

Designing and Developing Yogic Chess Board Game for Adolescents to Teach *Ashtanga Yoga* An Innovative Learning Methodology

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Abstract

Chess is a two-player strategy board game, which has been used as a teaching tool for different subjects. With the help of innovatively designed and developed yogic chess game, the extract of Patanjali's Ashtanga Yoga has been disbursed to the adolescents in a simplified, interesting and playful manner. The creatively designed chess board has been used to understand few positive and negative effects producing terms found in yoga philosophy. Its efficacy has been tested among 50 students of Government Senior Secondary School, village Khachrauli of District Jhajjar of Haryana, India. A multiple choice questionnaire comprising 50 questions related to Patanjali's Ashtanga Yoga was designed and students' responses were collected before and after the intervention of yogic chess game module, which included theory as well as practical. Pre- and post-test data was analysed by using paired 't' test and found the t-value as -24.25, which is very much significant as the calculated p-value was found to be <0.0001. Benefit of the designed yogic Chess board game is that it may sharpen the brains with value education based on eight folds of Ashtanga Yoga at young age. A child may understand the concepts of Ashtanga Yoga positive forces and how these may be helpful to achieve the goal

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of liberation. This pilot study may be helpful to propagate the basic concepts of yoga philosophy and thus helpful in achieving the goal of National Education Policy, 2020 (NEP 2020). The education policymakers (SCERT/NCERT) may replicate it and further research may be carried out in different schools.

INTRODUCTION

Chess board game has been used by the researchers to enhance cognitive functions. Board games can be offered as a teaching tool (Gardner-Anopol, 2007). It is the need of the hour to teach the essence sage Patanjali's *Ashtanga Yoga* to the children in an interesting and play-way manner. Board games of like chess can be offered as a tool to teach the above mention topic to adolescent students. Of course, a rigorous effort will have to be made to delineate a precise, compact and meaningful pedagogy. It has been tried to explore the five *Yamas* like *Ahimsa* (without violence), *Satya* (trustworthiness), *Asteya* (not to steal), *Brahmacharya* (to pursue Brahma) and *Aparigraha* (no unwanted possession); and five *Niyamas* like *Shaucha* (purity), *Santosha* (satisfaction), *Tapa* (self-command), *Svadhyaya* (study of scriptures/self), *Ishwer-Pranidhana* (give up to Almighty); ten *Vitarkas* (opposites of five *Yamas* and five *Niyamas*) like *Himsa* (brutality), *Asatya* (non-trustworthiness), *Steya* (stealing), *Abrahmacharya* (not to pursue Brahma), *Parigraha* (unwanted possessions), *Ashaucha* (impurity), *Asantosh* (no satisfaction), *Atapa* (no self-command), *Asvadhyaya* (no study of scriptures/self), *Nastikta* (not to give up to Almighty); *Asana* (yogic

posture), *Pranayama* (yogic breathing), *Pratyahara* (inward-senses), *Dharna* (concentration), *Dhyana* (meditation) and *Samadhi* (integration); and five *kleshas* like *Avidya* (lack of knowledge), *Asmita* (egoism), *Raga* (desirefulness), *Dwesha* (hatred), *Abhinivesha* (desire to be alive) and *Kaivalya* (supreme spiritual wellness/liberation); as mentioned in sage Patanjali's philosophy. The forces of chess (Pawns, Knights, Rooks, Bishops, King and Queen) have been labelled in such a way that they could represent/symbolise important components of *Ashtanga Yoga*. Designing and developing yogic chess board game for adolescents may prove to be an efficient tool to teach *Ashtanga Yoga*. The purpose of the study is to motivate and help school students to grasp the above mentioned in a playful and joyful manner and learn value based moral education. The impact of every limb of *Ashtanga Yoga* practices such as self-restraints or *niyamas*, etc., have a significant role in social health, well-being and self-control (Brems, 2020, Sullivan, et al., 2017, Jarry, et al., 2017). Most of the commentator's common opinion is that the real purpose of yoga practice is expressed by Patanjali in verse (2.28) (White, 2019). It describes that the highest wisdom of enlightenment may be cultivated

with dedicated practice of the eight limbs of yoga which can remove the impurities of mind (five *kleshas*) and body (hindrances), thus enabling the practitioner to achieve the goal of *kaivalya* (liberation). As both theory and practical are essential in every subject of science and social science, we tried to explore both with the help of yogic chess board game in the present study to attain the ultimate benefit of supreme spiritual wellness. The study material exploring above has also been designed innovatively (Figures 1 to 15). Yoga practices may be more fruitful for the students to attain perfection, if they learn theory prior to practising it. Many yoga instructors are also in favour of the above statement. It is presupposed that theory along with practice of yoga should be a part of school curriculum. In the present study, we administered theory teaching sessions through yogic chess game as well as practical sessions also which included *asana*, *pranayama* and meditation which enabled the children to understand theory in a meaningful manner.

