A Systematic Review: Standard Measurement method of *Anguli pramana*

Review Article

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Abstract

Introduction: *Anguli pramana* is an ancient form of anthropometric measurements where individual's own finger width is used as a unit of measurement. Different researchers had attempted to standardize the *Anguli pramana*. This systematic review aims to review all the available published literature and to provide the narrative summary on *Anguli pramana*. Methods: References were sought in Google scholar, AYUSH Research portal, DHARA online, Pub med, Shodhganga, eShodhSindhu datasets and other sources like Grey literature by utilizing all the keywords and MeSH terminologies. Following PRISMA guidelines, 32 full-text eligible papers were assessed and 9 articles extracted for study design, population parameters, methodology, evaluation system, outcome and other relevant findings. Result: 5 out of 9 studies have reconfirmed that breadth of middle finger (BM) of right hand proved as more accurate method of measurement in *Anguli pramana* while in 3 studies average of right and left middle finger at proximal interphalangeal joint is used as a method of measurement. Only 1 study shows use of average of breadth of four fingers at metacarpophalangeal joints of right and left hand as a method of measurement. Discussion: Present systematic review concludes that breadth of middle finger of the right hand at proximal interphalangeal joint (BM) is the standard method of measurement for *Anguli pramana*.

Key Words: A*nguli pramana, Systematic review, Standard method, Measurement, Breadth of middle finger.*

Introduction

Anguli pramana is an ancient form of anthropometric measurement where individual's own finger width is used as a unit of measurement. In Ayurveda, the term '*anguli*' (breadth of one's own finger) has been accepted as smallest unit for measuring body parts. (1) Various references from ancient texts explain that *Pramana sharira* plays important role in determination of life span as well as the quality of life. The persons having appropriate measurement may attain a long span life span and prosperity; with moderate and poor measurements, they may attain medium and short lives respectively. (2) It is a unique method of assessment of health and nutritional status of an individual. Different researchers had attempted to standardize the *Anguli pramana*.

In ancient method of measurement exactly which finger should be used for measurement is not mentioned by *acharya* Charak and Sushruta. But there are some references in classical texts like Kautiliya Arthashastra and Sharangdhar Samhita in this regard. Said references reveal that *Anguli pramana* can be taken as,

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1. Width of middle finger at proximal interphalangeal joint, (3) (4)
2. Width of proximal end of nail of thumb, (4) (5)
3. Measurement obtained by taking width of the palm and then dividing it by four. (6) (7)

Considering such kind of various opinions about *Anguli pramana* there was a pressing need to find out standard method of measurement technique in *Anguli pramana*. Present systematic review includes all the previous studies in concerned topic i.e. both *Anguli pramana* and standard method of measurement of the same as primary or secondary outcome. This systematic review aims to review all the published literature and to provide comprehensive details on *Anguli pramana*.

Materials and methods
Literature Search Strategy

The preferred reporting items of systematic review and meta-analysis (PRISMA) guidelines were followed while conducting this systematic review. (8) The studies in this systematic review were selected on the basis of protocol described in (9) that defines the search strategy, inclusion criteria, information extraction process etc.

A systematic search was conducted on six libraries or databases including Google scholar, AYUSH Research portal, DHARA online, Pub med, Shodhganga, eShodhSindhu and other sources like Grey literature by utilizing all the keywords and MeSH terminologies related to the topic of interest. Table 1 shows search strategy based on key words for various

datasets. The search was performed in April 2020. There was no time limitation in the search period.

Table 1. Search strategy based on keywords for various datasets

Dataset	Query	Items found
Google scholar	A n g u l i p a r i m a n, anthropometry, *rachana sharir*, *shareera rachana*, *p r a m a n a s h a r i r*, anthropometric study, pilot study, standardization, a n t h r o p o m e t r i c measurements, middle finger width (using Boolean logics AND, OR, NOT).	2680
AYUSH Research portal	-do-	7
DHARA online	-do-	7
Pub med	-do-	6
Shodhganga	-do-	3
eShodh Sindhu	-do-	5
Grey literature sources	-do-	3

Inclusion and Exclusion criteria

This study focused on *Anguli pramana*, an ancient method of body measurements. In order to be included, the article must have reported data about both *Anguli pramana* and standard method of measurement of it as primary or secondary outcome. We excluded editorial, letters and meeting abstracts. Inappropriate articles were excluded from the study for following reasons; a) not related to topic, b) irrelevant data for analysis, c) unavailable abstract or full-text, d) review articles. Two authors conducted this step to evaluate the eligibility of each article. Afterwards, qualification of each article was assessed by reading the full-text; in addition a manual search was also performed by screening the reference list of the selected articles. In case of conflict, opinion of third author was sought. The qualified articles were subjected to the next step of data extraction.

Data Extraction

The data was extracted concerning the purpose of the study: first author, year, study design, number of participants, parameters, age, remark 5 of assessment, outcome and other relevant findings. Importantly, we extracted the method of measurement for *Anguli pramana*. When study reported several parameters or models with different degree of adjustment, we extracted all of them in order to get further information. The analyses which exceeded or didn't fit the purpose of this review were not considered.

