

A Standard Sizing System for Garments based on Anthropometric Statistics of Ghanaian Girls aged Six to Twelve

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Abstract

The general objective of the study was to develop a standard sizing system using the anthropometric statistics of Ghanaian pre-teen girls. Specifically, it determined: key dimensions, size intervals, and created a size chart for Ghanaian pre-teen girls. It adopted an experimental design. It was conducted in the Greater Accra Region of Ghana. Population consisted of all pre-teen girls in the area of the study. Thirty-two (32) body dimensions were measured based on anthropometric measurement protocols, specified in International Organization for Standardization (ISO) 8559 (2017; 2018). Pearson's correlation coefficient was employed for determining relationships among body dimensions, based on the British Standard Institution (BSI) standard 7231 (BSI, 1990) related to clothing. Four key dimensions; namely height, bust, waist, and hip were identified. Size intervals were height - 6.0, bust - 3.0, waist - 2.0, and hip - 3.5 and size designation was based on age and height, with three size variations; small, medium and large. The size chart offers essential anthropometric attributes that are of utmost importance for local and international manufacturers, enabling them to effectively meet the sizing and fit needs of the expanding children's wear market.

Keywords: Anthropometry, Fit, Chart, Garments, Pre-teens, Girls, Standard, Sizing, System.

Introduction

Anthropometry encompasses the scientific measurement of human body dimensions. Anthropometric surveys serve as reliable tools for assessing human populations (Almousa, 2021; Erkan, 2020). These surveys yield invaluable data for ergonomics, aiding in the determination of physical measurements for workplaces, equipment, and clothing to prevent

discrepancies between human dimensions and product specifications (Widyanti et al., 2017; Erkan, 2020). Anthropometric data contributes to global uniformity in clothing production and assists in addressing fit issues in ready-to-wear garments (Almousa, 2021). Such data also facilitates the establishment of reliable sizing standards to meet the clothing requirements of specific populations (Bari

et al., 2015; Almousa, 2021). Anthropometric studies have, thus become a basis for obtaining garment sizes for solving size and fit issues of various populations (Almousa, 2021). A sizing system classifies body measurements, and is usually presented as a size chart, consisting size groups that describe the various sizes and shapes of a given population (Zakaria, 2016). Sizing systems typically utilize key dimensions, size intervals and size designation (ISO 8559, 2018; Bizuneh et al., 2025), and are presented as size charts.

One demographic group often overlooked in terms of garment size and fit is children (Zakaria, 2016; Sowah 2020). The fashion industry is however, increasingly shifting its focus toward children's clothing due to the growing global interest in children's fashion (Zakaria, 2016; Prabhakar & Rajagopal, 2023). Children's clothing play a significant role in shaping their self-image as they progress through various stages of growth (Zakaria, 2016; Prabhakar & Rajagopal, 2023). Therefore, accurate fit is of significant importance for children's development, particularly given their rapid physical growth (Widyanti et al., 2017), resulting in various anthropometric characteristics (Huyssteen, 2006). The dynamic changes in children's bodies lead to greater size variations, potentially causing fit problems if not properly considered. Hence, the distinctive body characteristics of children at each stage must be taken into account when addressing the fit of children's clothing.

Pre-teen children, typically ranging from 6 to 12 years old, experience significant growth in body girth and height (Aldrich, 2012; Zakaria, 2016). Pre-

teen girls encounter fit-related challenges when selecting ready-to-wear clothing because of the noticeable shifts in body shape as they transition toward adolescence (Aldrich, 2012; Sowah, 2020). For instance, girls' garment sizes are more complex than boys' sizes because their hips and busts grow faster than their waists, resulting in the development of hourglass figure (Sowah, 2020; Twum, 2023). Consequently, pre-teen children require additional care and attention, both psychologically and physically (Zakaria, 2016; Sowah, 2020).

Studies on anthropometric measurements of children have been limited (Etier et al., 2021). While some anthropometric surveys have been conducted to develop clothing sizes for children, most of the studies have primarily focused on children from developed countries, with limited research in Africa (Bizuneh et al., 2025). Only a few studies have developed size charts for children in Sub-Saharan Africa. For instance, Otieno & Fairhurst (2000) conducted a study with 618 Kenyan pre-school girls to develop a clothing size chart, revealing fit challenges in areas like the bust, waist, hips, and leg length among these girls. Huyssteen (2006) surveyed 2 to 14 years old children in South Africa for the development of fit dummies. Other studies involved; 6 to 10-year-old Sudanese Indonesian children (Widyanti et al., 2017), and Ethiopian children (Alubel et al., 2017). Few surveys on pre-teen children featured children in Croatia (Hrženjak et al., 2013) and Malaysia (Zakaria, 2016). The studies so far, revealed significant variations in children's measurements particularly pre-teens, across different populations.