REVIEW OF RELATED STUDIES

In the captured study, the researchers observed significant effects on verbal memory, sustained attention and creativity after chess training (Gliga and Flesner, 2014). The captured study reveals that intellectual and socio-emotional behaviour of the students who played chess as extracurricular activity was better than those playing soccer

(Aciego, et al., 2012). The study by schools et al., that simple addition task and counting can be improved significantly using chess board game but how to sum up positive affects to conquer the negative affects was not mentioned (Scholz, et al., 2008). Joseph, et al. (2016), in their study, focused on academic performance of middle school children in rural India. Lotfi, et al. (2020) studied two distinct dimensions of emotional experiences and categorised them as positive and negative affect. High energy, pleasurable involvement, pleasant feelings and high concentration may be defined as positive affect, and humiliation, guilt and fear, hate, anger and sadness are seen as negative affect. A study by Joseph (2018) analysed the effect of one-year chess training on the processing speed of children and also established a link between both. Results revealed that there is a significant gain in processing speed among experimental group. In a reviewed study, Joseph, et al. (2017) indicated perceptual reasoning that integrated fluid reasoning, spatial processing, and visual motor integration. Statistical analysis of pre- and post-test reveals that chess training significantly improves the perceptual reasoning. A reviewed study by Ferreira and Palhares (2008), presented the context and results with children (III to VI classes) as subjects, about the relationship between chess and problem solving, involving geometric and numeric

patterns. After analysing the test scores it was verified that chess players had better scores in the test and understood numerical pattern more easily. The chess players showed a better performance in planning and suggested certain differences in flexibility which indicate that chess is very helpful in the executive functions improvement of (Grau-Pérez and Moreira, 2017). A study by (Islam, et al. (2021) found that chess training reduces the level of risk aversion almost a year after the intervention ended. The study by Trincherro (2013) reveals that chess training can significantly improve the scores of a group of children on the OECD-PISA Mathematics Scale. The results of the study by Smith (2000) show that the mathematics achievement of the experimental group was significantly higher than that of the control group. According to Khosrorad, et al. (2014), the mathematical skills, reasoning abilities and executive functions of students with mathematical disorders are quite low in comparison to normal students. After the chess game intervention to both groups of students, it was found that experimental group students were having significantly more executive functions and mathematical skills than that of the control group. Ibrahim (2014), in his review study, concluded that players may become good decision makers by practising the chess. The chess-playing students had become accustomed to looking for more and different

alternatives, which resulted in higher scores in fluency and originality. The study by Storey (2000) extolled the use of chess training as a means to promote higher order thinking skills among disabled students. This study recommended that teachers consider 'chess' as an instructional strategy for reinforcing skills such as concentration, problem identification, problem solving, planning strategies, creativity, and lucid thinking. Sigirtmac (2016) conducted a study by giving chess training for two hours to the experimental group, and at last the creativity and Theory of Mind (TOM) skills of both the groups were measured and it was concluded that the children playing chess were found to be more creative and Tom skills than the children not playing chess. Stegariu and Abalasei (2018) divided Class I students from two schools into control and experimental groups and treated the experimental group with chess practice for one semester. The measurements were made with IQ-Splash puzzle. It was concluded that chess practice may improve intellectual development. Sigirtmac (2012) treated experimental group with a chess course and took a concept test based on chess game. After the data analysis, it was concluded that there was a significant difference between the conceptual developments of both the groups which was in favour of chess group. Kazemi, et al. (2012) evaluated the experimental (chess group) and control group students with meta-cognitive questionnaire of

Panaoura, Phillippou and Christou (2003), and mathematics exam before and after the intervention. Chess players score better in both meta-cognitive abilities and mathematical problem solving skills. Sala, et al. (2015) divided 560 students of 8 to 11 years old into experimental (with chess training) and control group (with normal school activities). After chess intervention, the experimental group showed a higher improvement in mathematical problem solving abilities than the control group.

In most of the captured studies, it was found that chess game is used to evaluate the problems related to the subjects other than yoga such as cognitive functions, math scores, concentration, problem identification, problem solving, executive functions, etc. Any study on yoga related to chess could not be traced.

WHY THIS STUDY?

