



PLAY AND LEARN YOGASANA WITH CHESS GAME: CORRELATIONS WITH GHERANDA SAMHITA'S ASANAS

Sadhana Dadhore¹, G.Paran Gowda²

¹Ph.D. Research Scholar, University of Patanjali, Haridwar, India.

²Professor, University of Patanjali, Haridwar, India.

Abstract: The major objective of the paper is to propose a novel method of awakening the potentially dormant energy in learning the Yogasanas through the modified Chess game. It is hypothesized that one can practice Yogasanas and build the body and mind through Chess game. All 32 pawns (both white and black pieces) are chiselled with 32 yogasanas based on each pawn's power and position. When two playing opponents move their respective pawn positions, simultaneously they are moving with all 32 asana pawns in each move. The probabilities of getting skilled in yogasanas about the pawn positions are tested with 300 adolescents age group between 12-16 years from the secondary education schools. An Item questionnaire of 20 values of yogasanas, questionnaire is prepared. Psychometric analysis of data is carried out using SPSS. The Validity and Cronbach's alpha values are found to be 0.84 and 0.66 respectively. The KMO measure of sampling adequacy and Bartlett's test of sphericity is found to be 0.712. Factor analysis is carried out and correlation values are found to be highly significant at $p < 0.0005$. Incorporating Yogasana based education curriculum in schools may be useful in building the physical and mental capabilities of the students.

Keywords: Education, Yogasana, Chess Game.

Introduction: Gheranda Samhita¹ talks about seven limbs of yoga which is called as Saptanga yoga. Out of these seven limbs, we have selected one of the limbs viz; yogasana in this study and it is correlated with chess game. In our earlier research paper², we focussed on

Patanjali eight limbs of yoga, while in this paper, selected Grihanda's 32 asanas which is more appropriate to the chess game. Sahay, G.S.³ prescribes different do's and don'ts in practicing yogasanas and gives a protocol of the same. Practice of asanas bestows mental stability and strong physical body for better growth of the personality. Yogic practices and specially asanas is a complex practices. Sage Gheranda⁴ makes it simple in assuming particular position of the body and for maintenance of final position without any type of physical stress. Physical aspects of the asanas

For Correspondence:

sadhnadadhore112@gmail.com.

Received on: June 2018

Accepted after revision: July 2018

DOI: 10.30876/JOHR.6.3.2018.205-212

totally associated with the quality of one's body and mind. The mental aspect of asana has been given more importance. Stability as well as pleasurable feelings is two very important effects of asana. The practice of asana brings stability of mind along with body and also gives a pleasurable feeling. These feelings in the adolescent groups are to be awakened through pleasurable games like the one we have chosen in our studies in the form of a modified chess game. To be on the winning note in the chess game of yogasanas, one has to be prepared to fight the best of grand masters⁵ in the world. One has to be equipped enough with proper tools to prepare for competition among the teenagers, school children, college students and general public. The present day adults dismiss yoga as a boring and a fantasy world and hence it is not pragmatic and therefore irrelevant. This presumption weighs so heavily with most modern youth that they hardly pay attention to the efficacy of even the scientifically verifiable Yoga education is a model of self-development. Our hypothesis is that yoga education can improve the Physical and mental health of the students in schools, colleges and also for general public⁶. The study carried out by Gumedde, K., & Rosholm, M.⁷ in 2015 shows improvement in mathematical and analytical skills by playing chess games in the secondary education schools – especially the dropout students. Results demonstrated that chess is an effective educational tool for enhancing mathematical ability. Another study⁸ show the potential of using chess game in cognitive psychology. The frontal and parietal cortices of the brain parts are the main regions thought to be involved in long term memory⁹, conclude that learning the skills of playing the chess game is considered to be one of the most challenging mental activity. Peplow¹⁰ says that Chess experts gain the edge over opponents by falsifying their own ideas. Study of Burgoyne, A. P.¹¹ results shows the positive correlation between cognitive ability and chess skill. One more study¹² results suggest that chess instruction improves children's mathematical,

