

Development of Nutrition Intervention Program for Male Rifle Shooters of Age Group 20-25 Years

Mayura Anand Joshi
Department of Foods, Nutrition and Dietetics
College of Home Science, Nirmala Niketan
(Affiliated to the University of Mumbai)
49, New Marine Lines,
Mumbai- 400020

Vibha Hasija
Department of Foods, Nutrition and Dietetics
College of Home Science, Nirmala Niketan
(Affiliated to the University of Mumbai)
49, New Marine Lines,
Mumbai-400020

Abstract:- Optimum diet, nutrition, mental training and sports psychology play an important role in our model wherein these qualities are very essential for a shooter. In this study the nutritional knowledge, attitude and practices, concentration, focus and overall mental health which affects the performance of well-established professional shooters and upcoming professional shooters, was studied and a nutrition intervention program was developed for upcoming male professional rifle shooters of age group 20 to 25 years, to overcome the dietary lacunas faced by them. Salient results included a lacunae of knowledge, attitude and practices with regard to daily consumption of fruits, components of diet which influence cognitive function, importance of hydration and specific event meals consumption, foods to be restricted, vitamins and minerals supplementations and importance of mental health. It can be concluded that there is a requirement for nutrition intervention in the profession of shooting and a great amount of work can be done in this particular area.

Keywords:- Rifle Shooting, Mental Health, Focus, Concentration, Nutrition Intervention, Blogs, Nutritional Knowledge, Pre Event Meals, Post Event Meals, During Event Meals.

I. INTRODUCTION

Shooting is a sport which signifies accuracy, control, precision, proficiency and speed of the shooter in aiming at target using weapons like pistols, air guns, firearms, shotguns, bows or crossbows.

Mental training and sports psychology are very much essential in achieving good shooting results is very strongly believed by most shooting coaches. (Ahsan, M., & Mohammad, A., 2017). Balanced diet & nutrition along with nutrients play an important role in our model of thinking, cognition, memory, capacity and emotions. Many researches have shown that food might affect the chemical composition of brain, thus changing the mood.(Huang, Q., Liu, H., Suzuki, K., Ma, S., & Liu, C., 2019).

In this rapidly changing global scenario and technical developments, drastic changes in learning process and strategy are the need of the hour. Digital devices mainly act as an aid to encourage the learner's interest. There is a wide

variety of audio-visual aids a speaker needs while teaching. The benefits of digital tools are convenient, comprehensible, wide access of digital resources, sharing, and publishing of plenty of information, easy translation, convenient for visually impaired, accurate and up-to-date information, cheaper and easier for publication, maintenance etc. (B. Senthil Kumar, D. Nivedhitha, M.R Chitra Mai, Ayem Perumal, 2016).

Webinars have played crucial role in education. (Swati Mittal, 2020). Nowadays, PowerPoint is an educational tool for teaching and conveying information in class. It was mainly established for presentation and not essentially for teaching and learning in a classroom. Its applications in teaching and learning settings should deliver better means of communicating information to the students. PowerPoint can develop teaching sessions by providing a roadmap, reinforcing what you said and allowing you to use graphics and other audio-visual aid to clarify understanding and to support different learning styles. (Hashemi, Masoud & Azizinezhad, Masoud & Farokhi, Masoumeh, 2012). Blog, as a mode for non-interactive nutrition intervention program can be a most convenient method. When blogs are successfully integrated as learning-cognitive tools within the teaching and learning process, they have a significant role and promote the achievement of specific learning objectives. Blogs also encourage the development of higher-order thinking skills and progress flexibility in teaching and learning. (Nisiforou, Efi & Etekleous, Nikleia, 2014). Videos and short format videos can be used for diversifying the learning process, students have more opportunities to absorb the course content. Info graphics include both text and images to convey a complex idea in a creative, easy-to-understand way. Images have a unique way of capturing viewers' attention that text may not always attain. People pay more attention towards information rich images on a website and readers spend more time looking at those images than reading text on the same page.

Therefore, the interactive and non-interactive digital nutrition intervention program was developed for the shooters to make them understand the importance of nutrition & mental health and foods which are essential for cognition.