The present study may explore a play-way method to teach ancient yogic tradition to students, thus could be helpful in achieving the goal of National Education Policy, 2020. The educational policy is focused on surrender, patience, multiplicity, cultural diversity, noble conduct, gender equality, regards for elders/others, personality development and creating universal approach (4.28/16 NEP) so that the forthcoming generations could be enriched with career making skill development, amplify traditional Indian values and

all basic human and constitutional values such as *ahimsa* (without violence), *shanti* (calm), *swachchhata* (purity), *nishkam-karma* (altruistic-deeds), *satya* (trustworthiness), and *seva* (kindness to the society). By understanding the essence of *Ashtanga Yoga* on a specially designed 'Yogic Chess Board', adolescents may be encouraged to adopt the above mentioned values in their lives. On the yogic chessboard, children may comprehend and learn about *Ashtanga Yoga* in a play-way manner. Among other significant values, adolescents may understand how *Kaivalya* is fringed within ten *vitarkas* and five *kleshas* on one side of the field and how *Ashtanga Yoga* on the opposite side, shown as white pieces, are kept to attain supreme spiritual wellness.

OBJECTIVES

The objectives of the study are:

- (i) To design and develop a yogic chess board game.
- (ii) To explore Patanjalis *Ashtanga Yoga* philosophy on the chess board game.
- (iii) To test the statistical efficacy of the designed chess board by applying it on adolescent children.

HYPOTHESIS

H⁰: There may not be any significant effect of yogic chess board game on yoga education.

Alternatively,

H¹: There may be significant effect of yogic chess board game on yoga education.

METHOD

Sample and Sampling Procedure

A sample of 50 students (26 boys and 24 girls) was randomly selected from Classes IX to XII (of 13 to 18 years of age) from Government Senior Secondary School, Village Khachrauli, Tehsil Matanhail located in District Jhajjar, Haryana, India.

Inclusion Criteria

The students of age above 13 years and below 19 years were selected and both boys and girls have been treated at the same level.

Exclusion Criteria

We have excluded the students who were physically disabled, suffering from chronic ailments and unhealthy.

Tools and Procedure

Pre and post-test design is a random selection method in which measurements are taken before and after an intervention on the same sample. Paired statistical t -test analysis can then determine if the intervention had a significant effect. The pre-testing may also be considered as control group in the design. Students were asked to appear in pre-test, comprising a multiple choice questionnaire having 50 questions related to *Patanjalis Ashtanga Yoga*. The questionnaire was framed with the consultations of yoga experts. The questionnaire given to the candidates to solve in pre and post-test was validated with five yoga experts. We found the content validity index (CVI) 0.94 (Polit and Beck, 2006; Polit, et al., 2007) and

the obtained value of Cronbach's alpha is 0.7. Thereafter, the students were taught about *Ashtanga Yoga* (eight limbs), *Vitarkas* (opposites of *Yamas* and *Niyamas*), five *kleshas* and *kaivalya* as well as their precise meanings with the help of creatively designed and developed Yogic Chess Board (Fig. 3) and study material (Figs. 4 to 15). Before beginning the game, instructions were given to them. Daily sessions of 60 minutes for five days were conducted. For the first thirty minutes, they were taught and instructed to play the Yogic Chess Board Game. The students were allowed to move next turn only if they had answered the related yogic term mentioned on the chess piece. While answering, they were permitted to take help from the study material provided to them. For the last half an hour, they were allowed to sing a prayer, practise *Om* chanting, *Hasya yoga*, *Asanas* (*padamasana*, *tadasana*) and *Pranayamas* (*bhramari*, *anulom-vilom*), *Gyan Mudra* as well as *Trataka* (Gazing). Post-test was conducted on the last day. The data was analysed by using SPSS version 25.

Design

(i) Yogic Chess Board Design

The ordinary chess boards were purchased along with pieces for the study from the market and modified as shown hereby for experiment purpose. In the innovatively designed yogic chess board, positive and negative affects producing battle forces have been given name according to Patanjalis' *Ashtanga Yoga* philosophy.



Figure 1: Positive affect producing forces (eight folds of Ashtanga Yoga)

As illustrated in fig. 1 sixteen positive effects were selected generating values comprising eight folds like five Yamas (*Ahimsa, Satya, Asteya, Brahmacharya, Aparigraha*), five Niyamas (*Shaucha, Santosha, tapa, svadhyaya, ishwerpranidhana*); other six folds (*asana, pranayama, pratyahara, dharna, dhyana and samadhi*). On the side of positive affects producing forces, front row has comprised eight pawns labelled as *Santosha* (contentment), *Tapa* (austerity), *Svadhyaya* (study

of self or scriptures), *Ishwerpranidhana* (surrender to Almighty), *Aparigraha* (not to possess unneeded), *Brahmacharya* (to follow Brahma), *Asteya* (not to steal), and *Satya* (truthfulness) from right to left. Back row is loaded with *Shaucha* (cleanliness), *Asana* (blissful yogic pose), *Pranayama* (yogic breathing), *Smadhi* (integration), *Dhyana* (deep stage of concentration), *Dharna* (concentration), *Pratyahara* (subjugation of senses) and *Ahimsa* (non-violence).