reading, and cognitive skills moderately. Another study¹³ Results are modulated, particularly in the area socio affective, by the personal profile of students who choose practice this activity. In the study of Bodie, G. D. et al¹⁴ study builds on research from education and cognitive psychology on chunking, priming, and active learning and proposed an innovative, blended teaching method (concept keys), the utility of which is in its capability to present complex skill sets in manageable units of information and thus allows students time to reflect on and incorporate such information into their scheme of what it means to be socially competent. A case study is presented to establish the potential for this approach and to propose a call for further research. Gobet, F., & Campitelli, G.¹⁵ declares that chess game makes kids smarter, chess increases mathematical abilities. Chess improves academic performance. Numerous similar claims have been made about the efficacy of using chess to foster education (see, for example, several papers on the USCF site for education). Indeed, schools in various countries (e.g., USA, France, and Argentina) offer chess as an optional subject, and some even propose compulsory classes. There is clearly a strong interest worldwide in the potential advantages of chess in education, and the conference from which this book stems is just another example of this interest. Implicit in all these activities is the belief that skills acquired playing chess can transfer to other domains of satisfaction and carrier building. Yoga method of playing the chess game is another method of playing chess which we are proposing in this paper.

Aim: The aim of the study is to educate the adolescents about yogasana and improve the physical and mental stability with its practical implementation by playing Yogasana Chess Game (YCG) in the schools.

Objectives

- I. Designing appropriate Yogasana oriented educational YCG board.
- II. KMO and Bartlett's test for reliability of Items.

III. Factor analysis of YCG and CG.

Hypothesis: It is hypothesized that “one can practice Yogasanas and build the body and mind through Chess game”.

The proposed hypothesis is based on the experiences gained by the chess grand masters over amateurs and deep blue computers^{10, 11, 12, 13, 14}. The chess game amateurs and computers have a readymade set of pawn movement ideas than the instant grand masters decision to move the pawns appropriately and correctly. The masters could recall their memories based on the net/current experience while the amateurs and computers depend on their pre-planned stored memory data. This makes a big difference in playing conditions. Though the grand master Kasparov was beaten by deep blue computers but still he could come nearer to the computer chess game². Hence the above hypothesis is proposed for our study to improve the mental stability as well as physical health.

Methodology: We have selected 300 subjects out of 630 participants. There are 107 males and

193 females. The mean age is 14.5±SD. They were all in adolescent age group studying in 6th-10th standard boys and girls of Kendriya Vidyalaya, Bhopal region, India.

Need for the YCG Study: The need for the Yogic Chess Game study arises because of competition between man and machine². Royal game of Chess bears 64 boxes⁷ and out of which 16 boxes on each side are being covered by the 32 yogasanas pawn forces on both sides. The royal game is being played by two contestants. This yogic chess game has some important rules & regulations.

Design of the Yogic Chess board: The conventional rules of the chess game play are given in many text books¹⁵. The conventional chess board is modified and designed appropriately to suit the concept of Gheranda Samhita’s 32 yogasanas. Each pawn in the chess board is identified with one asana and accordingly all 32 Grihandaasanas are selcted and played. Table 1 gives the design and development of the chess board (Fig. 1).

Table 1-Design of the Yogic chess board

S. No.	Mate Values (16 Asana Pawns)		Opponents Values (16 Asana Pawns)	
1	Meditative pose (Siddhasana)	King	King	Auspicious pose (Swastikasana)
2	Gracious pose (Bhadrasana)	Queen	Queen	Secret pose (Guptasana)
3	Yogi Gorakhnath’s pose (Gorakshasana)	Right Bishop	Left Bishop	Locust pose (Shalabhasana)
4	Contracted Pose (Sankatasana)	left Bishop	Right Bishop	Peacock pose (mayurasana)
5	Upright tortoise pose (Uttan-kurmasana)	Right Knight	Left Knight	Tortoise pose (Kurmasana)
6	Cockerel pose (Kukkutasana)	Left Knight	Right Knight	Frog pose (Mandukasana)
7	Upright frog pose (Uttan-mandukasana)	Right side Rook	Left side Rook	Camel pose (Ushtrasana)
8	Cobra pose (Bhujangasana)	left side Rook	Right side Rook	Bow pose (Dhanurasana)
9	Lotus pose (Padmasana)	1 st Pawn (Soldier)	1 st Pawn (Soldier)	Free pose (Muktasana)
10	Thunderbolt pose (Vajrasana)	2 nd Pawn (Soldier)	2 nd Pawn (Soldier)	Lion pose (Simhasana)