II. MATERIALS AND METHODS

This research conducted was of descriptive study design. Purposive sampling technique was used for data collection from upcoming professional shooters with a sample size of 31. A survey was conducted for upcoming professional rifle shooters as well as well-established professional rifle shooters, in which they were interviewed, regarding their mental health and nutrition using a self-developed questionnaire. From the survey conducted, the lacunas regarding nutrition was observed and it was decided to develop a nutrition intervention program, through the modes of the below mentioned specific tools which were used to educate the upcoming professional shooters, well established professional shooters were excluded from this study. Intervention program was conducted in two ways which are interactive nutrition intervention program and non-interactive nutrition intervention program. Different topics were explained through various tools under each platform and these platforms are explained below.

A. Interactive Session

Medium used was Webinar, topic covered in the webinar was awareness regarding the co-relation between mental health and nutrition. In this webinar, brain health was explained briefly, which included mechanisms related to neurons and neurotransmitters and the linkage of digestive system with brain, was explained. Shooters were made aware of the importance of adequate daily consumption of calories, proteins and iron. Nutrients and the nutritional requirements for a shooter, importance of pre, during and post event meals and nutrition during travel was also included in the webinar.

Tool used was Power point presentation. Recording link of webinar is <https://nutrifedfables.blogspot.com/2021/06/recording-of-webinar.html>

B. Non Interactive Session

Non interactive intervention program was carried out through blogs. A blog was created in which various nutrition topics were covered in association with cognition through videos, info graphics, posters, brochures and article.

Medium used was Blogs under the brand name-“Nutrified Fables”. The below mentioned education tools were developed for blogs-

- Tool used was article in which the points covered were, general information regarding the sport of shooting and the importance of mental health and nutrition in shooting. This article was posted to make the shooters eager to know more about nutrition and cognition. The article was named “Shoot with your mind”. Link for the article <https://nutrifedfables.blogspot.com/2021/04/shoot-with-your-mind.html>
- Video was the tool used. Point covered in this video was basic awareness regarding the right food choices video was under the name “Food that soothes you!”. Link for the video <https://nutrifedfables.blogspot.com/2021/04/blog-post.html>

- Tool used was Info graphic. Below mentioned are the info-graphics which were created.
 - a) Point covered in the first info graphic was on Sugars, in which the importance of glucose for the brain was stated and the type of sugars which should be avoided & included in the diet, mentioned in association with its effect on cognition. Link for info graphics <https://nutrifedfables.blogspot.com/2021/04/all-about-sugar.html>
 - b) Second info-graphic was named as “Choose from good fat” and posted to provide information regarding the fats which are good for overall health. Link for info graphic is <https://nutrifedfables.blogspot.com/2021/04/choose-from-good-fats.html>
 - c) The next info graphic named “Iron for Cognition” contained information regarding foods rich in iron which should be included in diet and the effect of iron on cognition. Link for info graphic https://nutrifedfables.blogspot.com/2021/04/blog-post_30.html
 - d) Importance of Omega 3 Fatty Acids and rich sources of Omega 3 Fatty Acids was mentioned in this info-graphic named “Omega 3 Fatty Acids and mental health”. Link for this info graphics <https://nutrifedfables.blogspot.com/2021/04/omega-3-fatty-acid-mental-health.html>
 - e) In this info graphic named “Get your dose of hormones”, all the essential hormones for brain health are mentioned and ways to enhance the secretion of the hormones are given. Link to access this info graphic is <https://nutrifedfables.blogspot.com/2021/04/get-your-dose-of-hormones.html>
- Tool used was Poster. Below mentioned are the posters which were created.
 - a) Poster named “Fat that is bad” was posted to create awareness regarding the saturated fats and its effect on health and cognition. Link for this poster is <https://nutrifedfables.blogspot.com/2021/04/fat-that-is-bad.html>
 - b) In this poster, methods to manage your mental health is briefly mentioned through diet, exercise, sleep and various coping skills and it is named as “Managing your Mental Health”. Link for this poster is <https://nutrifedfables.blogspot.com/2021/04/managing-your-mental-health.html>
- Tool used was Animated Brochure and in this, the knowledge regarding antioxidants vitamins such as vitamin A, C & E and its relation with cognition was included. Also Vitamin A for eye health is mentioned in this brochure. Link for this is <https://nutrifedfables.blogspot.com/2021/04/antioxidants-and-cognition.html>