Despite the significance of anthropometric surveys, there has not been any official clothing anthropometric survey in Ghana to establish a national size chart for the Ghanaian population, including children (Biney-Aidoo et al., 2023; Twum, 2023). Nevertheless, there has been a notable increase in the population of Ghanaian children (Ghana Statistical Service (GSS), 2021). The Garment and Textile industry in Ghana employs a substantial portion of the population and offers a significant source of livelihood. However, Ghanaian garment manufacturers often rely on foreign sizing systems, such as British (UK) and American (US) charts, to produce clothing for Ghanaian children (Biney-Aidoo et al., 2023). This approach frequently results in ill-fitting garments, causing dissatisfaction among consumers (Prabhakar & Rajagopal, 2023; Bizuneh et al., 2025).

The issue of fit dissatisfaction may even be more complex in the case of children because, many garment manufacturers have difficulties determining children's sizes (Twum, 2023). Meanwhile, there is currently, an increasing demand for ready-to-wear garments among Ghanaians recently (Biney-Aidoo et al., 2023), consequently, there is now increasing business activities in the fashion industry. Therefore, it is important to have localized size charts for accurate sizing (Chen et al., 2023). Examining the body sizes of children within the sub-region is vital for product design and comparative purposes, and should not be overlooked on the global stage. An anthropometric survey of Ghanaian children aims to bridge the knowledge gap, particularly in light of the dearth of empirical literature from a Sub-

Saharan African perspective (Fabea et al., 2024), by investigating the body sizes of Ghanaian pre-teen children.

Objectives of the Study

The general objective of the study was to develop a standard sizing system using the anthropometric statistics of Ghanaian pre-teen girls. Specifically, the study:

1. determined key body dimensions of Ghanaian pre-teen girls;
2. determined size intervals of key dimensions of Ghanaian pre-teen girls; and
3. created a size chart for Ghanaian pre-teen girls.

Methodology

Design of the Study: The experimental research design was adopted for the study. Anthropometric measurements were collected, key dimensions were established based on correlation, thereafter the measurements were processed into garment sizes and size categories.

Area of Study: The study was conducted in the capital region of Ghana, Greater Accra, which is known for its cosmopolitan nature, reflecting people from all ethnic groups. The Accra Metropolis and Ga East Municipal districts were the target areas to represent rural and urban areas respectively, as anthropometric characteristics are influenced by socioeconomic backgrounds (Das et al., 2016).

Population for the Study: The population consisted of all pre-teen Ghanaian girls in the study area. Preteen girls have uniquely rapid body growth trends (Zakaria, 2016; Prabhakar & Rajagopal, 2023), and experience puberty about two years earlier

than boys (Twum, 2023). Additionally, pre-teen girls' bodies develop differently in response to hormonal changes as compared to boys, resulting in hourglass shape (Sowah, 2020; Twum, 2023). A separate size chart is thus, necessary, as well as more size variations (Aldrich, 2012; Hrženjak et al., 2013; Bizuneh et al., 2025). Population of pre-teen girls in the study area was 381, 677 (Ghana statistical service {GSS, 2021}).

Sample for the Study: A total of 707 pre-teen were sampled for the study. Studies have shown that a sample of between 500 and 1000 is considered adequate to be representative of a population, and for meaningful results (Bizuneh et al., 2025). The sampling procedure was planned to ensure a fair representation of girls aged 6 to 12 years, from public and private basic schools, within the rural and urban areas of the region.

A multi-stage sampling approach was therefore employed. Two sub-metropolitan areas; Korley Klottey and Abokobi were randomly selected from the Accra Metropolis and the Ga East Municipal districts respectively. Within these areas, seven public and four private basic schools were sampled from 23 public and 16 private schools respectively, using proportionate stratified random sampling technique to ensure representation across both contexts. A non-proportionate stratified sampling method was used to select roughly 10 girls from each age group (6, 7, 8, 9, 10, 11, and 12 years) from each school. The selection of the required number of girls from each age stratum was not random. It was based on willingness to participate.

