

Title - The impact of regular participation in martial arts training on psychological wellbeing, behaviour and cognition in young people, a systematic review.

Abstract

Background

The purpose of this systematic review is to investigate the various factors associated with martial arts i.e. a sport that is traditional Japanese or Chinese form of fighting or defending yourself (e.g. Judo, Karate, Brazilian jiu-jitsu) and their role in improving **cognition** (attention/ memory, processing speed, executive thinking), psychological eudemonic and hedonic **wellbeing** (Quality of life, wellbeing, mental health, happiness, autonomy), and **behaviour**, (self-regulation, aggression, emotions, thoughts, self-control and achievement) in young people.

Findings

This review will include interventions studies, observation studies, cross sectional studies pre and post comparison studies which include martial arts, and its impact on the health and wellbeing in young people. This includes: (1) interventions reviewing the positive impacts of martial arts on psychological wellbeing; improvement of cognition in young people; (3) the impact of regular martial arts training affect or influence self-motivation, achievement and behaviour in young people. We will include intervention studies, observation studies, cross sectional studies pre and post comparison studies which include martial arts, and the health and wellbeing in young people.

Discussion

This systematic review will provide evidence on the benefits of regular martial arts training and their role in improving cognition (attention/ memory, processing speed, executive thinking) and psychological wellbeing (Quality of life, wellbeing, mental health, happiness, autonomy), behaviour, (self-regulation, aggression, emotions, thoughts, self-control and achievement) in young people. This will guide future work on intervention development and primary research in this field.

Background

The purpose of this systematic review is to investigate the various factors associated with martial arts i.e. a sport that is traditional Japanese or Chinese form of fighting or defending yourself (e.g. Judo, Karate, Brazilian jiu-jitsu). Mixed martial arts (MMA), hybrid combat sport incorporating techniques from Muay Thai (Thai boxing), boxing, wrestling, judo, jujitsu, karate and other disciplines. A recent study highlights the potential implications for parents interested in enrolling their children in MMA which shows the positive impact on youth (Beesley & Thomas, 2019).

The popularity of mixed martial arts over the 25 years has significantly increased and the benefits have been advertised by various outlets without any substantiation despite clear changes to behaviour, cognition and psychological development, what constitutes and facilitates mental health or psychological well-being has remained of great interest to martial artists and philosophers alike, and still endures to this day (Croom, 2014).

There is substantial evidence that training in martial arts is associated with improvement in cognitive function, psychological well-being and behaviour development in adults (Deci, 1991). The research carried out in 2017 showed that the well-being of adolescents who engaged in Asian martial arts have different dimensions or adolescents have various fundamental needs and the different components of the training help adolescents meet their fundamental needs, thereby improving adolescents' well-being (Tadesee, 2017).

The effects of regular practice of martial arts is considered controversial and studies in this field limited their attention to singular psychological benefits (Kirk, 2020). With an increasing rise in mental health and behaviour issues amongst adolescents (Brand, 2019), the benefits of martial arts may help prevent and build positive psychological and cognitive function in young people.

“Hard” martial arts seem to have potential to improve balance and cognitive functions that decline with age, which can lead to poorer health outcomes among the elderly (e.g. cognitive decline, falls and fractures) (Barnett, 2018). A study in 2017 revealed the features and manifestations of structural components (cognitive, motivational and emotional) and levels of development (high, medium, low) of the

behavioural self-regulation of adolescents in the process of mastering martial arts (Galan, 2017). An article in 2019 contributes to the literature by reviewing recent work on psychological well-being and martial arts to determine whether there is substantive support for the claim that practicing martial arts can positively contribute to one flourishing with greater psychological well-being (Croom, 2014).

It must also be noted that specific martial arts such as Shotokan karate and Brazilian Jiu Jitsu involves individuals of all ages from different backgrounds but this link between cognitive ability and extensive training at a particular grade has not been studied in great depth. Mickelsson (2020) compares more traditional martial arts vs MMA in young people with regards to the development of young people. Early findings suggest that more traditional martial arts and sports may be effective in reducing antisocial behaviour while enhancing socially desirable behaviour among young people. This systematic review will assess the impact of martial arts on cognition, psychological function and behaviour in young people.