III. RESULTS

A. The following things which were administered post intervention program are mentioned below -

The upcoming rising state in supporting elite athlete mental health and welfare has focused mostly on building mental health literacy or awareness of the signs of mental ill-health amongst athletes. Such awareness is necessary, but not adequate to address the diverse mental health needs of elite athletes. (Purcell, R., Gwyther, K., & Rice, S. M., 2019). Post the nutrition intervention program, almost all the shooters agreed to the fact than mental health is more essential than physical health in shooting.

Cognitive functions are influenced by components of the diet. Antioxidants (vitamins C, E, A, zinc, selenium) have a very important role in the protection against oxidative stress connected with mental deterioration and in the improvement of cognition. Presently, there is a high consumption of diets rich in saturated fats and refined sugars and low intake of fruits, vegetables and water that can negatively affect cognition. Adequate nutrition is essential to enhance brain function and prevent cognitive decline. (Martínez García, et.al, 2018). The nutrition intervention program was a success as very few shooters disagreed and more number of shooters agreed to the fact that specific food items are necessary to be consumed to maintain mental balance.

Fruits and fruit juice were widely used for cognition and brain health. In the post intervention program shooters realised the importance of consuming fruits daily.

Pre, during and post competition meals are very essential in any sport. In case of a competitive athlete, the requirement changes as per the need of the event. The competing demands, before an event or practice session can be a challenge for optimal performance (Christopher R. Mohr., 2019). After the intervention program, shooters felt the necessity of consuming pre, post and during competition meals.

Hydration approaches play a key role in enhancing the performance and safety of athletes during sporting activities. Clinicians, coaches, players, team managers, etc. should be aware of the many physiological, behavioural, logistical and psychological problems that regulate both the athlete's fluid needs during sport and his/her opportunity to address them; these are often precise to the environment, the event and the individual athlete.(Belval, L. N, et.al, 2019). Nutrition intervention program was a success as shooters realised the importance of hydration for the event.

The interesting evidences have been discovered about effect of dietary factors on certain molecular systems and mechanisms that take care of mental activity. Thus, a combination of nutrition and exercise is suggested to elevate these probable ill health outcomes. (Keservani, R. K., Sharma, A. K., & Kesharwani, R. K., 2016). Post the intervention program, shooters felt the necessity to restrict sugar, junk food and spicy foods, as these foods may create a barrier in their performance.

Vitamins and minerals are necessary in the body for many metabolic processes and are important in supporting growth and development. Vitamins and minerals also are vital in abundant reactions involved with exercise and physical activity, including energy, carbohydrate, fat and protein

uptake, oxygen transfer and delivery, and tissue repair (Volpe S. L., 2007). In the intervention program these points were addressed so after the nutrition intervention program nearly all the shooters felt that it is essential to consume iron supplements.

Diet and nutrition are not only critical for humans and their body composition, but also have major effects on mood and mental welfare. While the responsible factors of mental health are compound, increasing evidence specifies a strong association between a poor diet and the exacerbation of mood disorders, including anxiety and depression.(Adan, R, et.al, 2019). Post the intervention program shooters felt the need of consuming omega 3 fatty acids to stay mentally fit.

B. Feedback given by the upcoming shooters regarding the nutrition intervention program-

- 1) Feedback regarding the content of the seminar was asked for from the upcoming professional shooters, wherein 68% of the shooters said the seminar was excellent, while 22% said it to be good and 10% said that it could have done better.
- 2) Almost all the shooters felt that the seminar was useful, wherein 71% of the shooters said the seminar was excellent, while 19% said it to be good and 10% said that it was poor.
- 3) The upcoming professional shooters were asked regarding the practical applicability of information provided in the seminar, wherein 97% shooters said yes and 3% shooter said no. Also all the shooters felt the need to know the information provided (Refer fig.1).