Figure 2: *Kaivalya* (supreme spiritual wellness) encircled with Negative forces (ten vitarkas and five kleshas)

As illustrated in Fig.2, ten *vitarkas* (opposites of five *yamas* and five *niyamas*), like *himsa*, *asatya*, *steeya*, *abrahmacharya*, *parigraha*, *ashaucha*, *asantosha*, *atapa*, *asvadyaya*, *nastikta* five *kleshas*/obstacles (*avidya*, *asmita*, *raga*, *dvesha*, *abhinivesha*) as negative affects producing deeds/forces selected from Patanjali Yoga Sutras on the chess board. Negative affects generating forces like *Asatya* (non-truthfulness), *Steeya* (to steal), *Abrahmcharya* (not to follow Brahma), *Parigraha* (unneeded possession), *Nastikta* (no surrender to almighty), *Asvadyaya* (not to study scriptures or self), *Atapa* (shirk work), *Asantosha* (no contentment) (Fig. 8) and in the back row are *Himsa* (violence), *Dwesha* (aversion), *Abhinivesha* (fear of death), *Avidya* (wrong knowledge), *Asmita* (egoism), *Raga* (attachment), *Ashaucha* (impuring) and one

target *Kaivalya* (supreme spiritual wellness) (Fig.7), (*Sadhan Pada-3*) (Karambelkar, 1987). The concept of *Ashtanga Yoga* chess game is to attain *Kaivalya* (supreme spiritual wellness) which is encircled by 15 negative effects producing the forces stated above.

Possible moves of pieces have been well explained in the study material design. The conceptualisation of positive and negative forces, e.g., *Yamas*, *Niyamas*, other six limbs of *Ashtanga Yoga*, *Vitarkas*, *Kleshas* and *Kaivalya* (super wellness) are designed and described in the Figs. 4 -15.

After discussions with experts about the designed Yogic Chess Board, their valuable suggestions were taken into account for modifications. According to their recommendations the board was improved and finalised.

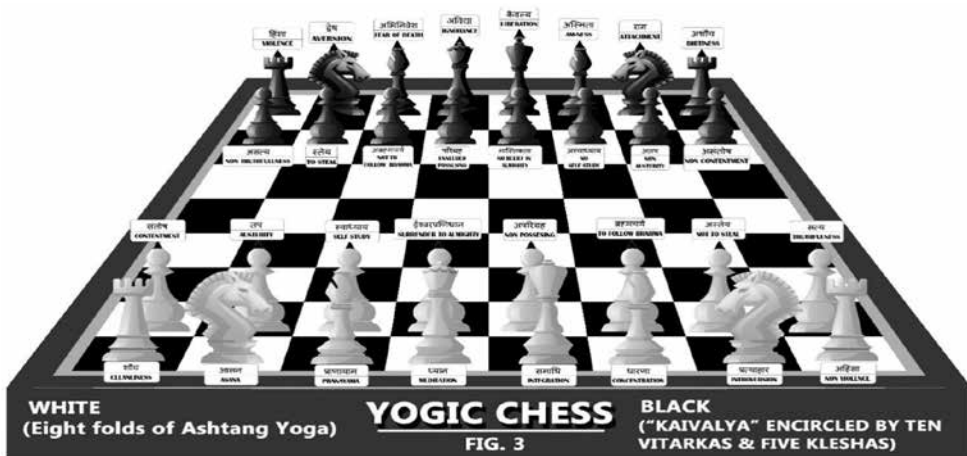


Figure 3: Positive and negative affects producing forces of Ashtanga Yoga on the chess board. *Kaivalya* (supreme spiritual wellness) is fringed with ten *vitarkas* and five *kleshas*. Eight path yoga on the opposite side is shown as solution

(ii) Study Material Design

The study material for the students has been designed in such a way that they can understand the conceptualisation of the contents with the help of illustrated figures given below. Possible moves, placement of the back row positive forces, front row positive forces, front row negative forces, back row negative forces, conceptualisation of *yamas*, *niyamas*, *vitarkas* (opposite to *yamas* and *niyamas*), *kleshas* and other six limbs of *ashtanga yoga* and how *kaivalya* is fringed have been well explored in Figs. 4–15, respectively. This study material was provided to the students to bring daily in sessions as well as to revise and learn at home.

