RESEARCH REPORT

Age Expansion of the Thirty-Second Walk Test Norms for Children

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Purpose: The purposes of this study were to expand age ranges for a previously published normative database (n = 227) on the 30-second walk test, describe changes with age, explore contributions of subject characteristics, and verify previous data. Methods: Children (n = 302; age, 5–17 years) from 4 urban schools were tested for distance walked in 30 seconds. Age, height, right lower extremity length, weight, sex, and race/ethnicity were recorded. Results: Distance walked increased from 5 to 10 years of age, decreased slightly at age 11 years, followed by a more gradual decrease from 12 to 17 years. A significant difference in distance walked was found across ages. Right leg length, age, and weight explained 11.5% of the variance in walk distance. Conclusion: A percentile chart of the pooled data (previous and current, n = 529) should facilitate the use of the 30-second walk test when examining children for mobility limitations. (Pediatr Phys Ther 2009;21:235–244)

Key words: adolescents, analysis of variance, biomechanics/statistics and numerical values, child, cross-sectional studies, exercise test/methods, female, gait, human movement system, male, reference values

INTRODUCTION AND PURPOSE

Focus on functional outcomes and objective documentation has become foundational to physical therapy practice. In the school setting, this is especially true as services are directed to supporting a child’s educational plan. The publication of the second edition of the Guide to Physical Therapist Practice supports this focus with its emphasis on systematic data gathering and a patient management process that includes objective and functional outcome measurement. Objectivity often involves the use of standardized tests and, increasingly, knowledge of a client’s performance in his/her natural environment.

For walking performance in children, gait laboratories have been used when precise knowledge of joint motions, torques, and forces is needed, such as in presurgical assessment. Within a clinic, where sophisticated measures may not be available, walking performance has been examined more as a facet of multidimensional standardized tests of motor skills or functional performance (eg, Bruininks-Oseretsky,2 Peabody Developmental Motor Scale,3 and the Gross Motor Function Measure4). As such, these tests may address ability to walk, fitness, coordination, or the ability to hop on 1 foot. Several single-dimension tests originally developed for adults are described in Part III of the Interactive Guide to Physical Therapist Practice5 and include the Timed Up and Go and the 6-minute walk test (6MWT). The Timed Up and Go, which involves rising from a chair and walking a short 3-m distance, has been examined in children,6,7 but its focus on safety, balance, and fall risk limits its use for describing comfortable walking distance or speed. The 6MWT has also been examined in children.8–11 This test looks more at functional exercise capacity or endurance and as such may not be applicable when describing comfortable walking speed or when physical disability restricts the time or distance that a person can walk.

As an alternative to balance or endurance focus, a walking test based on knowledge of casual or comfortable walking speeds for children could help physical therapists judge a child’s ability to traverse a given distance in a limited time. In school settings, children are often expected to get to the lunch room or between classrooms in a short...
period of time. Keeping up with peers is a consideration, and, hence, knowledge of norms can allow comparison and objective documentation of a mobility limitation. In 1999, Knutson et al.\textsuperscript{12} published a report describing a single-dimension walking test for children, designed for such purposes. The 30-second walk test\textsuperscript{12} (30sWT) was unique in its description of norms for comfortable or self-selected walking in a natural school-based environment. The test took a short time to administer and did not require extensive equipment or a gait laboratory. In addition, the database was complemented by a growth curve presentation that made interpretation of age-related performance quick and easy. Such growth curve formats have been used for other physical function measures by Piper and Darrah\textsuperscript{13} and Haley et al.\textsuperscript{14}

The 30sWT\textsuperscript{12} involves measuring the number of feet walked in a specified period of time as the direct outcome measure. This unit of measurement is desirable in US school settings where floor tiles frequently measure 1 square foot. Simple calculations allow data to be converted from feet to meters or to walking velocity (WV) for comparison with other research reports. The 227 children who formed the standardization group were 6 to 13 years old.\textsuperscript{12} Age profiles for distance walked and WV in a natural environment were clarified for the ages of 6 to 13 years; however, because of limited numbers of children of the youngest and oldest ages, caution was advised for using the test norms for 6- and 13-year-old children.\textsuperscript{12} Velocity increased from 6 to 8 years, plateaued from 8 to 11 years, decreased at 12 years, and appeared to increase again at 13 years.