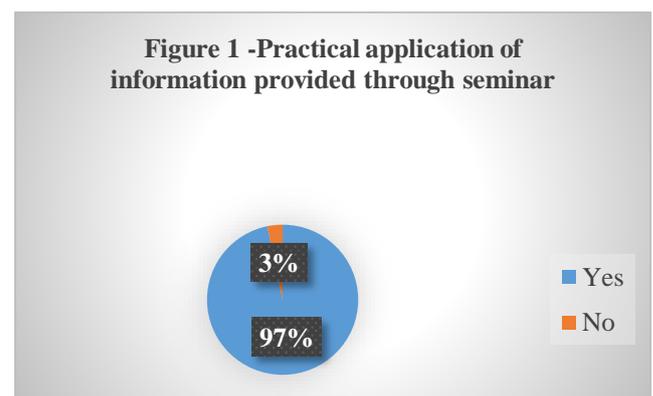


Figure 1 -Practical application of information provided through seminar

- 4) The upcoming professional shooters were asked to give a feedback regarding the usefulness of the content of posters, info graphics, brochure and article was asked for wherein 58% of the shooters said the seminar was excellent, while 29% said it to be good, 3% said it could have done better and 10% said that it was poor.
- 5) The upcoming professional shooters were asked if the information provided through the posters, info graphics, brochure and article was sufficient, where 58% of the shooters said the seminar was excellent, while 39% said it to be good and 3% said it could have done better.
- 6) Feedback regarding the presentation of information provided through posters, info graphics, brochure and article was asked for from the upcoming professional

shooters, in which 52% of the shooters said the seminar was excellent, while 45% said it to be good and 3% said it could have done better.

- 7) Post intervention, all the shooters felt the need to know the information and will be practically applying the information provided through the posters, info graphics, brochure and articles.
- 8) When the upcoming professional shooters were asked regarding the usefulness of the content provided through videos, 58% of the shooters said the seminar was excellent, while 39% said it to be good and 3% said it could have done better.
- 9) Feedback regarding the sufficiency of information provided through videos was asked for from the upcoming professional shooters, wherein 45% of the shooters said the seminar was excellent, while 45% said it to be good and 10% said it could have done better (Refer fig.2).

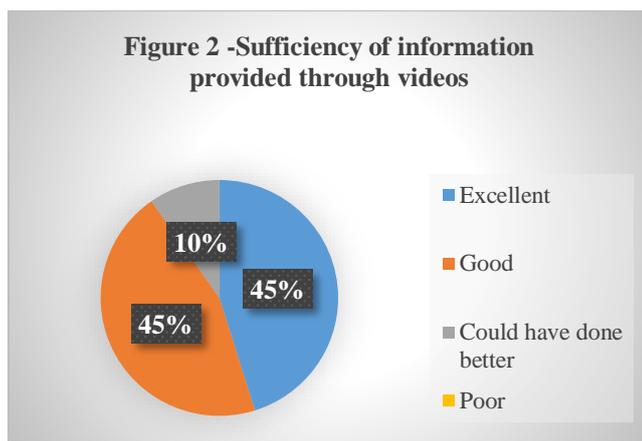


Figure 2 - Sufficiency of information provided through videos

- 10) All the upcoming professional shooters will be practically applying the information provided through the videos and they felt the need to know the information

IV. DISCUSSION

Mental training and sports psychology are very much essential in achieving good shooting results is very strongly believed by most shooting coaches. The sentence, “shooting is 90 percent mental and 10 percent physical” is said to be an exaggeration but it emphasize the importance of mental training in shooting sport. (Gary Anderson, 2011). In every sport various factors are required to perform well. These factors could be skill, technical and tactical strategies, physical fitness, functioning of organs and psychological wellbeing. (Ahsan, M., & Mohammad, A., 2017). Balanced diet & nutrition along with nutrients play an important role in our model of thinking, cognition, memory, capacity and emotions. Many researches have shown that food might affect the chemical composition of brain, thus changing the mood. (Huang, Q., Liu, H., Suzuki, K., Ma, S., & Liu, C., et.al, 2019). Shooting is an event which comes under the category of skilled activity along with archery and equestrian. (National Institute of Nutrition, 2007). Standing position rifle Shooters use special jackets to support them while performing. (Jay Lokegaonkar, 2019). The weight of the rifle is below 5.5 kg (12.12 lbs.). (National rifle association of