Results

Study Selection

Following a systematic search that mainly focused on *Anguli pramana* and standard method of measurement as primary or secondary outcome, we retrieved 2680, 7, 7, 6, 3, 5 and 3 articles from Google scholar, AYUSH Research portal, DHARA online, Pub med, Shodhganga, eShodhSindhu and other sources like Grey literature respectively. Thus, we identified 2711 potentially relevant records utilizing all the keywords and MeSH terminologies related to the topic of interest. Subsequently duplicate records were removed. After that, the titles and abstracts of the remaining records were screened for eligibility leading to extraction process. Finally, 32 articles were included for full-text screening and 9 qualified articles remained for the process of data extraction. Complete workflow is displayed in Figure 1.
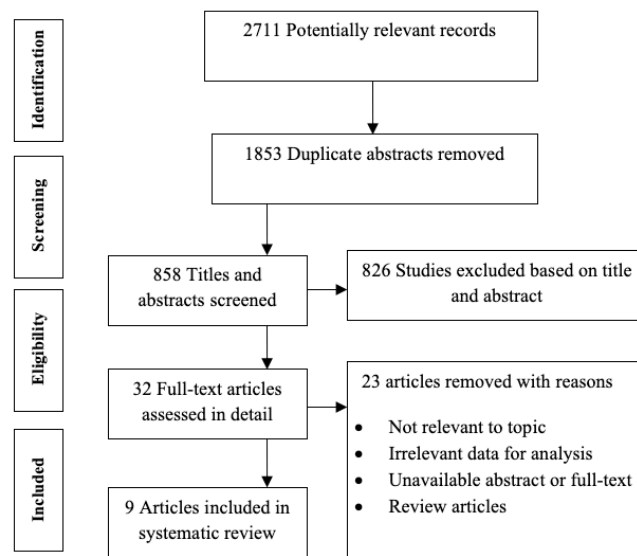
Figure 1. Flow chart of data selection process

Characteristics of Selected Studies

The main characteristics and results of the selected articles are shown in Table 2. We found nine original articles assessing the correlation of method of measurement and *Anguli pramana*. All of the studies were conducted in different parts of India and all of them including apparently healthy participants. Most of the study includes a representative sample of minimum 60 participants which itself indicates the quality of the study. All the articles included in this systematic review are published between 2013 and 2019. The sample size ranges from 60 to 1000; and the age of participants ranges from 16 to 70 years. All the studies were observational in study design.

Table 2. Characteristics of Selected Studies

Author Year	Study design	Participants	Parameters	Age	Remark of Assessment	Outcome	Other findings
S. Muley 2013 (10)	Observational	N=100	*Aayam, vistar*	16-70	Coefficient correlation between aayam & vistar	Correlation (0.24) between *aayam* & *vistar*	Average of Rt. & Lt hand mediolateral proximal interphalangeal joint of middle finger
R. Pai 2017 (11)	Observational	N=1000	Limbs, thorax, abdomen, head & neck length and cir., stature, *prakruti*	25-45	One way ANNOVA	No significant Difference between *pramana* in 3 different *Prakruti* and also with *granthokta pramana*	Width of middle finger seems to be more relevant than other methods
R. Sharma 2015 (12)	Observational	N=150	*Shir, skandha, aratni, prabahu, prapani,* jangha, uru, janu, *gulpha, parshni* length &cir, *prakruti*	18-30	One way ANNOVA test	No significant difference between *granthokta pramana* and each *prakruti* in different age except for head Cirumference and length of thigh	Width of proximal inter phalangeal joint of middle finger preferred for measurement
A. Shilwant 2018 (13)	Observational	N=100	Cirumference of chest	17-22	Mean & range of chest circumference	70.97% subjects showing extensively wide chest indicates major contribution of *kapha dosha*	Average of distance between medial & lateral edges of middle finger of both upper extremities
N. Jain 2017 (14)	Observational	N=100	Length & circumference of lower limb	18-30	Mean, S.D.	Maximum variation obtained in *Uru aayam* & *Jangha aayam*	Various parameter values measured by BM Were nearer to samhita values
S. Sharath 2013 (15)	Observational	N=100	Length and circumference of *Jangha,* standing ht, ht. with arms rose	20-60	Pearson's correlation coefficient	Positive correlation between mean tibial length & height of individual	BM is accepted as a tool of measurement
S. Phule 2019 (16)	Observational	N=60	Total 43 *pratyangas* of the body, physical fitness	20-30	Chi-square test	Positive correlation *Charakokta Anguli pramana* and Physical fitness	Average of Breadth of four fingers at Metacarpo phalangeal joint of Rt & Lt hand
S. Bhutada 2018 (17)	Observational	N=60	*Bahu* (upper limb), *prakruti*	17-22	Mean, S.D.	63.33% subjects showing *Pralamba bahu* involves *Kapha dosha* in their constitutional make-up	Average of distance between medial & lateral edges of middle finger of both upper extremities
Singh A. 2015 (18)	Observational	N= 100	Head circumference, stature	25-45	Linear regression equation	Definite correlation between stature and head measurements	BM is more accurate for measurement
Total = 9							