Instrument for Data Collection: The instrument for data collection included: a

stadiometer for measuring height; digital weighing scale for weight; and measuring tape for taking body measurements. The materials used included elastic tapes and white circular sticky papers for land marking parts of the body for measurement, and measuring kits (strapless body tubes worn over the breast, and under shorts worn over panties).

Data Collection Procedures: Manual measurement method was employed, for practicality and cost-effectiveness. Measurements were taken, following the guidelines set by ISO standards 8559 (2017) and research by Huyssteen (2006). The recommendations and precise instructions regarding the instruments, materials, landmark positions, and procedures required for manual anthropometric surveys were observed. The measurements were taken with the assistance of ten trained research assistants who followed a standardized measuring protocol. Data were collected as follows:

Preparation of Subjects for Measurement: Each girl (subject) was helped to change into measuring kits. Elastic tapes were tied around the bust, waist, and hip, as landmarks, for measuring accuracy and consistency. The rest of the measuring positions were marked with white circular sticky papers, marked at the center. The stickers were placed at the beginning and end of each measuring position, to ensure consistency.

Measurement Taking Procedures: All measurements were taken from the right side of the subject, with the subject bare footed, and standing upright and in most cases. During measuring procedure, the instruments were assessed periodically to confirm their consistency in performing their respective functions. A total of 32

dimension of measurement were taken (Table 1).

All measurements were taken in centimeters (cm), except weight which was measured in kilograms (kg), and recorded using special recording sheets designed for the purpose.

Data Analysis Techniques: To establish the relationships among various body dimensions and select key dimensions, Pearson's correlation technique was employed. The correlation coefficient values for determining relationships among body dimensions adhered to the

BSI 7231 (BSI, 1990) standard. According to this standard, a correlation coefficient value of less than 0.5 indicates a weak relationship, a value between 0.5 and 0.75 signifies a moderate relationship, and 0.76 or higher indicates strong relationship. The mean measurements were utilized as preliminary values for the creation of the size chart, as found in similar studies. Size intervals were based on approximated averages of size widths, used to normalize the measurements (ISO 8559, 2018).

Results

Table 1: Key Dimensions of Ghanaian Pre-Teen Girls based on Correlation

S/ N	Dimensions	Mean measurements (MM)							Correlation BSI 7231 (1990)
		6	7	8	9	10	11	12	
1.	Age (years)								0.62
2.	Weight	18.5	22.5	25.5	29.5	34.0	35.0	41.0	0.76*
3.	Height	116.	121.5	127.5	133.5	139.0	143.0	150.	0.77*
4.	Waist to ground	73.5	76.5	81.5	86.5	91.0	93.5	99.0	0.72
5.	Back neck point to ground	97.0	100.5	106.5	111.5	117.0	120.0	126.	0.75
6.	Back neck point to wrist	55.0	57.0	60.0	64.0	66.0	68.0	72.5	0.75
7.	Arm length	43.5	45.0	47.0	50.0	52.5	54.5	57.5	0.74
8.	Underarm length	31.5	33.0	34.5	36.5	38.0	39.5	42.0	0.66
9.	Back neck point to waist:	24.5	25.0	25.5	27.0	28.0	28.5	30.5	0.65
10.	Back neck point to bust point	21.0	22.5	23.0	24.0	25.5	26.5	28.5	0.75
11.	Back neck point to waist:	30.0	31.5	32.0	33.5	35.0	35.5	38.5	0.71
12.	Side neck point to bust point	14.5	15.0	15.5	16.5	17.5	18.0	20.0	0.75
13.	Side neck point to waist:	23.5	24.0	24.5	26.0	27.0	28.0	30.0	0.68
14.	Side waist to hip	16.5	17.0	18.5	19.0	20.0	20.0	22.0	0.58
15.	Outside leg length	74.5	78.0	83.5	87.5	92.0	95.0	101.	0.74
16.	Inside leg length	54.0	56.5	60.5	64.0	67.5	69.5	74.0	0.66
17.	Total crotch length	57.5	58.0	61.5	63.5	66.0	68.5	71.5	0.71
18.	Straight body rise	21.0	21.5	23.0	23.5	25.0	26.0	27.0	0.64
19.	Neck base circumference	26.0	27.5	28.0	29.5	30.0	30.5	31.5	0.69
20.	Bust circumference	56.0	58.0	60.0	63.5	66.5	68.5	74.0	0.78*
21.	Waist circumference	52.0	53.5	55.0	57.5	59.5	60.0	63.0	0.71
22.	Hip circumference	60.5	63.0	66.0	70.5	74.0	75.5	81.0	0.78*
23.	Thigh circumference	35.5	37.5	39.5	43.0	45.0	46.0	49.0	0.73
24.	Knee circumference	26.5	27.0	28.5	30.5	32.5	32.5	34.5	0.74
25.	Calf circumference	24.5	24.5	25.5	27.5	28.5	29.5	30.5	0.75
26.	Ankle circumference	16.5	17.0	18.0	19.0	19.5	20.0	20.5	0.71
27.	Upper arm circumference	18.5	18.5	20.0	21.0	22.0	22.5	23.5	0.68
28.	Wrist circumference	13.0	12.5	13.0	13.5	14.0	14.5	15.0	0.73
29.	Across Front width	22.5	22.5	24.0	24.5	26.0	26.0	27.5	0.68
30.	Nipple to nipple	13.0	13.0	13.5	14.0	14.5	15.0	16.0	0.67