The aim of this study is to review the application of various martial arts and their role in improving cognition (attention/ memory, processing speed, executive thinking) and psychological eudemonic and hedonic wellbeing (Quality of life, wellbeing, mental health, happiness, autonomy), behaviour, (self-regulation, aggression, emotions, thoughts, self-control and achievement) in young people.

Objectives

To determine the impact of regular martial arts training on psychological wellbeing in young people.

To establish if regular martial arts training can influence cognition in young people.

To establish a relationship between martial arts training and better psychological wellbeing and cognition.

To determine the affect of regular martial arts training on self-motivation, achievement and behaviour in young people.

Methods and Design

Review of inclusion criteria

We will include intervention studies, observation studies, cross sectional studies, pre and post comparison studies, which include martial arts, and the health and wellbeing in young people. The target group will be adolescents, both male and female who participate in martial arts and sport respectively. The initial data extraction will focus on titles and abstracts of studies retrieved using the search strategy and those from additional sources will be screened independently by two review authors to identify studies that potentially meet the inclusion criteria.

The full text of eligible studies will be retrieved and independently assessed for eligibility by the same two review team members. Any disagreement between them over the eligibility of studies will be resolved through discussion with third reviewer. The data extraction will be completed by one reviewer and checked for consistency by a second reviewer. The following information will be extracted for from included studies.

- Study characteristics: author/ year of publication, study population (e.g. sample size, age and sex).
- Experimental conditions: description of study design (intervention, comparators).
- Study Outcomes and results: (methods, time points of measurements, results for primary outcomes).
- Recommendations??

Type of Martial Arts

For the purpose of the this review, martial arts codified systems and traditions of combat practiced for a number of reasons such as self-defence; military and law enforcement applications; competition; physical, mental, and spiritual development; entertainment; and the preservation of a nation's intangible cultural heritage. We will therefore include interventions using: judo, hapkido, muay thai, jeet kune, kenpo, wrestling, tai chi, jiu-jitsu, tae kwon do, capoeira, aikido, gongfu, gong fu, karate, jujitsu, wushu and hap ki do.

Search Terminology

We will search the following bibliographic databases: PubMed, Medline, PsychInfo, Web of Science, SportDiscus, Scopus, Campbell and Cochrane. The search strategy will only include terms relating to, or describing martial arts studies and young people.

Initial key words to be used cognition/ psychological wellbeing, behaviour, motivation, achievement, martial arts training and young people.

Studies published between January 1990 to 2021 and the date the search is run will be sought. The search will rerun just before the final analysis and further studies retrieved for inclusion. The reference list of all identified articles will be searched for additional studies.

Types of Intervention

Interventions must aim to improve health or psychological wellbeing through regular participation in martial arts. This includes: (1) interventions reviewing the positive impacts of martial arts on psychological wellbeing: psychological eudemonic and hedonic wellbeing (Quality of life, wellbeing, mental health, happiness, autonomy); (2) the impact of regular martial arts training affect or influence behaviour, (self-regulation, aggression, emotions, thoughts, self-control and achievement); (3) interventions showing the impacts of martial arts on cognition (attention/ memory, processing speed, executive thinking). We will therefore include:

- Regular martial arts training and how it improves psychological wellbeing (Quality of life, wellbeing, mental health, happiness, autonomy) in young people
- Regular martial arts training improve cognition (attention/ memory, processing speed, executive thinking) in young people.
- The relationship between martial arts training and better psychological wellbeing and cognition.
- That regular martial arts training influences self-regulation, aggression, emotions, thoughts, self-control and achievement and behaviour in young people.