DATA ANALYSIS

By using paired ‘t’ test, data obtained in pre-and post-test was analysed


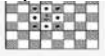





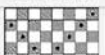










			horizontal or diagonal	
2	QUEEN(Q) 		QUEEN: Moves to any distance vertically or horizontally	
3	BISHOP (B) (CAMEL) 		BISHOP 4 BISHOPS Moves in any distance diagonally	
4	KNIGHT (N) (HORSE) 		KNIGHT: Moves in the field two fields along the vertical and one horizontally one field vertically & two horizontally	
5	ROOK (R) (ELEPHANT) 		ROOK: Moves to any distance vertically or horizontally	
6	PAWN (SOLDIER) 		PAWN: Moves to one field forward or two fields at the first move, beats diagonally to one field forward	

Figure 4: Chesspieces Panas









							
R	N	B	K	Q	B	N	R
SHAUCHA	ASANA	PRANAYAMA	SAMADHI	DHYANA	DHARNA	PRATYAHARA	AHIMSA
CLEANLINESS	BLISSFUL YOGIC POSE	SPECIFIC BREATHING TECHNIQUE	INTEGRATION	DEEP STAGE OF CONCENTRATION	CONCENTRATION	SUBJUGATION OF SENSES	NON VIOLENCE

Figure 5: Back row positive affects: white rooks, knights, bishops, queen and king



							
SANTOSHA	TAPA	SWADHYAYA	ISHWER PRANDHANA	APARIGRAHA	BRAHMCHARYA	ASTEYA	SATYA
CONTENTMENT	NOT TO SHIRK WORK	TO STUDY SELF/SCRIPTURES	SURRENDER TO ALMIGHTY	NOT TO POSSESS UNNEEDED	TO FOLLOW BRAHMA	NOT TO STEAL	TRUTHFULNESS

Figure 6: Front row positive affects: eight white pawns








							
R	N	B	Q	K	B	N	R
HIMSA	DWESHA	ABHINIVESHA	AVIDYA	KAIVALYA	ASMITA	RAGA	ASHAUCHA
VIOLENCE	AVERSION	FEAR OF DEATH	WRONG KNOWLEDGE	LIBERATION	AM-NESS	ATTACHMENT	DIRTINESS

Figure 7: Back row negative affects: black rooks, knights, bishops, queen and king









							
ASATYA	STEYA	ABRAHMCHARYA	PARIGRAHA	NASTIKTA	ASVADHYAYA	ATAPA	ASANTOSHA
NON TRUTHFULNESS	TO STEAL	NOT TO FOLLOW BRAHMA	TO POSSESS UNNEEDED	NO SURRENDER TO ALMIGHTY	NOT TO STUDY SELF/SCRIPTURES	SHIRK WORK	NO CONTENTMENT

Figure 8: Front row negative affects: eight black pawns






WELLNESS THROUGH YAMAS	NAME & POSITION	CONCEPT	DESCRIPTION	MOVEMENT INFORMATION
	ROOK: LEFT CORNER	AHIMSA	NOT TO HARM No violent behavior with anyone either physically, mentally as well as verbally which results in no injury	ROOK: Moves to any distance vertically or horizontally
	PAWN: EXTREME LEFT (FRONT ROW)	SATYA	TRUTHFULNESS A habit of speaking truth either physically, mentally as well as verbally. Enables to know the results of actions	PAWN: Moves to one field forward or two fields at the first move, beats diagonally to one field forward
	PAWN: RIGHT TO EXTREME LEFT (FRONT ROW)	ASTEYA	NOT TO STEAL Not to take anything without permission of owner either physically, mentally as well as verbally. Enables to achieve goals	SAME
	PAWN: SECOND RIGHT TO EXTREME LEFT (FRONT ROW)	BRABHACHARYA	TO FOLLOW BRAHMA To follow the instructions laid by sages either physically, mentally as well as verbally. Enables to get vigor and vitality	SAME
	PAWN: THIRD RIGHT TO EXTREME LEFT (FRONT ROW)	APARIGRAHA	NOT TO POSSESS MORE THAN NEEDED Not to hoard more than required either physically, mentally as well as verbally. Enables to know the purpose of life	SAME

Figure 9: Conceptualisation of Yamas






WELLNESS THROUGH NIYAMAS	NAME & SITUATION	CONCEPT	DESCRIPTION	MOVEMENT INFORMATION
	ROOK: RIGHT CORNER (BACK ROW)	SHAUCHA	CLEANLINESS Clean up at all levels physically, mentally as well as verbally. Enables to get rid of attractions among others and self-body	ROOK: Moves to any distance vertically or horizontally
	PAWN: RIGHT (FRONT ROW)	SANTOSHA	CONTENTMENT Attain satisfaction physically, mentally and verbally. Enables to achieve supreme bliss/happiness	PAWN: Moves to one field forward or two fields at the first move, beats diagonally to one field forward
	PAWN: LEFT TO EXTREME RIGHT (FRONT ROW)	TAPA	AUSTERITY Working hard to achieve the goal with sincere efforts physically, mentally and verbally. Enables to remove toxins from body	SAME
	PAWN: SECOND LEFT TO EXTREME RIGHT (FRONT ROW)	SVADHYAYA	STUDY OF SCRIPTURES OR SELF To hoard knowledge through learnings physically, mentally and verbally. Enables to get connected with deities	SAME
	PAWN: THIRD LEFT TO EXTREME RIGHT (FRONT ROW)	ISHWER PRANDHANA	SURRENDER TO ALMIGHTY To pray, worship with full devotion physically, mentally and verbally. Enables to attain integration	SAME