11	Cow face pose (Gomukhasana)	3 rd Pawn (Soldier)	3 rd Pawn b(Soldier)	Hero's pose (Virasana)
12	Corpse/death pose (Mratasana)	4 th Pawn (Soldier)	4 th Pawn (Soldier)	Posture of union (Yogasana)
13	Fish pose (Matsyasana)	5 th Pawn (Soldier)	5 th Pawn (Soldier)	Yogi Matsyendranath's pose (Matsyendrasana)
14	Back stretching pose (Paschimottanasana)	6 th Pawn (Soldier)	6 th Pawn (Soldier)	Pose for Difficulties (Utkatasana)
15	Tree pose (Vrikshasana)	7 th Pawn (Soldier)	7 th Pawn (Soldier)	Eagle pose (Garudasana)
16	Bull pose (Vrashasana)	8 th Pawn (Soldier)	8 th Pawn (Soldier)	Crocodile pose (Makarasana)

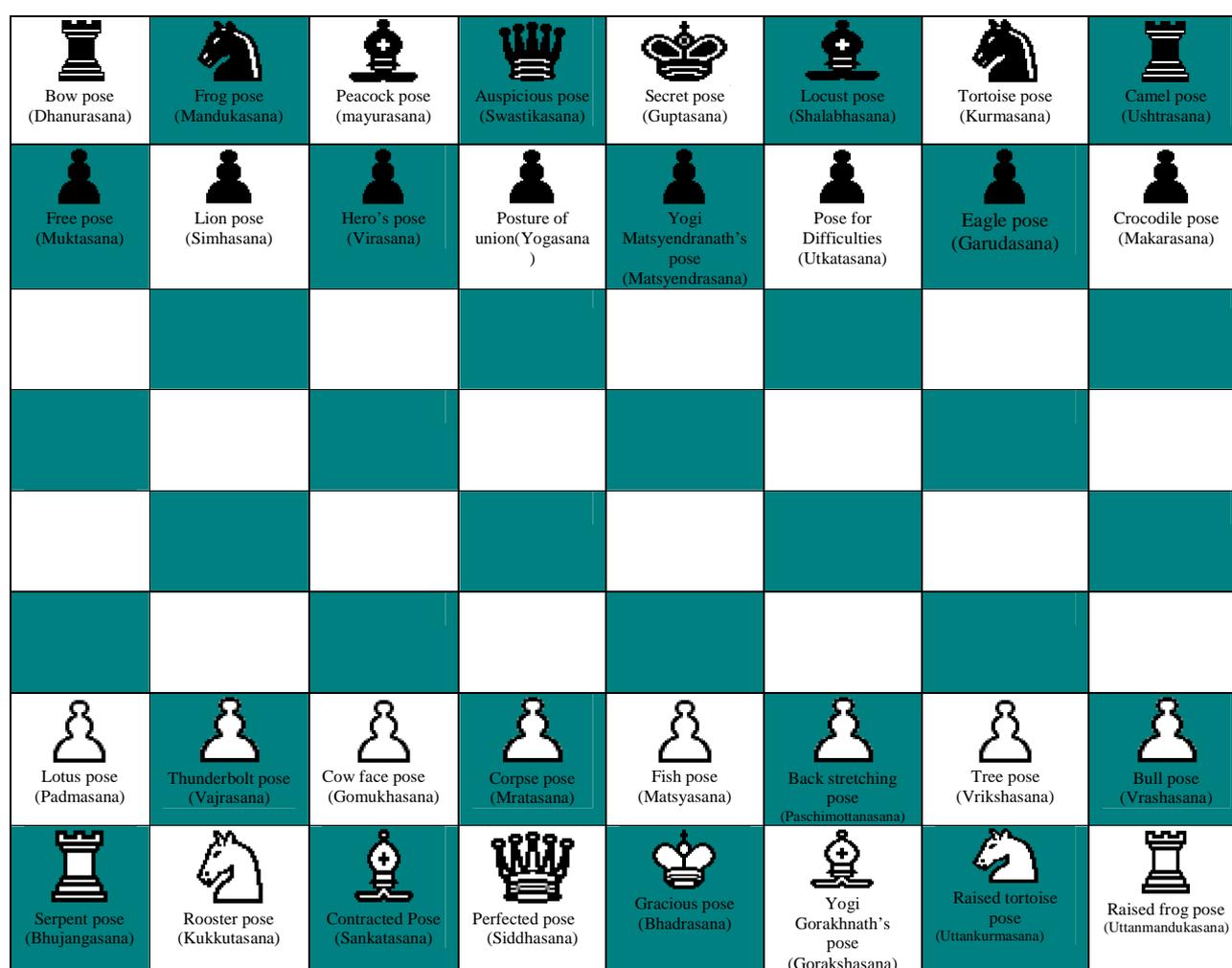


Fig.1. Design of Yogic Chess Board

Face validity: Based on the respondent's views and impressions, we have selected a sample size of 300 out of 630 subjects. In the beginning, the students were not serious enough to answer the questions. When explained about the objectives

of the questionnaire, they were thrilled and excited to fill the questionnaire. All 20 items were put before the subjects and they felt comfortable with and were willing to answer. It means, each statement should give the same

meaning to the researcher and respondent. The questionnaire was tested with a pilot sample of 25-40 people and got their feedback. Based on the observations and feedback, we took review and modified the questions in a simpler way.

Content Validity Index

Items or statements are tested whether they are in conformity to the concept being studied. These have been done by 4 experts in the relevant field of research. The experts have given rate for each statement according to the level of relevance of the statement with the

concept. Final score given by the experts are calculated using Content Validity Index formula. The CVI values are found to be 0.9.