Comparison of WV from the 30sWT with that reported in other literature suggested that children walk more slowly in laboratory settings than in the natural environment of the school.\textsuperscript{12} Temporal-distance data published from 1971 to 1993\textsuperscript{15–22} on children 10 months to 14 years of age, often reported as means for combined age groups, collectively showed that WV increased with age in children who are healthy. A summary of studies on WV in children was reported previously.\textsuperscript{12} More recently, use of the GaIT-Rite (CIR Systems, Inc, Havertown, PA), a portable 7.66-m mat with a central, more restrictive sampling zone (3.66-m mat), also resulted in slower WV\textsuperscript{23} compared with that in the study of Knutson et al.\textsuperscript{12} Testing conducted in confined spaces or over a limited walking zone may explain why WV was slower in these studies compared with that described by Knutson et al in a natural environment. In all studies, WV increased with age in children who are healthy. Such an increase has been attributed to increasing height and leg length, given that cadence actually decreases with age.\textsuperscript{19} Knutson et al\textsuperscript{12} reported, however, that only 14.4% of the variance in distance walked on the 30sWT was explained by leg length and weight and suggested that other factors such as personality and temperament might explain the large remaining variance.

Expansion of the 30sWT to include a broader age range was important as a basis for subsequent appraisal of children between the ages of 5 and 16 years with suspected or known mobility limitations. The purpose of this study was to expand or broaden the age range of the normal database previously published for the 30sWT.\textsuperscript{12} Secondary purposes were to examine the differences in distance walked in 30 seconds for children from ages 5 to 16 years, explore the contribution of selected variables to the distance walked, and verify previous data. These data facilitate effective physical therapist practice by providing a simple, objective indicator of client performance. When tracked, the data may be used to reflect maturational change with time or as an outcome measure for the effects of intervention.

**METHODS**

**Subjects**

Student volunteers were recruited from 2 public elementary schools, a public high school, and a K–12 university-based laboratory school in the midwestern United States. Participating secondary school students were dressed for physical education classes. The elementary students wore their school clothing during testing, which was conducted during physical education class.

Permission to conduct this study was approved by the University's Human Subjects Institutional Review Board. In addition, permission was also granted from the local school district's instructional review personnel. Parents of students at the university-based laboratory school annually sign a blanket consent form for students to participate in institutional review board–approved university research. Consent for public school students was obtained by return of a signed parental permission/consent form. All students involved in the study signed a child assent form.

Participants included 147 boys and 155 girls from kindergarten through grade 9 (age range, 5–17 years). This sample size was deemed appropriate, given the study's descriptive nature. Participants represented 5 ethnicities: white (n = 290), African American (n = 5), Hispanic (n = 2), Asian American (n = 4), and Indian-Pakistani (n = 1). Table 1 contains the anthropometric data and numbers of students at each age. Students were asked their date of birth, and the age classification of all participants was assigned by the age of the child on the testing date. If there was any question about the birth year, official school records were consulted.

A total of 348 subjects completed the walking test. Of these children, 46 were excluded because of the following reasons: (1) inappropriate footwear (eg, flip flops, heeled shoes, no shoes); (2) injury of lower extremity affecting mobility (eg, foot cast, ankle sprain); (3) physical condition affecting mobility (eg, apparent neurological disorder); and (4) student attitude affecting normal gait (eg, a deliberate slow walk, walking with hands in pockets, or being competitive to be the fastest walker). Sample sizes of 25 to 50 for each age group were adequate to detect a moderate (0.5) to large (0.7) effect size in the primary variable, distance walked in 30 seconds, between age groups with 80% power; effect size calculations were based on the difference between mean group distances divided by the standard deviation.
Instrumentation

Data collection tools included a fiberglass tape measure to measure leg length, an upright scale to measure body weight, a stadiometer to measure height, and a digital stopwatch to clock the 30-second test. A 200-ft measuring tape was used to mark incremental distances on the oval walking course created on the gymnasium or multipurpose room floor where physical education classes were held. Orange cones and tape were used to mark the corners of the walking course. The distances walked were measured using the marked increments on the floor and a 10-ft measuring tape.

Procedures

Data were collected during physical education classes in the school gymnasium or multipurpose room. Researchers performed the same duties at each school during the data collection. The same instructions were given to the children at each test occasion. Other than the upright scales with stadiometers, all pieces of equipment used for data collection were the same. At each school, the upright scale was calibrated using weight plates. All measures were taken in English units consistent with typical clinical practice in the United States. Values are reported in metric units with English units in parentheses.

