as treating the fabrics against microorganisms in order to prevent the unpleasant smell that arises from sitting for long periods (Harriet Meinander and Minna Varheenmaa, 2013).

Sincerity and Reliability

A questionnaire of evaluating the suggested designs:

Sincerity of the questionnaire:

It means the ability of the questionnaire to measure what it was put to measure it.

Sincerity of the internal consistency:

- 1- Calculating the correlation coefficients between the degree of each phrase of the phrases that make up each axis, and the total degree of the axis in the questionnaire.
- 2- Calculating the correlation coefficients between the total degree for each axis of the questionnaire and the total degree in the questionnaire.

The first axis: achieving the aesthetic aspect:

Sincerity has been calculated using internal consistency by calculating the correlation coefficient (Pearson correlation coefficient) between the degree of each phrase and the degree of the axis (**achieving the aesthetic aspect**), and the following table shows that:

Table (1) values of the correlation coefficients between the degree of each phrase and the degree of the axis (achieving the aesthetic aspect)

S	Correlations	Significance
1-	0.759	0.01
2-	0.640	0.05
3-	0.958	0.01
4-	0.781	0.01
5-	0.816	0.01
6-	0.625	0.05
7-	0.603	0.05
8-	0.896	0.01

It is clear from the table that all the correlation coefficients are significant at the level (0.01-0.05) because they are close to the whole one, which indicates the validity and homogeneity of the questionnaire phrases.

The second axis: achieving the functional aspect:

Sincerity has been calculated using internal consistency by calculating the correlation coefficient (Pearson correlation coefficient) between the degree of each phrase and the degree of the axis (**achieving the functional aspect**), and the following table shows that:

Table (2) values of the correlation coefficients between the degree of each phrase and the degree of the axis (achieving the functional aspect)

S	Correlations	Significance
1-	0.840	0.01
2-	0.735	0.01
3-	0.802	0.01
4-	0.618	0.05
5-	0.777	0.01
6-	0.921	0.01
7-	0.632	0.05
8-	0.606	0.05

It is clear from the table that all the correlation coefficients are significant at the level (0.01-0.05) because they are close to the whole one, which indicates the validity and homogeneity of the questionnaire phrases.

Sincerity by using the internal consistency between the total degree of each axis and the total degree of the questionnaire:

Sincerity has been calculated using internal consistency by calculating the correlation coefficient (Pearson correlation coefficient) between the total degree of each axis (**achieving the aesthetic aspect, achieving the functional aspect**) and the total degree of the questionnaire, and the following table shows this:

Table (3) values of the correlation coefficients between the total degree of each axis and the total degree of the questionnaire

	Correlations	Significance
The first axis: achieving the aesthetic aspect	0.718	0.01
The second axis: achieving the functional aspect	0.855	0.01

It is clear from the table that all the correlation coefficients are significant at the level (0.01) because they are close to the whole one, which indicates the validity and homogeneity of the questionnaire axes.

Reliability:

Reliability means the accuracy of the application in the measurement and observation, and it does not a contradiction with itself, and its consistence with what it providing us with information about the examiner's behavior, and it is the ratio between the variance of the degree on the questionnaire that indicates the actual performance of the examiner, and the reliability has been calculated by:

- 1- Alpha Cronbach coefficient
- 2- Split-half method

Table (4) values of the reliability coefficient of the specialists' questionnaire axes

Axes	Alpha coefficient	Split-half
The first axis: achieving the aesthetic aspect	0.774	0.731 – 0.802
The second axis: achieving the functional aspect	0.915	0.876 – 0.945
Reliability of the questionnaire as whole	0.869	0.822 – 0.890

It is clear from the previous table that the all values of the reliability coefficients: the Alpha coefficient, the Split-half are significant at the level of 0.01 and that indicates the reliability of the questionnaire.

The applied framework of research :

Suggested design visions for some people with acquired movement disabilities in the lower half resulting from knee fractures:

The researcher designed "8" suggested designs in the age group "30-40" for the females handicapped who with acquired movement disability in the lower part as a result of knee fractures, and developed a set of solutions to the clothing problems that the female handicapped suffers from and faces when buying personal clothes that she wears during the period of disability.