Results and Discussion: Table 2 shows the case processing summary of the 20 items for a given size of N=300. The percentage validity of the cases is found to be 99.70%. The reliability of the factors is tested with Cronbach’s alpha test. The value is found to be 0.66 (Table 3) which is an acceptable limit though not appreciable.

Table 2: Case Processing Summary

		N	%
Cases	Valid	300	99.7
	Excluded ^a	1	.3
	Total	301	100.0

a. Listwise deletion based on all variables in the procedure.

Table 3: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.666	.659	20

Table 4: Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	2.254	2.060	2.447	.387	1.188	.011	20

Table 5: ANOVA

		Sum of Squares	Df	Mean Square	F	Sig
Between People		555.728	299	1.859	5.398	.000
Within People	Between Items	63.675	19	3.351		
	Residual	3526.975	5681	.621		
	Total	3590.650	5700	.630		
Total		4146.379	5999	.691		

Grand Mean = 2.2545

In Tables 4 and 5, the highly significant variant values are found to be at $p < 0.0005$ at confidence interval of 95%. The ‘F’ value is found to be 5.398. KMO and Bartlett’s value is found to be 0.712, shown in Table 6. This indicates the reliability of the sample size which is ‘middling’ value (Aron, A. 2013) which is little lesser than meritorious value.

Table 6: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.712
Bartlett's Test of Sphericity	Approx. Chi-Square	804.264
	Df	190
	Sig.	.000

Finally factor analysis is carried out and their correlation coefficients are given between different item values are shown in Table 7. The designed 1-20 items are selected based on the Gheranda Samhita (Saraswati, N. 2012). These Gheranda asanas are identified with different asanas in the form of 2-3 asanas for 1 item. Like for example, “I am stable” item is identified with Siddhasana and Gomukhasana. Like-wise all 32 asana are identified with different items as shown in Table No.7. Two or 3 asanas are justified in terms of the benefits which are reflected in the single question. The benefit I am