At each site, before data collection, 2 of the researchers marked the floor of the gymnasium or multipurpose room perimeters in 10-ft increments beginning at 80 ft. The walking course in the multipurpose rooms at the public elementary schools measured 45 × 35 ft. The gymnasium at the university laboratory school measured 94 × 50 ft. The raised walkway above the gymnasium at the public high school measured 113 × 106 ft. At each school, the 90° corners were taped in a curve and marked with orange cones to create an oval-shape walking course.

Class time for junior high and high school physical education was 50 minutes, whereas elementary physical education class time was 30 minutes. When participating
students entered the room, they sat on the floor while the investigator explained the purpose of the study and read the assent form. Students were asked to sign the assent form if they were willing to participate. Each participant was then given an identification number (a sticker placed on his/her chest), and the number was noted on the collected assent form. Three stations for data collection were explained and demonstrated: (1) leg measurement, (2) height and weight, and (3) 30sWT. Students were divided into 3 groups and rotated through the stations.

Height was measured to the closest 1/4 in, and weight was measured to the closest 1/4 lb while each participant stood in socks on the platform of the scale with his/her back to the scale. The length of each subject’s right leg was measured with the subject lying in the supine position on a soft mat with hips in neutral rotation and knees extended. Malleoli were initially positioned touching, then separated sufficiently to ease placement of the fiberglass tape measure from the palpated anterior superior iliac spine to the distal margin of the medial malleolus while ensuring that neither leg was adducted beyond the body’s midline. Leg length measurements were rounded to the nearest 1/4 in.

At the 30-second walk station, a researcher read the standardized instructions for the 30sWT. To provide developmentally appropriate wording, elementary students were instructed to walk as if they were the “line leader,” whereas secondary students were instructed to walk at a “natural and comfortable pace.” All students walked in a counterclockwise direction around the marked walking course. The researcher who started the students walking also verbally signaled the students to stop at the end of 30 seconds. Two other researchers noted each student’s gait pattern, identified the student’s forwardmost foot placement on the walking course when “stop” was called, and measured the distance to the nearest inch. The student’s forwardmost foot placement was determined by the most advanced part of the foot in contact with the floor. For example, if heel strike was complete, the distance was measured to the heel, whereas if the participant was in midswing, the distance was measured to the toe of the back foot. Differences in judgment of the forwardmost foot placement were reached through a brief discussion between the 2 researchers responsible for measuring distance. Disagreement occurred <10% of the time and involved 1 step or less.

Reliability of the 30sWT was confirmed in a separate group of 12 children (11–14 years; 5 girls, 7 boys). Each child completed two 30sWTs in a gymnasium that measured 94 × 50 ft. Two separate starting points were used to reduce the children’s temptation to “compete” with previous tests. Starting points were alternated by child, and both tests occurred within 15 minutes. Tests were highly correlated (Pearson r = 0.965) with no significant difference between the 2 tests (test 1, 48.5 ± 9.1 m; test 2, 49.3 ± 9.0 m; t = -1.16, p = 0.27). Because no gold standard measure for assessment of walking ability in children has been established, examination of the concurrent validity of the measure was not possible. Validity of the 30sWT is addressed under the concept of logical validity supported by the observation that walking distance in a 30-second period of time as implemented does allow for simple assessment of walking ability in a natural environment.

Data Analysis

Data were entered on an Excel spreadsheet and imported to SPSS 11.0.1 (Chicago, IL) for data analysis. Descriptive statistics were calculated for all variables for each age group. One-way analysis of variance (ANOVA) and Student-Newman-Keuls follow-up tests were used to evaluate the differences in walking distances across the ages of students in this study. Test results are reported in distance walked (meters and feet); however, velocity (distance walked per second) was also calculated and reported. Pearson product moment correlations and stepwise multiple linear regression (MLR) were used to study the association of variables. Verification of previous 30sWT study12 data with present data was managed descriptively.

RESULTS

Subject characteristics, distance walked, and WV are shown in Tables 1 and 2 by age group for the 302 students. Data for girls and boys are presented separately and in combination. The distance walked for boys and girls in each age group is reported in Table 2 and plotted in Figure 1. Because of the small number of subjects at age 17 (n = 5) and the absence of a significant difference between 16- and 17-year-old children (t = 0.274; p = 0.79), these 2 age groups were merged for the ANOVA (Table 2).

One-way ANOVA revealed a significant difference in the distance walked with age (F = 6.299, p < 0.001). Absolute differences in mean distances between age groups are shown in Table 3 with significant differences denoted by asterisks.