Figure 10: Conceptualisation of Niyamas






WELLNESS THROUGH KILLING VITARKAS	NAME & SITUATION	CONCEPT	DESCRIPTION	MOVEMENT INFORMATION
	ROOK: RIGHT CORNER (BACK ROW)	HIRSA	TO HARM Violent believe with anyone physically, mentally as well as verbally. Results too many enemies.	ROOK: Moves to any distance vertically or horizontally
	PAWN: EXTREME RIGHT (FRONT ROW)	ASATYA	NO TRUTHFULNESS Spurious in either physically, mentally as well as verbally. Disables to know the results of actions.	PAWN: Moves to one field forward or two fields at the first move, beats diagonally to one field forward
	PAWN: LEFT TO EXTREME RIGHT (FRONT ROW)	STEYA	TO STEAL Take anything without permission of owner either physically, mentally as well as verbally. Results to lose goods/jewels.	SAME
	PAWN: SECOND LEFT TO EXTREME RIGHT (FRONT ROW)	ABRAHCHARYA	NOT TO FOLLOW BRAHMA Not to follow the instruction laid by sages either physically, mentally as well as verbally. Disables to get justice.	SAME
	PAWN: THIRD LEFT TO EXTREME RIGHT (FRONT ROW)	PARIGRAHA	TO POSSESS MORE THAN NEEDED To possess more than need either physically, mentally as well as verbally. Disables to know the purpose of life.	SAME

Figure 11: Conceptualisation of Vitarkas (Opposites of Yamas)






WELLNESS THROUGH KILLING VITARKAS	NAME & SITUATION	CONCEPT	DESCRIPTION	MOVEMENT INFORMATION
	ROOK: LEFT CORNER (BACK ROW)	ASHAUCHA	DIRTINESS No attitude of remaining clean at all levels either physically, mentally as well as verbally. Disables to get rid of attractions among others and self-body.	ROOK: Moves to any distance vertically or horizontally
	PAWN: EXTREME LEFT (FRONT ROW)	ASANTOSHIA	NO CONTENTMENT Not to attain satisfaction at all levels either physically, mentally as well as verbally. Disables to achieve supreme bliss/supremacy	PAWN: Moves to one field forward or two fields at the first move, beats diagonally to one field forward
	PAWN: RIGHT TO EXTREME LEFT (FRONT ROW)	ATAPA	NO AUSTERITY Not to work hard for achieving goal at all levels either physically, mentally and verbally. Disables to remove toxins from body	SAME
	PAWN: SECOND RIGHT TO EXTREME LEFT (FRONT ROW)	ASVADHYAYA	NOT TO STUDY SCRIPTURES OR SELF Not to learn knowledge through learning at all levels either physically, mentally as well as verbally. Disables to attain desires.	SAME
	PAWN: THIRD RIGHT TO EXTREME LEFT (FRONT ROW)	NASTIKTA	NO SURRENDER TO ALMIGHTY Not to pray, worship with full devotion at all levels either physically, mentally as well as verbally. Disables to attain liberation.	SAME

Figure 12: Conceptualisation of Vitarkas Contd. (Opposites of Niyamas)






WELLNESS THROUGH KILLING KLESHAS	NAME & POSITION	CONCEPT	DESCRIPTION	MOVEMENT INFORMATION
	QUEEN: THIRD TO EXTREME RIGHT (BACK ROW)	AVIDYA	WRONG KNOWLEDGE To visualize immortal in mortal, cleanliness in dirty and happiness in misery. Disables to attain pure knowledge.	QUEEN: Moves to any distance vertically or horizontally
	BISHOP: SECOND TO EXTREME LEFT (BACK ROW)	ASMITA	AM-NESS Ego is superseding. Self is unperceived upon something out of the seen. Disables to be polite.	BISHOP: Moves to any distance diagonally
	KNIGHT: FIRST TO EXTREME LEFT (BACK ROW)	RAGA	ATTACHMENT Attraction to pleasure giving subjects. Results of pleasure, leads to increase demands.	KNIGHT: Moves to the field two fields along the vertical and one horizontally one field vertically & two horizontally
	KNIGHT: FIRST TO EXTREME RIGHT (BACK ROW)	DWESHA	AVERSION Strong dislike, leads to misery. Results of misery, leads to increase grievance.	KNIGHT: Moves to the field two fields along the vertical and one horizontally one field vertically & two horizontally
	BISHOP: SECOND TO EXTREME RIGHT (BACK ROW)	ABHINIVESHIA	FEAR OF DEATH Will to live more and more which is common in wise also. Wishes not to die.	BISHOP: Moves to any distance diagonally