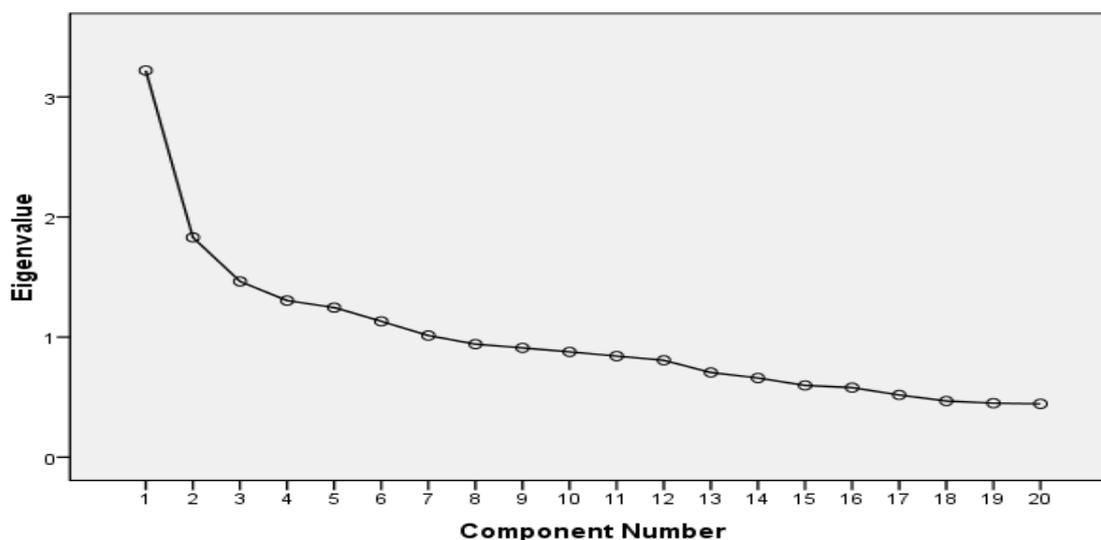
stable reflects the building up of physical stability and increased energy with establishing control over the secretion of hormones. Similarly, the other extracted items have different correlation values. In Table 7 all correlation values are shown for all 20 items.

Scree plot (Fig.2) gives the component extracted 20 items versus Eigen values. The value gets gradually tapered off with component matrix value of unity diagonal matrix having 20 items.

Table 7: Statistical Correlation between Items and Yogasanas

S.No.	Items	Identified asanas	Correlation
1	I am Stable	Siddhasana, Gomukhasana	.599
2	In stable position I feel Happy	Bhadrasana, Mritasana	.700
3	My body is strong enough	Veerasana, Utkatasana	.727
4	All my body system are working well	Vajrasana, Dhanurasana	.645
5	My body is Flexible	Swastikasana, Matsyendrasana	.643
6	I sit straight in the class	Padmasana, Yogasana	.599
7	I am Glorious	Gorakshasana, Kukkutasana	.638
8	I can stay for a long time in Oneposture without any move	Muktasana, Matsyasana	.667
9	I am health conscious	Uttan-mandukasana	.516
10	I can face worst situations	Sankatasana, Kurmasana	.516
11	I have strong will power	Simhasana, Bhadrasana	.662
12	My digestion is good	Mayurasana, Ushtrasana	.657
13	I don't have any disease	Muktasana	.609
14	I can sit for a long time effortlessly	Padmasana, Veerasana	.584
15	My BMI (Body Mass Index) is in limit (Normal BMI Range=18.5-24.9)	Shalabhasana, Bhujangasana	.659
16	My spine is healthy enough	Paschimotasana	.697
17	I can face worst situations	Veerasana	.657
18	I am practiceYogasanas regularly	Vriksasana, Utkatasana	.658
19	I am will-ful	Matsayasana, Guptasana	.735
20	I keep energetic	Mayurasana	.639

Fig. 2: component extracted 20 items versus Eigen values Scree Plot



Conclusion: The outcome of three stated objectives of the study viz; designing the conventional chess board with Yogic educational values comprising 32 modified pawns with 32 yogasanas of Gheranda Samhita are fulfilled with psychometric analysis using SPSS. A highly significant variant values are found to be at $p < 0.0005$ with confidential interval of 95% shows that our stated hypothesis “one can practice Yogasanas and build the body and mind through Chess game” may be true and hence the null hypothesis may be rejected. This research study will be beneficial for all the school going students for learning yogasanas while playing chess game, simultaneously; There is a vast scope for further research in carrying out the curriculum based yoga education in different types of educational institutions.