The first suggested design:

Description of colors and fabrics in the suggested design

The suggested design consists of two pieces, a blouse and pants. The blouse is designed from natural silk fabric in a bright pink color that gives happiness and hope. The natural silk fabric has a natural luster that adds a kind of beauty and vitality to the design. Its surface is characterized by richness and luxury in appearance, with a zipper that can be opened easily, and the lower part is wide pants with wide longitudinal pleats, and the pleats are a fold that fixes a specific area of the fabric, and it was used functionally to give breadth and ease for movement, and the pants were made of heavy fabric in order to ensure the availability of clothing safety and heating for the lower part of the body, and to increase the provision of the element of comfort and ease of wearing and taking off, a hidden zipper was added on both sides from the waist to the end, and the color of the pants is dark blue wavy in order to reduce the size of the body in the lower part, and a kind of deception occurs that hides the disability in the knee through the dark color.



The second suggested design:

Description of colors and fabrics in the suggested design

The suggested design consists of a light red chiffon blouse that gives vitality and freedom while preserving the aesthetics of the outfit in order to give the handicapped a kind of self-confidence and psychologically support her to communicate with the surrounding community and not be isolated. The blouse was designed from lightweight chiffon fabric and a plain weave woven from thin threads of cotton, and the blouse is embroidered with decorative units on the chest and sleeves to give the design a kind of luxury, with buttons in the front that give comfort in wearing, while the lower part of the design is a thin jersey skirt that fits with the thin, soft and calm drop-down folds on the body, and it is plaid with beautiful spring colors, and it is designed of four pieces, in each piece there is a gradient band that increases little by little to give breadth to the design in the lower part, and achieve simplicity in the pattern to provide safety and clothing comfort for the



female handicapped.

The third suggested design:**Description of colors and fabrics in the suggested design**

The suggested design consists of two pieces, a two-layer blouse, a long-sleeved top and a gray color of dupion silk fabric that flows over the body and its folds are bold, attractive and lightweight.

The upper part of the blouse is made of plain fabric, while the second layer of the blouse is plaid with natural roses of beautiful movement and vitality.

The pants are made of gray crepe fabric, wide at the bottom, and are characterized by the presence of side openings and buttons in the front in the center of each leg in order to add a utilitarian benefit and make it easy to put on and take off.

Adding an aesthetic touch to the pants, and they can be opened and taken off when needed.

**The fourth suggested design:****Description of colors and fabrics in the suggested design**

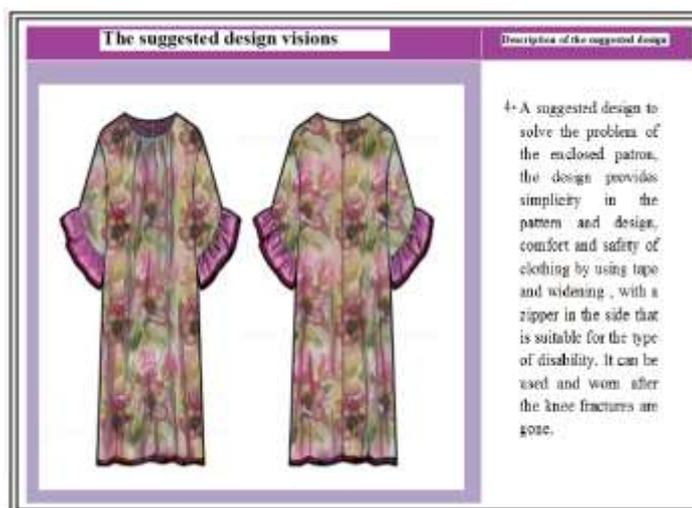
The suggested design is a simple, wide dress with tape in the front and back, and wide sleeves

It is a design with simple idea, and the design based mainly on soft fabric that flows smoothly, and is wooded with drawings of natural flowers that give the design a kind of visual rhythm up and down.