Figure 13: Conceptualisation of Kleshas







WELLNESS THROUGH SIX LIMBS	NAME & POSITION	CONCEPT	DESCRIPTION	MOVEMENT INFORMATION
	KNIGHT: FIRST TO EXTREME RIGHT (BACK ROW)	ASANA		
	BISHOP: SECOND TO EXTREME RIGHT (BACK ROW)	PRANAYAMA		
	KNIGHT: FIRST TO EXTREME LEFT (BACK ROW)	PRATYAHARA		
	BISHOP: SECOND TO EXTREME LEFT (BACK ROW)	DHARMA		
	QUEEN: FOURTH TO EXTREME RIGHT (BACK ROW)	DHYANA		
	KING: FOURTH TO EXTREME LEFT (BACK ROW)	SAMADHI		KING: Moves to one field in the vertical horizontal or diagonal

Figure 14: Conceptualisation of Six Limbs of Ashtang Yoga

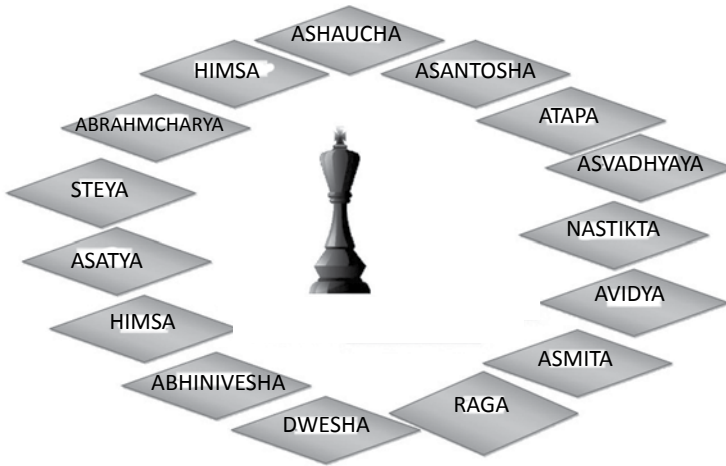


Figure 15: Kaivalya (supreme spiritual wellness encircled by Vitarkas and Kleshas)

with the help of SPSS version 25. The data collected from the sample is shown in the chart given below. The two lines correspond pre-test and post-data, respectively.

RESULTS

Tables 1 and 2 show descriptive statistics and paired sample t-test.

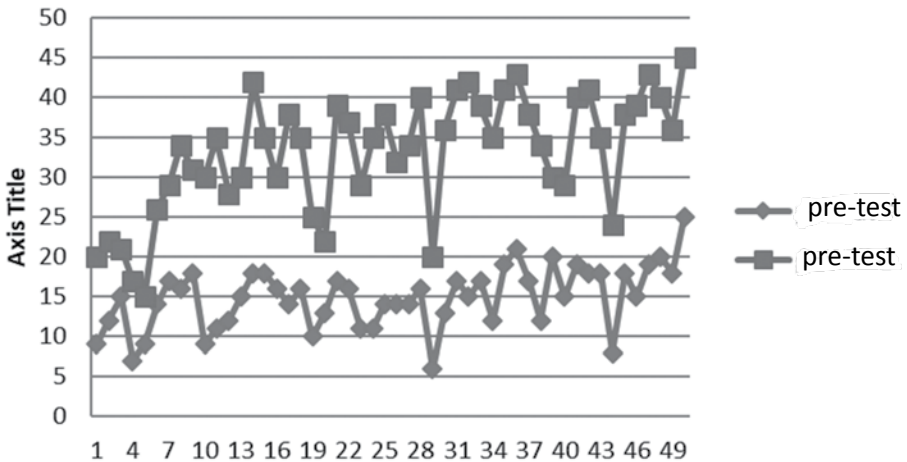


Figure 16: Pre and post-test data of scores of students

Table 1
Descriptive Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Pre-test	50	14.88	3.89	0.55
Post-test	50	33.16	7.45	1.05

Table 2
Paired sample t-test

Mean	Std. Deviation	Std. Error Mean	Lower	Upper	T	df	Sig. (two tailed)
-18.28	5.33	0.75	-19.79	-16.76	-24.25	49	<0.0001

The alpha value is found to be 0.7, which is acceptable reliability value. Tables 1 and 2 depict descriptive statistics and paired t-test values. The intervention drawn from Yogic Chess Game is found to be significant at $p < 0.0001$, for a sample size of 50 students. The calculated absolute value of the paired t-value was found to be 24.25, which is compared with table value, i.e., 3.496 at 49 degree of freedom, which was significant at $p < 0.0001$ level of significance. As the calculated value of 't' is much greater than the table value, it can be argued that the t-value in the present study is very much significant and hence the designed and developed teaching aid (Yogic Chessboard Game) can be used as an effective media to transform the concepts of ashtanga yoga among adolescent school children.