Table 1 continues

31.	Across back width	24.5	25.0	26.0	27.0	28.0	28.5	30.5	0.68
32.	Across back shoulder width	26.5	26.5	28.0	29.0	30.0	30.5	32.0	0.68
33	Shoulder length	9.0	9.5	10.0	10.0	10.5	10.5	11.0	0.55

*All measurements are in cm except weight which is in kg; n = 707; Correlation: *Strong = $0.76 < r < 1$; Mild = $0.5 < r < 0.76$; Weak = $r < 0.5$ (Source: Field Data)*

Table 1 presents the mean measurements for all dimensions, as well as the correlation coefficient values of each dimension. Weight, height, bust circumference, and hip circumference, demonstrated strong correlation coefficients ($0.76 < r < 1$) and strong associations with most dimensions in this study. The 28 other dimensions showed

mild correlation and none had weak correlation. Weight is not directly used in garment production and was substituted with waist circumference, which exhibited strong correlations with weight and nine other dimensions, despite having a mild correlation of $0.71 < r < 1$. Therefore, height, bust, hip and waist were observed as key dimensions in this study.

Table 2a: Size Intervals of Key Dimensions of Ghanaian Pre-Teen Girls

Dimen sions	6 yrs.		7 yrs.		8 yrs.		9 yrs.		10 yrs.		11 yrs.		12 yrs.		ASI (Approx.)
	MM	SI	MM	SI	MM	SI	MM	SI	MM	SI	MM	SI	MM	SI	
Height	116.	5.5	121.5	6.0	127.	6.0	133.	5.5	139.	4.0	143.0	7.0	150.		5.7
Bust	56.0	2.0	58.0	2.0	60.0	3.5	63.5	3.0	66.5	2.0	68.5	5.5	74.0		3.2
Waist	52.0	1.5	53.5	2.0	55.0	2.5	57.5	2.5	59.5	0.5	60.0	2.5	63.0		1.9
Hip	60.5	2.5	63.0	3.0	66.0	4.5	70.5	3.5	74.0	1.5	75.5	5.5	81.0		3.4

All values are in cm; yrs. = years; MM = Mean Measurements; SI = Size intervals; ASI = Average Size Interval

Table 2a summarizes the width between sizes also known as size intervals (SI), and average size intervals (ASI) of key dimensions for the seven (7) age groups. These ASIs were: height - 5.7 cm, bust - 3.2

cm, waist - 1.9 cm, and hip - 3.4 cm. The ASI's, approximated to the nearest 0.5 cm; 6.0, 3.0, 2.0 and 3.5 respectively (as shown in brackets) become the final (new) size intervals.