There is also a zipper from top to bottom in the center back area, so that it is easy to put on and take off

The wideness of the dress helps to hide the disability in the lower part resulting from fractures in the knee

The fabrics are soft, drop-down and comfortable



The fifth suggested design:**Description of colors and fabrics in the suggested design**

The suggested design is suitable for going out, as it consists of two pieces, a blouse and pants, made of plaid fabric with natural ornamentation, and the design is based on light, spacious fabrics. The blouse is accurate on the chest area, with the chest area decorated with a tape that adds beauty to it, and it is made up of combining plain and plaid fabric so that there are ruffles on the chest area, and the sleeves are well-fitted from the beginning of the arm to the elbow area, and they end with layers from the cuff to the end of the arm, and the pants are wide and plaid, with a zipper on both sides from the waist to the end of the leg, and the dark-colored plaid fabric helps to hide the defects of disability and adds beauty to the disabled female, and it achieves the economic aspect because it can be worn after the removal of the health impediment.



3- A suggested design for the females movement disabled who seat on chair due to temporary knee fractures, it provides comfort in the pattern, and the use of zippers to achieve comfort and safety in clothing. It can be used and worn after the knee fractures are gone.

The sixth suggested design:**Description of colors and fabrics in the suggested design**

The suggested design is a dress for going out, consisting of a blouse and pants, the colors of which are consistent with each other, the blouse has an empire waist cut in the armpits, the opening of the blouse in the front in the form of buttons on the half-front line, and ruffles on the shoulder and around the neck and cuff with buttons. The blouse is made of light green fabric, and the pants are wide and plaid with spring flowers, with a zipper on both sides from the waist to the end of the leg. The wide pants hide the knee fixation device, and give ease of putting on and taking off while maintaining comfort and safety in clothing, and there is consistency in the fabric and colors between the blouse and the pants.



6- A suggested design for the females movement disabled who seat on chair due to temporary knee fractures, it provides comfort in the pattern by making a widening at the bottom to achieve comfort and safety in clothing, and easy to put on and take off. It can be used and worn after the knee fractures are gone.

The seventh suggested design:**Description of colors and fabrics in the suggested design**

The design is a jumpsuit with holes in the lower inner part of the jumpsuit, and the opening starts from the beginning of the right leg and ends at the end of the left leg, and the upper part of the design is a corset with check fabric made of cotton, which is characterized by high elasticity and porosity to give the disabled a sense of physical thermal balance, and the lower part of the jumpsuit is made of wide jeans fabric until it covers the shape of the fixation device in the knee, with a hidden zipper inside the jumpsuit so that it is easy to put on and take off the jumpsuit, and the design was decorated with a bow on the middle of the front in the chest area.

**The eighth suggested design:****Description of colors and fabrics in the suggested design**

The suggested design consists of two pieces, a skirt and a blouse. The blouse is in gray color that helps to hide the defects of movement disability in the lower part as a result of a knee fracture. The blouse has long sleeves that end with a cuff and buttons made of gray check fabric, with a tape of check fabric that wraps around the neck, and ends with a bow in the front. The fabric of the blouse is made of Jersey that falls smoothly and beautifully on the body, and the lower part of the design is a skirt made of gray check fabric with longitudinal pleats in the knee fracture area to give comfort to the disabled female. The skirt was decorated with fasteners consisting of a small belt that adds beauty to the design, and it is also possible to open it and increase the width of the pleats or gather them so that they can be used after the health symptom is gone.

**Research results:****The first hypothesis:**

"There are statistically significant differences among the eight designs in achieving the aesthetic aspect according to the specialists' opinions".

To investigate this hypothesis, an analysis of variance was calculated for the mean degrees of the eight designs in achieving the aesthetic aspect according to the specialists' opinions, and the following tables show that:

Table (5) an analysis of variance for the mean degrees of the eight designs in achieving the aesthetic aspect, according to the specialists' opinions

Achieving the aesthetic aspect	Sum of Squares	Squares mean	Degrees of freedom	Value of (F)	Sig.
Among groups	3902.086	557.441	7	56.787	0.01 Sig.
Within groups	706.783	9.816	72		
Sum	4608.869		79		

Table (5): shows that the value of (F) was (56.787), and it is a statistically significant at the level (0.01), which indicates the existence of differences among the eight designs in achieving the aesthetic aspect, according to the specialists' opinions, and to know the direction of the significance, the test of LSD for the multiple comparisons was applied. The following table shows this:

Table (6) test of LSD for the multiple comparisons

Achieving the aesthetic aspect	The first design M= 28.535	The second design M= 39.338	The third design M= 26.215	The fourth design M= 21.402	The fifth design M= 17.472	The sixth design M= 36.436	The seventh design M= 32.000	The eighth design M= 33.396
The first design	-							
The second design	10.803**	-						
The third design	2.320*	13.123**	-					
The fourth design	7.133**	17.936**	4.813**	-				
The fifth design	11.063**	21.866**	8.743**	3.930**	-			
The sixth design	7.901**	2.902*	10.221**	15.034**	18.964**	-		
The seventh design	3.465**	7.338**	5.785**	10.598**	14.528**	4.436**	-	
The eighth design	4.861**	5.942**	7.181**	11.994**	15.924**	3.040**	1.396	-

** significant at 0.01

* significant at 0.05

without stars not significant

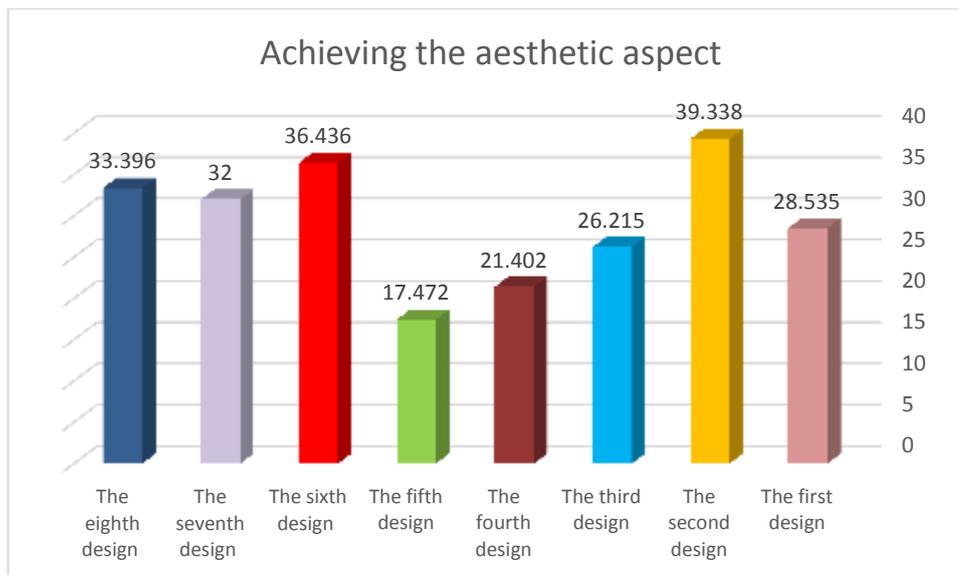


Figure (1) shows the mean degrees of the eight designs in achieving the aesthetic aspect according to the specialists' opinions

From table (6) and figure (1), it is clear that:

- 1-There are statistically significant differences among the eight designs at the significance level of 0.01, so we find that the design "2" was the best design in achieving the aesthetic aspect according to the specialists' opinions, followed by the design "6", then the design "8", then the design "7", then the design "1", then the design "3", and finally the design "5".
- 2-Also, there are differences at the significance level of 0.05 between the design "1" and the design "3" in favor of the design "1". Also, there are differences at the significance level of 0.05 between the design "2" and the design "6" in favor of the design "2".
- 3- While there aren't differences between the design "7" and design "8".

The second hypothesis:

"There are statistically significant differences among the eight designs in achieving the functional aspect according to the specialists' opinions".

To investigate this hypothesis, an analysis of variance was calculated for the mean degrees of the eight designs in achieving the functional aspect according to the specialists' opinions, and the following tables show that:

Table (7) an analysis of variance for the mean degrees of the eight designs in achieving the functional aspect according to the specialists' opinions

Achieving the functional aspect	Sum of Squares	Squares mean	Degrees of freedom	Value of (F)	Sig.
Among groups	3964.374	566.339	7	31.510	0.01

Within groups	1294.062	17.973	72		Sig.
Sum	5258.436		79		

Table (7): shows that the value of (F) was (31.510), and it is a statistically significant at the level (0.01), which indicates the existence of differences among the eight designs in achieving the functional aspect, according to the specialists' opinions, and to know the direction of the significance, the test of LSD for the multiple comparisons was applied. The following table shows this:

Table (8) test of LSD for the multiple comparisons

Achieving the functional aspect	The first design M= 24.660	The second design M= 26.937	The third design M= 21.344	The fourth design M= 30.354	The fifth design M= 18.699	The sixth design M= 38.064	The seventh design M= 34.200	The eighth design M= 16.576
The first design	-							
The second design	2.277*	-						
The third design	3.315**	5.592**	-					
The fourth design	5.694**	3.417**	9.009**	-				
The fifth design	5.961**	8.238**	2.645*	11.655**	-			
The sixth design	13.404**	11.127**	16.719**	7.710**	19.365**	-		
The seventh design	9.540**	7.263**	12.855**	3.846**	15.501**	3.864**	-	
The eighth design	8.084**	10.361**	4.768**	13.778**	2.123*	21.488**	17.624**	-

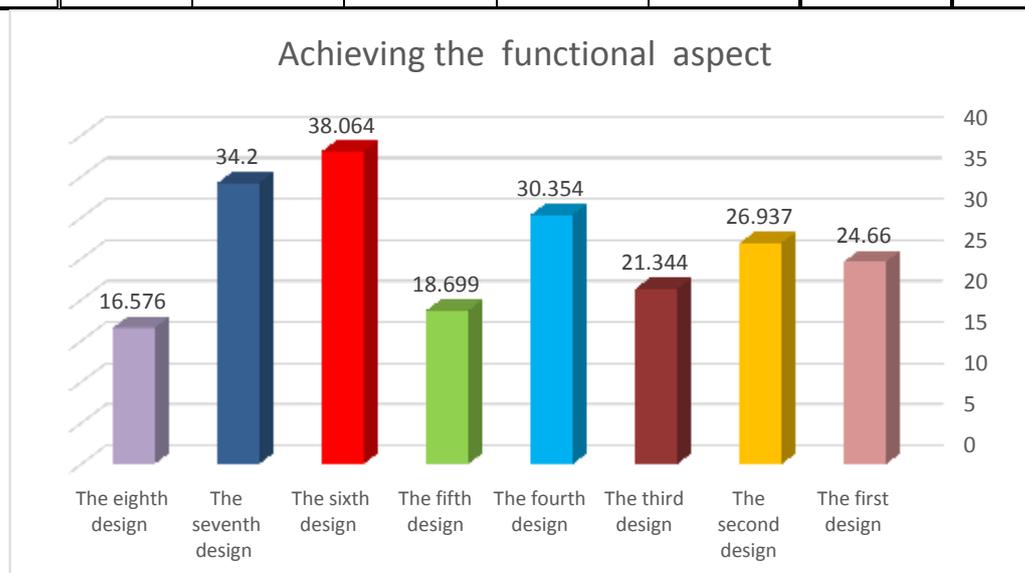


Figure (2) shows the mean degrees of the eight designs in achieving the functional aspect according to the specialists' opinions

From table (8) and figure (2), it is clear that:

1-There are statistically significant differences among the eight designs at the significance level of 0.01, so we find that the design "6" was the best design in achieving the functional aspect according to the specialists' opinions, followed by the design "7", then the design "4", then the design "2", then the design "1", then the design "3", then the design "5", and finally the design "8".

2-Also, there are differences at the significance level of 0.05 between the design "1" and the design "2" in favor of the design "2". Also, there are differences at the significance level of 0.05 between the design "3" and the design "5" in favor of the design "3". Also, there are differences at the significance level of 0.05 between the design "5" and the design "8" in favor of the design "5".

The third hypothesis:

"There are statistically significant differences among the eight designs according to the specialists' opinions".