MLR revealed significance for a 3-variable model (F = 12.87, p = 0.001) in which subject characteristics of leg length (centimeters), age, and weight (kilograms) offered a significant contribution to explain the distance walked in 30 seconds; height, sex, and body mass index (BMI; kilograms of body mass divided by height in meters squared) were excluded from the model (partial correlations of 0.040, −0.076, and 0.072, respectively). The multiple correlation (r = 0.339) for the 3 contributing variables corresponded to an R² value of 0.115, indicating 11.5% of the variance in distance walked could be explained by right leg length (p = 0.001), age (p = 0.001), and weight (p = 0.002). Pairwise correlations of distance walked was significant for leg length (r = 0.170, p = 0.002) and height (r = 0.139; p = 0.008).

Table 4 shows data from this study, the 1999 30sWT study,12 and the pooled data from both studies. Figure 2 shows the mean values from this study compared with those from the previous publication of the 30sWT. Figure 3 presents a percentile chart based on pooled data for distance walked in feet (left y axis) and meters (right y axis) from the 5th to 95th percentiles from ages 5 to 16 and 17 years (combined).

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for the distance walked in 30 seconds because the previous significant difference between the few 17-year-old subjects
in both boys and girls (Fig. 1).

DISCUSSION

This study expands the normal database for the 30sWT to include ages 5 to 17 years. Because there was no significant difference between the few 17-year-old subjects and the 16-year-old subjects, these 2 groups were merged into a 16- to 17-year-old group. Data were collected in feet for the distance walked in 30 seconds because the previous study and US school systems most often use this measurement standard. For universal applications, data are also presented in meters.

Children between 7 and 14 years of age walked faster than did the children at the ends of the age spectrum. There was no significant difference between 5- and 6-year-old children and neither the 5- or 6-year-old group differed from children older than 15 years; both the youngest and oldest children walked significantly slower than children in the middle age range (7–14 years; Table 3). Although walking less distance is expected for young children due to shorter leg length and height, other explanations for relatively slow walking must be considered for the older children. Attitude and behavioral state may be factors. The decrease in mean distance for the older children occurred in the middle age range (7–14 years; Table 3). Although walking less distance is expected for young children due to shorter leg length and height, other explanations for relatively slow walking must be considered for the older children. Attitude and behavioral state may be factors.

The distances walked by children aged 6 to 12 years in this study were not appreciably different from that published in 1999 for comparable ages (Fig. 2). In that study,
the distance walked in 30 seconds increased with age but was not continuous, showing an increase from 6 to 8 years, a plateau from 8 to 11 years, followed by a decrease at 12 years and an increase at 13 years. Data from the current study (Tables 2 and 3, Fig. 2) also showed a decrease (non-significant); however, this occurred a year earlier, at age 11 years, and was followed by a downward trend for ages 12 through age 16/17 years. The results of this study confirm previous results12 for ages 6 to 12 years and suggest that the previous results for the age of 13 years may have been spurious because of having only 5 subjects (Fig. 2, Table 4).

Similar to the previous study12 that introduced the 30sWT, children in this study walked faster in the natural setting (e.g., school environment) than did children studied in gait laboratories. Six- and 7-year-old children studied by Sutherland et al19 walked 1.12 and 1.14 m/s in a gait laboratory, whereas children of the same age studied by Knutson et al12 walked 1.35 and 1.44 m/s in a school gymnasium, and 1.43 and 1.55 m/s in this study. O¨ berg et al22 reported a group WV mean of 1.10 m/s for girls and 1.32 m/s for boys aged 10 to 14 years studied in a gait laboratory. By contrast, mean velocities in this study were higher at all ages for girls and boys of a similar age (10–13 years; range, 1.58–1.67 m/s, based on Table 2 data). Foley et al16 studied children in the 6- to 13–year-old age range and found a mean WV of 1.04 m/s, also slower than the lowest mean velocity for all subjects in this study (Table 2). When using the GAITRite, Dusing and Thorpe23 reported that 10-year-old children walked at a non-normalized velocity of 1.30 m/s that is also slower than 10-year-old children walked (velocity 1.67 m/s) in this study. Instrumentation and environmental constraints may explain slower WV in a motion analysis laboratory or over a short constrained distance. Examination of the effect of environment on WV is a potential area for future research.

**TABLE 3**

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<th>9; 50.5</th>
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* Significant at $p < 0.05$.

**TABLE 4**

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* Determined by a weighted averaging of the 2 data sets.