BM: Breadth of middle finger at proximal interphalangeal joint, Cir: circumference, Ht : height, *aayam*: human height, *vistar*: arm span, *Shir*: head, *Skandha:* shoulder joint, *Aratni*: distance from elbow joint to little finger, *Prabahu*: distance from shoulderjoint to elbow joint, *Prapani*: from elbow to wrist joint, *Jangha*: from knee joint to ankle joint , *Uru*: hip joint to knee joint, *Janu*: knee joint, *Gulpha*: ankle joint , *Parshni*: heels, *Pratyanga*: body parts, *prakruti*: constitutional make-up, *Granthokta*: as per classical text, *Kapha dosha*: one of the constitutional entity, *Uru aayam*: length of thigh, *Jangha aayam*: length of leg, *Pralamba bahu*: extensively long hanging upper extremity.

Discussion

This systematic review shows that all the 9 studies included are observational in study design. In study (10) there is partial positive correlation between *aayam* (human length) and *vistar* (arm span) when measurements taken with the average of right and left hand mediolateral proximal interphalangeal joint of middle finger in centimetre as one *angul* (unit of measurement). Along with this, study confirms that measurement of *Anguli pramana* with breadth of middle finger (BM) is more accurate than the commonest method i.e. average of four fingers of right and left hand. The study (11) reflects on relation between *Pramana* (body measurements) and different *Prakruti* (constitutional make-up). It also confirms that measurements taken with the width of middle finger (BM) is more relevant than other methods. The study (12) deals with assessment of *Prakruti* (constitutional make-up) using proforma. This study shows closer relation of features of each *prakruti* (constitutional make-up) assessed is found in concurrence with classical text, except for head circumference and length of thigh. Width of interphalangeal joint of middle finger (BM) is preferred for measurement. The study (13) deals with chest measurement only with outcome stating that 70.97% subjects having extensively wide chest indicating major contribution of *kapha dosha* (one of the constitutional entity). Researcher has taken average of distance between medial & lateral edges of middle finger of both upper extremities. The study (14) includes measurement of left lower limb parameters taken by left BM. Maximum variation obtained in *Uru aayam* (length of thigh) and *Jangha aayam* (length of leg). The study (15) states positive correlation between mean tibial length and height of individual where Breadth of middle finger (BM) is accepted as a tool of measurement. The study (16) focused on the correlation of Charakokta *Anguli pramana* and physical fitness showing positive correlation between the same. Here, measurement tool used is average of breadth of four fingers at metacarpophalangeal joint of right and left hand. The study (17) reveals the assessment of upper limb measurement and *prakruti* (constitutional make-up) which states that 63.33% subjects showing *Pramaba bahu* (extensively long hanging upper extremity) involves *Kapha dosha* (one of the constitutional entity) in their constitutional make-up. The study (18) reflects definite correlation between stature and head measurements as well as BM is more accurate method for measurement.

Out of nine, two studies (11) (12) have taken one way ANNOVA test for statistical analysis. Two out of nine studies (10) (15) analyzed the data using Pearson's correlation coefficient. The studies (14) and (17) measured the outcome based on Mean and S.D. The study (13) used mean and range for analysis. Chi-square test is used in study (16) and Linear regression equation in study (18).

Out of nine studies, four studies (11) (12)(13) and (17) based on association of *Anguli pramana* and *Prakruti*. One study (16) shows association of *Anguli pramana* with physical fitness while rest of the four

studies (10) (14) (15) and (18) are exactly base on measurement of body parts as parameters as primary outcome. These all are the main outcomes of the concerned studies whereas we extracted that five studies (11) (12) (13) (16) and (17) showed the standard method of measurement as secondary outcome.

Out of nine studies five studies (11) (12) (14) (15) and (18) have reconfirmed that Breadth of middle finger (BM) of right hand stands as more accurate method for measurement of *Anguli pramana* while in three studies (10) (13) and (17) average of right and left middle finger at proximal interphalangeal joint is used as a tool of measurement. Only one study (16) out of nine selected studies shows use of average of breadth of four fingers at metacarpophalangeal joints of right and left hand as a tool of measurement.

The shortcomings of this systematic review can be stated as very few studies on *Anguli pramana* are reported as PG dissertations mostly unpublished. Those which are published are also limited to association of *Anguli pramana* with life span, stature, *prakruti* (constitutional make-up) and physical fitness. Very few studies are focused on the core areas of standard method of measurement of *Anguli pramana*.

Conclusion

Individualistic approach is the specialty of ancient *Anguli pramana*; hence individual's own finger width is used as a tool of measurement of various human body parts. On the basis of present systematic review, it may be concluded that breadth of middle finger of the right hand at proximal interphalangeal joint is the standardized tool of measurement for *Anguli pramana*. Anthropometric measurements by *Anguli pramana* can be used for future epidemiological studies and serve as non-invasive public health marker for prediction of future risk of disease and to work out on preventive strategy. *Anguli pramana* is quite subjective or individualistic to implement, we hope that this Systematic review will bring objectivity to *Anguli pramana*. This systematic review will be served as source for other researchers for reference.

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