

# Anthropometry of Algerian elderly

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**Abstract:** In Algeria, a lot of attention is given to the elderly by both the government and private institutions. On the government side, two ministries participate in caring for the elderly. These are the ministry of social development and the Ministry of public health. On the private side, a lot of effort is given to the elderly through many societies and centres. If the elderly is to live independently and self-efficiently, whether at home or in social care institutions, equipment, tools, environment, daily-use items, and personal-use items should be designed for them, so that their needs are entirely satisfied, and abilities and limitations are carefully considered. Therefore, this study was carried out to provide anthropometric data of the elderly in Algeria, so that it may be used either to design equipment for them or to evaluate it in order that its use is efficient, and safe. Therefore, An anthropometric study of Algerian elderly was carried out. 29 body dimensions were measured. Mean, variation measures, and percentiles, were calculated. Body dimensions results were presented in one table so that they can easily be used by designers.

Keyword: anthropometry, Elderly, Algeria

## 1. Introduction

One of the important principles of ergonomics is that workplace dimensions should match the body dimensions of the expected users. A good match can be obtained if anthropometric data are applied. Incorrect workplace design where anthropometric data are ignored can cause psychological discomfort, physical fatigue and could be harmful and damaging in the long term. Therefore, anthropometric data are an essential condition to the design of safe, comfortable and effective machines, tools and workplaces.

In developed countries, almost all sections of the population were anthropometrically measured, and anthropometric data are widely available. However, in developing countries, various sections of the population are not known with no anthropometric data.

Currently, Algeria has 3.5 million elderly people, representing 7.5% of the population.

In Algeria, despite the fact that some anthropometric data have been carried out [1], [2] and [3], other sections, especially children, military men, and elderly have not been anthropometrically studied.

This study aims, therefore, to provide anthropometric data which can be used in design or redesign of garment, equipment and hand tools.

## 2. Methods

**Subjects:** A sample of 60 male elderly who were chosen from the governorate (Wilaya) of Setif (Algeria). Their age ranged from 66 years to 81 years. They are mostly (88 %) retired workers who worked in different types of industrial and commercial work.

**Body dimensions:** 29 body dimensions were chosen because it has been thought that they are useful for the design or redesign of garment, equipment and hand tools. These measurements were: 10 in standing position (5heights, 1 breadth, 2 depths, handgrip force, and weight) and 19 in sitting position (8heights, 3 breadths, 5 lengths, and 3 hand measurements). Body dimensions, landmarks and the measurement of each body dimension procedures were defined after Frisancho [4].

**Equipment:** Body dimensions were taken with a Harpenden standard anthropometer (Holtain Ltd., UK). Hand measurements were taken using sliding calipers. A squeeze dynamometer (Model 78010 Lafayette Instrument Co.) was used to take the hand grip strength. In addition, a portable weighing scale accurate to +50 gms was used to take the body weight. Finally, an adjustable swivel stool which can rotate on a pivot attached to a 4-star welded steel base was used to take sitting dimensions.

**Procedures:** Both measuring postures were maintained throughout the whole survey as natural as possible according to Hertzberg [5]. To achieve a greater scientific uniformity, measurements were always carried out on the right-hand side of the subjects, to the nearest millimeter. In addition, all measurements were taken in mornings between 7 am and 12 am.

### 3. Results and discussion

All results are presented in Table 1 that shows the mean, standard deviation (SD), standard error of mean (SEM), coefficient of variation (CV), 1st percentile, 5th percentile, 50th percentile, 95th percentile, 99th percentile, the maximum and the minimum values. Besides, it shows the four anthropometric indices results.

Table (1)  
Anthropometric data of the elderly (n=60)

Measurement Mean	SD	CV %	Min	1st	5th	50th	95th	99th	Max
Age	68	11.1	16.3	66	10	18	36	54	81
Handgrip	28	8.7	31.0	19	28	31	36	41	49
Weight	64	10.9	17.0	50	52	59	64	72	85
<b>STANDING HEIGHTS</b>									
Stature	1716	76.0	4.0	1449	1549	1601	1726	1851	1909
Eye	1597	66.3	4.0	1168	1443	1488	1597	1706	1873
Shoulder	1443	67.1	4.7	893	1290	1335	1446	1556	1787
Elbow	1097	52.8	4.0	747	976	1012	1099	1185	1550
Knuckle	776	47.6	6.0	453	675	708	786	864	995
<b>STANDING BREADTHS</b>									
Chest	262	6.1	6.0	182	226	238	264	291	415
<b>STANDING DEPTHS</b>									
Chest	217	19.0	8.7	159	173	186	217	248	350
Waist	200	22.1	11.0	116	149	167	200	236	304
<b>SITTING HEIGHTS</b>									
Sitting	870	35.4	4.0	685	788	812	870	928	1069
Cervical	679	34.2	4.9	573	653	633	689	745	873
Eye	744	39.1	5.2	510	609	680	744	808	850
Shoulder	603	37.2	6.1	411	522	548	602	670	743
Knee	522	30.0	5.7	326	452	473	522	571	649
Popliteal	412	30.0	7.0	244	342	373	422	441	494
Elbow	191	24.0	12.5	105	135	152	191	230	335
Thigh Thickness	112	15.3	13.3	88	79	90	115	140	215
<b>SITTING LENGTHS</b>									
Buttock-Foot	1021	48.4	4.6	697	928	962	1041	1120	1163
Buttock-Knee	564	38.4	6.6	363	485	511	574	637	840
Buttock-Popliteal	475	28.5	6.0	314	409	428	475	520	620
Shoulder-Elbow	349	32.2	9.2	251	274	296	349	402	559
Elbow-Finger Tip	463	33.0	7.1	346	386	409	463	517	528
<b>SITTING BREADTHS</b>									
Shoulder	406	27.0	6.6	303	343	362	406	450	504
Elbow- Elbow	430	38.0	8.8	326	341	368	430	492	730
Hip	337	25.8	7.6	198	277	295	337	379	528
<b>HAND MEASUREMENT</b>									
Hand length	193	14.0	7.2	140	161	171	194	217	297
Hand breadth	99	8.4	8.3	90	87	90	101	115	150
Hand Breadth Metacarpa	82	4.0	4.8	88	73	75	82	89	101

NB: All measurements are in mm except handgrip and weight in kg.

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