To investigate this hypothesis, an analysis of variance was calculated for the mean degrees of the eight designs according to the specialists' opinions, and the following tables show that:

Table (9) an analysis of variance for the mean degrees of the eight designs according to the specialists' opinions

The total sum " The specialists"	Sum of Squares	Squares mean	Degrees of freedom	Value of (F)	Sig.
Among groups	10741.134	1534.448	7	47.657	0.01 Sig.
Within groups	2318.240	32.198	72		
Sum	13059.374		79		

Table (9): shows that the value of (F) was (47.657), and it is a statistically significant at the level (0.01), which indicates the existence of differences among the eight designs according to the specialists' opinions, and to know the direction of the significance, the test of LSD for the multiple comparisons was applied. The following table shows this:

Table (10) test of LSD for the multiple comparisons

The total sum " The specialists"	The first design	The second design	The third design	The fourth design	The fifth design	The sixth design	The seventh design	The eighth design
M= 53.195	M= 53.195	M= 66.275	M= 47.561	M= 51.756	M= 36.171	M= 74.500	M= 66.200	M= 49.972
The first design	-							
The second design	13.080**	-						

The third design	5.634**	18.714**	-					
The fourth design	1.439	14.519**	4.195**	-				
The fifth design	17.024**	30.104**	11.390**	15.585**	-			
The sixth design	21.305**	8.225**	26.939**	22.744**	38.329**	-		
The seventh design	13.005**	0.075**	18.639**	14.444**	30.029**	8.300**	-	
The eighth design	3.223**	16.303**	2.411*	1.784	13.801**	24.528**	16.228**	-

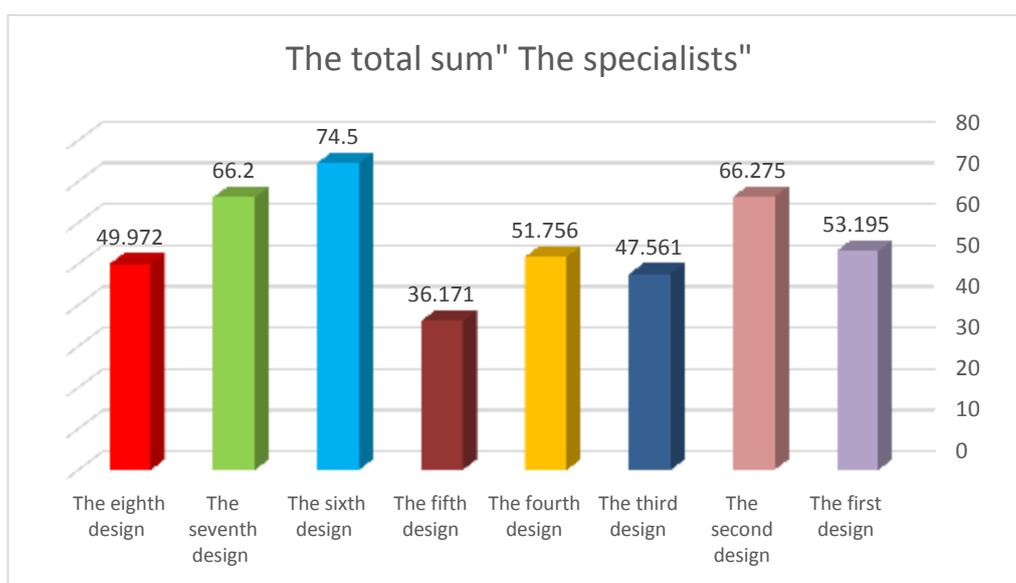


Figure (3) shows the mean degrees of the eight designs according to the specialists' opinions

From table (10) and figure (3), it is clear that:

1- There are statistically significant differences among the eight designs at the significance level of 0.01, so we find that the design "6" was the best design according to the specialists' opinions, followed by the design "2", then the design "7", then the design "1", then the design "4", then the design "8", then the design "3", and finally the design "5".

2- Also, there are differences at the significance level of 0.05 between the design "3" and the design "8" in favor of the design "8".

3- While there aren't differences between the design "1" and design "4", and there aren't differences between the design "2" and design "7", and there aren't differences between the design "4" and design "8".

Recommendations:

1- It is necessary to interest with providing the clothing needs for the females with movement disabled in general and the females with movement disabled in the lower part due to knee fractures in particular.

2- Holding awareness-raising lectures and seminars about the importance of types of clothing those are suitable for the females with movement disabled in the lower part due to knee fractures.

- 3- Encouraging the females with movement disabled in the lower part due to knee fractures to communicate with the society around them in order to form friendships.
- 4- Integrating the females with movement disabled into society so that the female disabled can enjoy a life similar to normal life, like all individuals of society.

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