Fig. 2. Mean values for walking velocity from this study compared with those of the previous publication of the 30sWT.12
Other longer walking tests (eg, 6MWT) have the potential to be influenced by endurance and fatigue. When natural WV is the focus, the obvious appeal of the 30sWT is the shorter timeframe and the avoidance of fatigue, especially important if used for some children with disability. Use of longer time/distance tests may be appropriate for other purposes (eg, assessment of functional exercise capacity and distance walking performance).

Natural setting alone will not ensure a faster WV. When observing children walking as line leaders in elementary school hallways during the school day, David and Sullivan\textsuperscript{24} reported velocities ranging from 3.7 to 4.7 ft/s (1.13–1.43 m/s) for students in kindergarten through sixth grade. In our study, students in the same approximate age range (assuming children aged 5–12 years would be included in grades kindergarten through 6) walked faster, from 4.5 to 5.5 ft/s (1.37–1.67 m/s). A likely reason for this difference is the level of student control over the walking pace. Students in our study self-selected the WV as they individually completed the 30sWT. No one walked in front of the child or attempted to control the child’s WV through verbal cues once walking commenced. This is in contrast to the study of David and Sullivan\textsuperscript{24} in which the teacher walked at the front of the line with the students or gave verbal prompts in nearly half of the recorded cases, thus seeming to create a teacher-guided pace.

The children in our study seemed to walk faster than adults. Using data tabulated by Craik and Dutterer,\textsuperscript{25} and excluding data associated with a speed command (eg, slow or fast speed), adults 19–62 years old had an average WV of 1.29 m/s. This value is closest to that for our 5-year-old age group who walked 1.37 m/s and our 16/17-year-old age group who walked 1.40 m/s. Test conditions used to secure the adult data likely vary from those used in our study and limit direct comparisons.

To address the contribution of selected variables to the distance walked, a stepwise MLR was run with right leg length (centimeters), age, weight (kilograms), sex, height (centimeters), and BMI variables forming the model to predict distance walked. Height was not significant and likely was excluded from statistical contribution due to collinearity with leg length, as described previously.\textsuperscript{12} Somewhat surprisingly, right leg length and body weight independently provided greater contribution to the model than did BMI. Exclusion of sex from the model was consistent with the absence of a statistically significant difference in the 30sWT between boys and girls. The R value of 0.339 (R\textsuperscript{2} = 0.115) for significant variables (leg length, age, and weight) was slightly less than r = 0.379 (R\textsuperscript{2} = 0.14) reported previously\textsuperscript{12} for significant variables (leg length and weight). Variables that were not significant in the previous study\textsuperscript{12} were age and sex. Inclusion of a broader age range of children may explain the additional contribution of age to the model in this study. If only 11.5% of the distance walked by children who are healthy can be explained by leg length, age, and weight, then other factors such as personality, attitude, or environment may help to account for the unexplained variance. Analysis of the influence of personality, attitude, and environment was beyond the scope of this study but is a potential area for future research.

Expansion of the age range and number of subjects strengthens the previously published 30sWT test. Figure 3 is a normative group percentile chart of the 30sWT based on data pooled from the current and previous work.\textsuperscript{12} To

![Fig. 3. The 30sWT percentile chart. For clinical use, enter the chart according to the child’s age, then move vertically to find the corresponding feet (left y axis) or meters (right y axis) that the child walked in 30 seconds. Enter a mark to indicate the child’s performance compared with age-matched, able-bodied peers.](image-url)
use the chart, the clinician marks the chart (Fig. 3) according to the child’s age and distance walked. The child’s percentile of performance can be estimated at the point of intersection.

The 30sWT can be used for discriminative applications. Discriminative tests identify the current performance of individuals on a particular dimension, in this case percentiles of walking ability. The test might also be used by a physical educator to screen children in a school setting for referral to a physical therapist. For example, if a child’s performance falls below the 5th percentile on the chart shown in Figure 3, examination by a physical therapist may be indicated to determine the basis for the mobility limitation and whether intervention is needed. Not all children with disabilities will show deficits in mobility. Whereas children with moderate cerebral palsy (eg, level III Gross Motor Function Classification System,27) are likely to fall below the 5th percentile, some children with mild cerebral palsy (eg, levels I or II Gross Motor Function Classification System27) or children with mild motor dysfunction may show results in the normal range. When used to monitor natural history, progress, or outcomes of intervention for children with disabilities, the test would be used serially and change in the percentile of performance appraised. Monitoring outcomes is an important step in the patient management process of clinical practice.1,3 The test can also be used as a normal reference in clinical research, such as is currently being done to examine effects of a bicycle training programming for children with cerebral palsy (Pediatric Endurance Development and Leg Strengthening, 1 of 4 Foundation for Physical Therapy clinical research network projects).