Table 2b: Normalized Measurements using Final Size Intervals

Dimensions	6 yrs.	7 yrs.	8 yrs.	9 yrs.	10 yrs.	11 yrs.	12 yrs.	Size Intervals
Height	116.0	122.0	128.0	134.0	140.0	146.0	152.0	6.0
Bust	56.0	59.0	62.0	65.0	68.0	71.0	74.0	3.0
Waist	52.0	54.0	56.0	58.0	60.0	62.0	64.0	2.0
Hip	60.5	64.0	67.5	71.0	74.5	78.0	81.5	3.5

All values are in cm; yrs. = years

Table 2b shows the results of normalization using the final size intervals, in order to establish consistent

and coherent size intervals across the measurements. For example, the initial values for bust were: 56.0 cm, 58.0 cm, 60.0

cm, 63.5 cm, 66.5 cm, 68.5 cm, and 74.0 cm for ages 6, 7, 8, 9, 10, 11, and 12 years respectively (table 2a). Following the successive application of the new size interval of 3.0 cm, the values became 56.0 cm, 59.0 cm, 62.0 cm, 65.0 cm, 68.0 cm, 71.0

cm, and 74.0 cm. Notably, the bust measurement for the first size group (6 yrs.) remained 56.0 cm, with minor adjustments to the original mean measurements for the other age groups.

Table 3: Size Chart of Ghanaian Pre-teen Girls

		6 yrs. 113- HR	7 yrs. 119- 124.9	8 yrs. 125- 130.9	9 yrs. 131- 136.9	10 yrs. 137- 142.9	11 yrs. 143- 148.9	12 yrs. 149- 154.9
Size Variations	Dimensions	Measurements						
S	Height	113.0	119.0	125.0	131.0	137.0	143.0	149.0
	Bust	54.50	57.50	60.50	63.50	66.50	69.50	72.50
	Waist	51.00	53.00	61.00	64.00	67.00	70.00	73.00
	Hip	58.75	62.25	65.70	69.25	72.75	76.25	79.75
M	Height	116.0	122.0	128.0	134.0	140.0	146.0	152.0
	Bust	56.00	59.00	62.00	65.00	68.00	71.00	74.00
	Waist	52.00	54.00	56.00	58.00	60.00	62.00	64.00
	Hip	60.50	64.00	67.50	71.00	74.50	78.00	81.50
L	Height	118.9	124.9	130.9	136.9	142.9	148.9	154.9
	Bust	57.50	60.50	63.50	66.50	69.50	72.50	75.50
	Waist	52.99	54.9	56.99	58.99	60.99	62.99	64.99
	Hip	62.25	65.75	69.25	72.75	76.25	79.75	83.25

All values are in cm; yrs. = years; HR = Height Range; S = Small; M = Medium; L = Large

Table 3 presents a size chart of Ghanaian pre-teen girls, showing the size designation system as well as measurements of key dimensions. The size code is based on age and height ranges, with three size variations; small (S), medium (M) and large (L). The size variations are based on lower limit, midpoint, and upper limit values, which correspond to the S, M and L measurements respectively, to accommodate the rapid growth typical of pre-teen children. For the height range of each size, 0.01 was subtracted from the upper limit value, to prevent it from overlapping with the lower limit value of the next size. For example, the upper limit value of 6-year group is 119.0, while the

lower limit value for the 7-year group is also 119.0. The subtraction of 0.01 from the upper limit value of the 6-year group makes it 118.9, and differentiates it from the lower limit value (119.0) of the 7 year group.

Discussion

The purpose of this study was to develop a standard sizing system for garments based on anthropometric statistics of 6 to 12-year-old Ghanaian girls. The key dimensions; height, bust, waist, and hips, as observed in other studies, are recognized as fundamental dimensions in determining sizes for girls' garments (Sowah, 2020) and segmenting the population into size categories (Hrženjak

et al., 2013). The bust and length areas of girls' garments, often present fit challenges due to the rapid pre-pubertal growth in pre-teen girls. Weight, which is not used directly in garment production was substituted with waist, a related and strongly correlated dimension (Huyssteen, 2006; Zakaria, 2016). Waist is a significant dimension, traditionally considered key in the manufacture of female clothing, alongside bust and hips (Hrženjak et al., 2013). Furthermore, many consumers possess a good understanding of their waist measurements, and can consequently select clothing based on this criterion. Thus, for the development of a size chart for Ghanaian girls, height, bust, waist and hips were selected as key dimensions. The remaining dimensions were classified as secondary dimensions, valuable alongside the key dimensions for garment manufacture.