Acknowledgment

I sincerely thank all my colleagues and students who participated in this research work and for their excellent cooperation in carrying out this work successfully.

References

1. Saraswati, S.N., (2012). *Gheranda Samhita: Commentary on the Yoga Teachings of Maharshi Gheranda*. Yoga Publication Trust, Munger, Bihar, India. 165-255.
2. Balkrishna, Acharya. D, Sadhna. G, Paran. (2018) Yoga as a mate to improve memory, Nature Journal (under pipeline). 05.06.2018
3. Sahay, G.S. (2013). *Hathayogapradipika*. Yogic Heritage Kusgaon, Lonavala. 13.
4. Mallinson, J. (2004). *The Gheranda Samhita: the original Sanskrit and an English translation*. YogaVidya. com.
5. Hänggi, J., Brüttsch, K., Siegel, A. M., & Jäncke, L. (2014). The architecture of the chess player's brain. *Neuropsychologia*, 62, 152-162.
6. Balkrishna, A. (2017). *Yoga-Play and Learn: A textbook for Yoga Education*. (edi-II). Divya Yog Mandir Trust, PatanjaliYogpeeth, Haridwar, India.
7. Gumedé, K., & Rosholm, M. (2015). Your Move: The Effect of Chess on Mathematics Test Scores.
8. Gobet, F., & Campitelli, G. (2006). Educational benefits of chess instruction: A critical review. In *Chess and education: Selected essays from the Koltanowski conference* (pp. 124-143). Chess Program at the University of Texas at Dallas Dallas, TX.
9. Demis, H. (2017). Artificial Intelligence: Chess match of the century. *Nature*. 544, 413-414.
10. Peplow, M. Science secret of grand masters revealed, Published online 6 August 2004 | Nature | doi: 10.1038/news040802-19
11. Hopkin, M. Grandmasters mate from memory, Published online 09 august 2001 | Nature | doi: 10.1038/news010809-13.
12. Horgan, D. (1987). Chess as a way to teach thinking. *Teaching, Thinking and Problem Solving*, 9, 4-11.
13. Pearson H. Kasparov to battle deep junior, Published online 24 January 2003 | Nature | doi: 10.1038/news030120-11
14. Pearson, H. Chess and Go no-brainers? Published online 12 December 2002 | Nature | doi: 10.1038/news021209-10.
15. Speelman J. Jon Speelman's Best Games. Pavilion Books; 2014.
16. Burgoyne, A. P., Sala, G., Gobet, F., Macnamara, B. N., Campitelli, G., & Hambrick, D. Z. (2016). The relationship between cognitive ability and chess skill: A comprehensive meta-analysis. *Intelligence*, 59, 72-83.
17. Sala, G., & Gobet, F. (2016). Do the benefits of chess instruction transfer to academic and cognitive skills? A meta-analysis. *Educational Research Review*, 18, 46-57.
18. Aciego, R., García, L., & Betancort, M. (2012). The benefits of chess for the intellectual and social-emotional enrichment

- in schoolchildren. *The Spanish journal of psychology*, 15(2), 551-559.
19. Bodie, G. D., Powers, W. G., & Fitch-Hauser, M. (2006). Chunking, priming and active learning: Toward an innovative and blended approach to teaching communication-related skills. *Interactive learning environments*, 14(2), 119-135.
20. Gobet, F., Retschitzki, J., & de Voogt, A. (2004). *Moves in mind: The psychology of board games*. Psychology Press.
21. Aron, A., Coups J. E., Aron, N. E. (2013). *Statistics in Psychology*. Delhi, (edi. -VI).