A population of convenience was studied. Students lived in southwest Missouri where diversity is limited. Only 12 (4%) of the 302 students were not white. Validation with other ethnic groups would be desirable.

This study included children from a number of grades but only 4 schools. The overall findings of this study are consistent with those of a previous report4 suggesting that the large number of children who came from 1 school and performance of children at a private school did not bias the results.

Variation in the walking instructions for elementary and secondary school students may have influenced study outcome. Instructions were designed to achieve natural and developmentally appropriate conditions. Younger children were instructed to walk like a line leader, to walk, not run, and to walk like they normally did. Line leader language has meaning in US elementary schools where children walk in a line between classrooms. Older children do not walk in line formation, and, hence, they were instructed to walk at a natural and comfortable pace.

Peers were present during testing, and this may have affected performance. Given the desire to make the test setting a natural environment, the benefit of an active setting might be considered preferable to a tightly controlled test condition without other students present. Having students walk one at a time helped to avoid the influence of peers or teachers.

As reported previously, parameters other than those studied may explain the distance that students walk in 30 seconds. Studies directed at understanding unexplained variance in distance walked may be of interest. Future study might determine whether the results apply to children from diverse ethnicities. Studies aimed at creating similar percentile charts for children with various disabilities may be of value for outcome monitoring within that specific diagnostic group.

In conclusion, this study expanded the age range for the 30sWT. The caution previously suggested3 for using the test with children aged 6–13 years has been eliminated with the expansion of data in this study to include children of ages 5 to 16/17 years. Distance walked varied significantly across the ages studied. MLR suggested that leg length, weight, and age explain the most about the distance that the students walked in 30 seconds. Data from the current study were pooled with previous 30sWT data12 to create a new percentile chart. The 30sWT can be used by physical therapists and physical educators to assist in identifying children who may benefit from physical therapy services. The WV calculated by converting the distance data from the 30sWT may be preferable to laboratory-based reports of WV when making decisions about students’ performance at school.

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REFERENCES


CLINICAL BOTTOM LINE

The 30-Second Walk Test (30sWT) Norms for Children

“How should I apply this information?”
Currently, pediatric physical therapy practice has a focus on functional outcomes and its objective documentation. Objectivity often means the use of standardized tests mostly in a non-natural environment, such as a laboratory and practice environment. Sophisticated measurements have been used in gait laboratories to document walking performance in children. Outside these facilities, walking performance has been assessed as a part of multidimensional motor skills or functional performance test or as a single-dimension test such as the 6-minute walk test. Although these latter tests examine the ability to walk, such as coordination or exercise capacity and endurance, therapists often want to know and judge a child's ability to walk a given distance in a given time. Especially in school settings, children often are expected to change classrooms in a short period of time. For objectively judging this performance, we need a test that takes a short time to administer while not requiring extensive equipment or a gait laboratory. To interpret the results, we need norms for comfortable, self-selected walking in a natural school-based environment, preferably presented as a growth curve that makes interpretation of age-related performance quick, easy, and reliable. These data effectively facilitate pediatric physical therapists' practice by providing an objective indicator of a child's performance, and when tracked, data may be used to reflect maturational change over time.

“What should I be mindful about in applying this information?”
The current study expands the normal database for the 30sWT in a natural environment to include ages 5–17 years. Age, weight, and (right) leg length seem to be important determinants that could influence the total walking distance. These determinants should, therefore, be measured in the clinical setting before starting the 30sWT to detect possible differences among children of the same age. Other factors such as personality, attitude, and environment may account for other detectable variances as well. These factors were beyond the scope of this study but should be taken into account when interpreting test results. However, research examining the effects of environment, personality, temperament, and attitude on walking performance is nonexistent.

Differences in ethnicity could influence the outcome values of the 30sWT; therefore, the reference values given in the current study are only applicable to the described ethnic group. Furthermore, the authors suggest administering the test to 1 child at a time; group testing would influence the individual test scores.

Physical therapists or other clinicians can use these normal data as a reference to assist in identifying those children who may benefit from pediatric physical therapy services. Then differences in walking distance as a result of physical therapy intervention can be recorded. However, all facets of development and maturation should be taken into account before the efficacy of such an intervention could be determined. This 30sWT can serve as a direct outcome measure and, when used serially, can be used to monitor changes in the percentile of performance, an important step in the objective documentation of our clinical practice.

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