America, 2015). Hence, to hold the rifle for a prolonged period of time depending on the type of event, strength is needed and daily adequate nutrients are required to fulfil those demands. The National Institute of Nutrition, has stated the Energy Allowance Recommendations for Shooters in 2007 which states that 60kg is the average body weight and 50kcal per kilogram per day is recommended which equals to 3000kcal per day. (National Institute of Nutrition, 2007). Chess is also a sport which can be classified into the same category as that of shooting, archery, etc. and is considered a very demanding sport which not only requires physical wellbeing but also mental fitness. (Roberto H. Baglione, 2007). A game like chess where a high level of cognition is necessary, fatigue may set in due to certain factors which include inadequate rest the night before the tournament, not getting breaks between rounds, improper diet and lengthy rounds that may drain the brain and body, all these factors may result in decreased mental alertness. (Kay Umeakunne, 2004)

Similarly there are many such studies related to the game like chess where cognition plays an essential role but there are no such studies on shooters mental performance and nutrition for shooters, which will eventually improve the performance of rifle shooters. Therefore, developing a nutrition intervention program for rifle shooters is the finest way to educate them as it will be easily accessible and sustainable since the rifle shooters are spread across the country, and as of yet the nutrition education is not yet initiated in the country in the event of rifle shooting. Nutrition Intervention program, which is done digitally will be the appropriate way for remote teaching through interactive live webinars and non-interactive mode which is by posting articles, info-graphics, videos, posters on blogs. There are many blogs created digitally for the event of chess like “chessessentials.com, chess.com, the chess mind blog, etc.”, wherein different aspects of chess are studied but there is lacunae of digital mode of intervention in the event of rifle shooting where specifically nutrition and cognition are studied.

So this proposed model, with a very small pilot study could be taken ahead for rifle shooters and soon a protocol can be established for professional and upcoming rifle shooters where the dietary analysis will be done and diet will be suggested by considering the aspects as strength, adequate daily dietary requirement, and cognitive health and for improving the performance.

V. CONCLUSION

Globally there are very few articles stating the importance of cognition and its relation with the nutrition in the event of rifle shooting. The new digital technologies have primarily changed the way of teaching and learning and it could be an easy tool for accessibility. The four extents such as flexibility, interactivity, connectivity and integration of multiple media which, differentiate digital platform from previous information technologies. Thus, digital tools improve the communication process in the teaching- learning process. Hence, this study is proposed.