While height exhibited a strong correlation with 14 other dimensions, age correlated strongly with only three dimensions. Therefore, height emerged as a more reliable predictor of size compared to age. Moreover, it was observed that at the same age, the girls had varying height measurements, and vice versa. For instance, among the 12-year-olds, height measurements ranged from 125 cm to 165 cm, indicating a substantially wide height variance of up to 40 cm. A similar trend of height variance was apparent in the six other age groups. These findings indicate that, age variations among the Ghanaian pre-teen girls studied did not correspond directly to changes in height, therefore age alone cannot be relied upon to predict the girls' sizes. The disparities in height measurements among girls of similar ages align with findings from similar studies

(Tongue et al., 2010; Hrženjak et al., 2013; Widianti, 2017; Zakaria, 2020). Consequently, these findings underscore the limitations of using age as a standalone parameter. Therefore, combining age with other factors, such as height, is essential for determining sizes for children's clothing (Huyssteen, 2006; Hrženjak et al., 2013).

The intervals between the mean measurements across the different ages exhibited inconsistencies, highlighting the need for uniformity, as advocated by ISO 8559 (2018). To achieve this consistency, average size intervals (ASIs) for the key dimensions were calculated, and for practicality and precision, the ASIs were approximated to the nearest 0.5 cm. The size intervals; height - 6, Bust - 3, waist - 2.0, hip - 3.5, although unique to Ghanaian pre-teen girls, align with intervals suggested by other researchers and sizing standards (Shoben and Taylor, 2004; Aldrich, 2012). For instance, the ASI for height approximated to 6.0 cm, corresponds to the average annual increment in height measurements among children (Aldrich, 2012). The normalization of size intervals for consistency results in standardization and enhances the practicality and comparability of data, ultimately facilitating the creation and use of a comprehensive size charts. This process of determining size intervals typically results in insignificant alterations to a few of the original measurements, in line with previous studies (Huyssteen, 2006; ISO 8559, 2018).

Size designation was based largely on height ranges of the size groups, as height was identified as a reliable predictor of children's body size compared to age. However, age was incorporated into the

size code, given its widespread use as a medium of size communication (Aldrich 2012; Tongue et al., 2010). Additionally, Tongue et al. (2010) emphasized that age should not be entirely disregarded in size designation for children, as it is user-friendly and provides a basis for selecting correct sizes. For many consumers, age is the only known factor when choosing children's garments. Therefore, size designation was created using age and height as the size code for Ghanaian pre-teen girls. This approach ensures both practicality and accessibility for consumers seeking the right fit for their children.

While the size code gives an idea of the child's age and height, the measurements of key dimensions can serve as supplementary information for labelling and selection of sizes, contingent on the specific type of garment. For example, when labeling girls' skirts, size labels could include waist and hip measurements, whereas dresses might incorporate bust, waist, and hip measurements. This approach aligns with findings highlighting customer confusion and dissatisfaction during clothing size selection, due to the absence of information regarding key body measurements (Sowah, 2020). Three size variations (S, M, and L) introduced within each age group is in line with the need for inclusion of more sizes and size variations for pre-teen children to cater to their swift growth (Aldrich, 2012; Hrženjak et al., 2013; Bizuneh et al., 2025). Additionally, the S, M and L size groups caters for the varied height measurements found among girls of similar ages in this study. It ensures that the sizing system is not only comprehensive but also adaptable to the

diverse growth patterns among pre-teen girls, offering consumers a wider range of choices to find the best fit for their children.

Conclusion

The newly created size chart contributes to enhancing the fit of girl's garments. Based on the findings of this study, key dimensions critical to shaping and implementing sizing systems for Ghanaian pre-teen girls are height, bust, waist, and hip. The size intervals identified were also unique to Ghanaian pre-teen girls. In terms of size prediction and designation, height emerged as the most suitable, whereas age is an unreliable measure but used only as a means of identifying sizes. Furthermore, children's measurements are widely varied within size groups due to the rapid growth characteristics.

Recommendations

1. Key stakeholders like the Ghana Standards Authority, relevant academic institutions, garment manufacturers' associations, trader's associations, as well as consumers of girls' garments, should collaborate to validate the size chart by using it for production of garments and evaluating the fit of garments produced.
2. Age should be used in conjunction with height or other key dimensions, and not as a standalone parameter, when determining or selecting sizes for children.
3. Sizing systems for pre-teens should include a greater number of size categories and size variations to accommodate their rapid growth rates effectively.

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