DISCUSSION

Any research work exploring *Ashtanga Yoga* philosophy on the chess board as a game for adolescents could not be traced in reviewed studies. Based on yogic education for students of Classes I to V, the textbook series, *Let us learn Yoga*

(*Aao Seekhen Yog* in Hindi) is written in multiple regional languages (Balkrishna, 2010). *Yoga: A Healthy Way of Living* for upper primary stage children has also been published by NCERT in 2015. Some studies have been traced in which *yogic* boards were developed, but that is limited to *Hatha Yoga* only. The efficacy of our study has been statistically proved and found significant in making children understand the essence of sage Patanjali's *Ashtanga Yoga* compared to others (Gardner-Anopol, 2007) (Balkrishna, 2010). Most of the reviewed studies are focused on how chess game may resolve different problems related to other subjects like maths, cognitive functions, verbal reasoning and intelligence. In our study, we tried to educate yogic concepts by using chess game. Our study may improve moral values of the society at adolescent stage of education. Thus, it may be argued

that by applying the designed Yogic Chess Game as teaching strategy, skills of learning the essence of *Ashtanga Yoga* in short span of time and essence of sage Patanjali's yoga philosophy could be learnt/disbursed in an easy and play – way manner and hence could achieve the goal of National Educational Policy (NEP), 2020. Yogic chess game may be a useful teaching tool for clarifying the *yogic* concepts. It may create curiosity among students to enter into the depth of Yoga. To understand *Ashtanga Yoga* of Patanjali, it takes one's lifetime, while in this study we attempted to teach children a fraction of the *Ashtanga Yoga Sutras* through the game. As *Ashtanga Yoga* is a vast subject, many other valuable concepts may be included in further researches. The extracts of other *yogic* scriptures can be explored also by the researchers in the same manner.

Here a simple question may arise that chess is a win/loss game and what will happen if black wins? It is hypothesised that on the Yogic chess board games, positive affects (white) or negative affects (black), may win the game. If negative affect any of two wins over side positive affect side liberation could not be achieved (which is the real victory as per *Ashtanga Yoga*). The purpose of yogic chess game is to learn deeply about the path of *Ashtanga Yoga* and the obstacles to be encountered while following it. A wrong move in chess game can lead to a chess

player at the edge of defeat. Game is just a model. In the model the forces/tools are symbolic. The purpose of teaching by yogic chess is to make the player aware of the negative forces, which are the barriers while moving towards the right path. Moreover, chess is a game of concentration of the player. Concentration/*Dharma* (sixth fold of *Ashtanga Yoga*) is again a positive force. One who is winning from the negative affect side in fact concentrated better than the player on the positive affect side. So winning or losing depends upon the player's concentration. In the ancient scripture *Mahabharata*, it is described that Yudhistara lost and Shakuni won the *Chausar* game, but it is also true that the battlefield of *Mahabharata* was conquered by Pandavas. Thus in both situations, either winning or losing may illuminate the player's mind.

CONCLUSION

The objective of the study is to design and develop yogic chess board game for a basic understanding of Patanjali's *Ashtanga Yoga* philosophy for adolescents and test its efficacy. An innovative 'Yogic chess board game'. To test the efficacy of the developed yogic chess board game has been designed and developed in this study, selected 50 children (26 boys and 24 girls) were selected and found to have significant benefits at $p < 0.0001$. It has also been found that the results of our study are more advantageous. It may be concluded that the designed 'yogic chess board game may improve

and inculcate the skills of *Ashtanga Yoga* in a short span of time and the essence of sage *Patanjali's yoga* philosophy could be disbursed in an easy and play way manner and hence could improve moral values of the society. This study may enable students to become curious to learn more about yoga in a practical and friendly way. Hence, it may be used as a media to inculcate yogic principles in children in adolescence. It may be concluded that by teaching yoga with the help of yogic chess board game may be helpful in achieving the goal of NEP 2020.

IMPLICATIONS OF THE STUDY

The educational policymakers and administrators may popularise this

yogic chess board game by making it a part of syllabi/curriculum so that children may be benefitted. This game could be used as a tool by secondary and senior secondary school teachers, yoga teachers, physical training instructors (PTIs) and yoga educators to teach the essence of yoga at adolescence stage of schooling. Future research may be carried out for developing *Ashtanga Yoga Chess* game as mobile applications. This pilot study may be helpful for further research across various schools and may also enable the policymakers to replicate.

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