REFERENCES

- [1]. Ahsan, M., & Mohammad, A. (2017). Mental toughness as a determinant factor of performance in table tennis. *European Journal of Physical Education and Sport Science*.
- [2]. Huang, Q., Liu, H., Suzuki, K., Ma, S., & Liu, C. (2019). Linking What We Eat to Our Mood: A Review of Diet, Dietary Antioxidants, and Depression. *Antioxidants (Basel, Switzerland)*, 8(9), 376. <https://doi.org/10.3390/antiox8090376>
- [3]. B. Senthil Kumar, D. Nivedhitha, M.R Chitra Mai, Ayem Perumal, DIGITAL TOOLS FOR EFFECTIVE LEARNING, Volume-3, Issue-11, Nov,2016. Researcher, Indian Institute of Industry Interaction Education & Research, India, Associate Professor & Head, Dept, of Mass Communication, Pondicherry , Research Scholar, VBSPU, India, Quality Control Manager, NSH, Kuwait. <https://www.irjet.net/archives/V3/i11/IRJET-V3I1168.pdf>
- [4]. SWATI MITTAL, JUN 1, 2020. What is webinar and how is it good for education? <https://www.jagranjosh.com/articles/what-is-webinar-and-how-is-it-good-for-education-15056571581#:~:text=The%20webinar%20allows%20or%20better,a%20classroom%20full%20of%20students>
- [5]. Hashemi, Masoud & Azizinezhad, Masoud & Farokhi, Masoumeh. (2012). Power point as an innovative tool for teaching and learning in modern classes. *Procedia - social and behavioral sciences*. 31. 10.1016/j.sbspro.2011.12.103.
- [6]. Nisiforou, Efi & Eteokleous, Nikleia. (2014). The Role of Blogging in a Changing Society: Theory, Practice and Implications. 10.4018/978-1-4666-5990-2.ch014.
- [7]. Purcell, R., Gwyther, K., & Rice, S. M. (2019). Mental Health In Elite Athletes: Increased Awareness Requires An Early Intervention Framework to Respond to Athlete Needs. *Sports medicine - open*, 5(1), 46. <https://doi.org/10.1186/s40798-019-0220-1>
- [8]. Martínez García, R. M., Jiménez Ortega, A. I., López Sobaler, A. M., & Ortega, R. M. (2018). Estrategias nutricionales que mejoran la función cognitiva [Nutrition strategies that improve cognitive function]. *Nutricion hospitalaria*, 35(Spec No6), 16–19. <https://doi.org/10.20960/nh.2281>
- [9]. Christopher R. Mohr, PhD, RD.(September 10, 2019). Timing Your Pre- and Post-Workout Nutrition. <https://www.eatright.org/fitness/exercise/exercise-nutrition/timing-your-pre-and-post-workout-nutrition>
- [10]. Belval, L. N., Hosokawa, Y., Casa, D. J., Adams, W. M., Armstrong, L. E., Baker, L. B., Burke, L., Cheuvront, S., Chiampas, G., González-Alonso, J., Huggins, R. A., Kavouras, S. A., Lee, E. C., McDermott, B. P., Miller, K., Schlader, Z., Sims, S., Stearns, R. L., Troyanos, C., & Wingo, J. (2019). Practical Hydration Solutions for Sports. *Nutrients*, 11(7), 1550. <https://doi.org/10.3390/nu11071550>
- [11]. Keservani, R. K., Sharma, A. K., & Kesharwani, R. K. (2016). Medicinal Effect of Nutraceutical Fruits for the Cognition and Brain Health. *Scientifica*, 2016, 3109254. <https://doi.org/10.1155/2016/3109254>
- [12]. Volpe S. L. (2007). Micronutrient requirements for athletes. *Clinics in sports medicine*, 26(1), 119–130. <https://doi.org/10.1016/j.csm.2006.11.009>
- [13]. Adan, R., van der Beek, E. M., Buitelaar, J. K., Cryan, J. F., Hebebrand, J., Higgs, S., Schellekens, H., & Dickson, S. L. (2019). Nutritional psychiatry: Towards improving mental health by what you eat. *European neuropsychopharmacology : the journal of the European College of Neuropsychopharmacology*, 29(12), 1321–1332.
- [14]. Gary Anderson. (2011) MENTAL PERFORMANCE AND SPORTS PSYCHOLOGY--TEACHING THE FIRST STEPS, pp 6-9. http://thecmp.org/wp-content/uploads/Gary_OTMWinter2011.pdf
- [15]. Jay Lokegaonkar(6 November 2019)Shooting at the Olympics: A guide for Indian fans <https://www.olympicchannel.com/en/stories/news/detail/india-olympic-shooting-rules-history/>
- [16]. National Institute of Nutrition. Nutrition and Hydration Guidelines for Excellence in Sports Performance, 2007 http://ilsi-india.org/PDF/Nutrition_&_Hyd_Guidelines_for_Athletes_Final_report.pdf
- [17]. NATIONAL RIFLE ASSOCIATION OF AMERICA, JANUARY 2015 <https://competitions.nra.org/documents/pdf/compete/RuleBooks/PAR/par-book.pdf>
- [18]. Kay Umeakunne (2004) What's Eating Your Game? https://www.thechessdrum.net/newsbriefs/2004/NB_documents/ChessDiet.pdf
- [19]. Roberto H. Baglione,(2007)Nutritional Practices of Chess Grandmasters <https://en.chessbase.com/post/chess-and-nutrition-how-to-feed-a-chess-grandmaster#:~:text=During%20the%20games%2C%20it%20is,cereal%20cookies%2C%20can%20be%20chosen>.