Types of Participants

Inclusion criteria will include young people aged 5-18 years who engage in martial arts training, to include those who are new to training, only train once per week and those who train more regularly (a minimum training of twice a week), both males and females. Exclusion criteria will include anyone over the age of 18 years will be excluded. Interventions studies will be included where martial arts were employed as a part of an intervention to access wellbeing, behaviour and cognitive function in young people. Studies that have assessed wellbeing, behaviour and cognitive function in young people exposed to martial arts will also be included.

Literature search

We will use a three-part search strategy to identify studies meeting the inclusion criteria above that have been published since January 1990: (1) we will search electronic bibliographic databases for published work, using a comprehensive search strategy for martial arts, psychological wellbeing and cognition(2) we will search trial registers for ongoing and recently completed trials; (3) we will search the reference lists of primary studies included in the review and the reference lists of relevant, previously published reviews.

Electronic bibliographic databases

We will search the following bibliographic databases: PubMed, Medline, PsychInfo, Web of Science, SportDiscus, Scopus, Campbell and Cochrane. The search strategy will only include terms relating to, or describing martial arts studies and young people.

The search strategy will include only key words relating to or describing cognition/ psychological wellbeing, behaviour, motivation, achievement, martial arts training and young people. These search terms will be adapted for use with other bibliographic databases in combination with database-specific filters for controlled trials, where these are available. Reviews will be primarily in English. The searches will be re-run immediately prior to analysis and further studies retrieved for inclusion, to ensure that the most current information is presented in the review. We will include data from dissertations that meet the inclusion criteria, where these are

indexed in the above databases and retrieved in our search. We will not be retrieving or including any unpublished data.

Study Screening and Selection

There will be no restriction on the types of study design included. We will include intervention studies, observation studies, cross sectional studies pre and post comparison studies which include martial arts, and the health and wellbeing in young people. Titles and abstracts of studies retrieved using the search strategy and those from additional sources will be screened independently by two review authors to identify studies that potentially meet the inclusion criteria outlined above. The full text of these potentially eligible studies will be retrieved and independently assessed for eligibility by two review authors. Any disagreement between the two review authors over the eligibility of particular studies will be resolved through discussion with a third review author.

Data Extraction

A standardised, pre-piloted form will be used to extract data from the included studies for assessment of study quality and evidence synthesis. Extracted information will include: study setting (including country); study population and participant demographics and baseline characteristics; martial arts ; details of the intervention and control conditions; study methodology; recruitment and study completion rates; outcomes and times of measurement; indicators of acceptability to users; suggested mechanisms of intervention action; information for assessment of the risk of bias. Two review authors will independently extract data, discrepancies will be identified and resolved through discussion (with a third author if required). Missing data will be requested from study authors via email.

Assessing the risk of bias

Risk of bias will be assessed based on the Critical Appraisal Skills Programmes (CASP). CASP will be used to appraise the strengths and limitations of each qualitative study. One reviewer will assess the quality of each study in the review. The full text of eligible studies will be retrieved and independently assessed for eligibility by the same two review team members. Any disagreement between them over the eligibility of studies will be resolved through discussion with third reviewer. Any disagreements will be resolved with a third reviewer.

Methods by which qualitative data is obtained. Data will be reviewed by secondary and tertiary sources.

Disagreements between the review authors over the risk of bias in particular studies will be resolved by discussion, with involvement of a third review author where necessary. The level of risk of bias in each of these domains will be presented separately for each study in tables in the final review publication.

Analysis

Descriptive analysis

We will provide a narrative synthesis of the findings from the included studies. We will structure the narrative synthesis by describing the studies according to the following characteristics:

- The type of intervention
- The type of martial art
- Impact on cognition, behaviour and psychological function
- The target population characteristics e.g. age, gender.
- The type of outcome
- Intervention content – features of the martial arts being studied, intervention components etc.

Conclusion

This systematic review of martial arts and other sports interventions will provide a detailed summary of the evidence for the impact of martial arts and sports on cognition, behaviour and psychological development in young people.

References

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