

Scientific studies on Krav Maga: state of the art

Abstract

This study aimed to analyze and synthesize the main concepts about Krav Maga in the last four decades. This is a review of the academic literature with a qualitative approach and a narrative nature. The searched databases are PubMed/Medline, Scopus, Web of Science, SciELO, Index Medicus, Capes Platform, ProQuest Digital Dissertations, Brazilian Digital Library of Theses and Dissertations (BDTD) and Google Scholar, between the years 1982 and 2022. Empirical studies with cross-sectional, longitudinal, case, control and randomized design were included, and books and private websites were excluded. The textual corpus was processed by the IRaMuTeQ software. Forty-four studies met the eligibility criteria, of which eighteen conceptualized Krav Maga as “self-defense”, twelve as “fighting”, seven as “hand-to-hand combat”, four as “self-defense art”, three as “cultural heritage” and immaterial” and another as a “hybrid system”. The main aspects evoked and addressed in the research were: Operational and Military, Historical, Pedagogical, Psychosocial and Physiological. Most studies had low to moderate methodological quality, indicating the need for greater control of biases in future research. In addition, it was evidenced that Krav Maga is a system, or method developed for self-defense, however, it is a polysemic term, and cannot be understood in a uniform and linear way.

Keywords: Krav Maga, martial art, contact combat, self-defense, narrative review

Volume 7 Issue 4 - 2023

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Received: June 24, 2023 | **Published:** July 06, 2023

Introduction

In the last four decades, a considerable amount of information has been produced in different countries about “Krav Maga” (KM), broadly translated from Hebrew (contact combat or hand-to-hand combat), one of the disciplines or methods of fighting with origins attributed to the State of Israel.¹⁻³

Despite this academic awakening, the findings seem to indicate a conceptual paradox, mainly regarding its origin, development, globalization, methodological evolution and its applications. This contradiction ends up creating conceptual myths, according to Mor,¹ pointing to the need for further investigations and syntheses that facilitate its understanding, allowing conclusions based on the combination of reliable results, from the multiple sources and available understandings.³

As a discipline, system or fighting method, Krav Maga, by itself, is a phenomenon that is difficult to analyze, as it should not be understood in a linear and uniform way. It is a fight in its broadest sense, a method of corporal exercise for self-defense, developed with technical bases in other modalities, with formative and ideological characteristics that evoke firmness and continuity and advocate the survival of a nation.^{4,5}

On the other hand, seeing beyond just a physical fighting practice, focused on self-defense, Krav Maga can assume and contribute to other functions in society. In this sense, it is imperative to list lines of study that indicate its use in other environments and areas of knowledge, such as the human, social, biological and health sciences.

In fact, due to its more classical application for self-defense, a greater amount of research in this regard is notorious. On the other hand, there is a significant shortage of works exploring its possible educational potential in formal and non-formal teaching environments, its psychosocial contributions, applications in safety and personal protection, and those that associate it with training and physical performance, promoting health and quality of life.⁵

Considering the aforementioned, using the qualitative textual analysis tool of the IRaMuTeQ software, this work aims to present

the state of the art of scientific production on Krav Maga in the world, in the last 40 years [1982 to 2022], analyzing and synthesizing the themes studied.

Academic research on Krav Maga

In general, until 2018, no accurate analyses were found on the academic production related to Krav Maga.¹ However, parallel to this period, it is possible to verify numerous events and non-scientific publications that sought to promote and disseminate it. There are numerous newspaper clippings, private books, blogs, websites, workshops, seminars, courses, field training, excursions, and even extension courses, held by representative entities around the world.^{1,4-6}

The first attempt to know chronologically the emergence and evolution of Krav Maga as a body training method, quantifying the scientific production and relating it to the physiological effects produced by its practice, was idealized by Andrade Neto.⁵ The study conducted a bibliometric review of publications about KM in the main free-access academic research platforms in Brazil, in the period from 2008 to 2018. This study, which was, until then, the first work about the theme, listed 357 documents with the term “Krav Maga”, being categorized 21 scientific articles with different approaches and only 7 related to the theme physical training.⁷

The results obtained in this study pointed to a low and almost non-existent number of scientific articles directed to Krav Maga activities as a habitual body practice or as a physical training method. Among these, most were related to activities developed in military organizations and security agencies, with specific teaching methodology for each country or tactical group.⁸⁻¹³

Thus, contrary to other modalities of fighting and martial arts, which have adopted strategies to promote technical and scientific events, aiming to discuss the praxis of the modalities scientifically,⁵ Krav Maga, despite its increasing popularization and vertiginous growth,^{1,2} seems to opt for the adoption of non-academic events of practical nature, restricted to entities, federations, confederations, and representative groups, as a form of marketing insertion and dissemination, making it difficult and minimizing its understanding.

Material and methods

This research is a part of a doctoral thesis developed by the Graduate Program in Health Sciences Applied to the Locomotor System of the Medicine College of Ribeirão Preto, University of São Paulo/USP. This was a review study with a qualitative approach, with a narrative nature of the academic literature, which, according Thomas et al.¹⁴ aims to describe the consensus on the concept of Krav Maga, whose registration was made in the Ethics and Research Committee of the School of Physical Education and Sport of Ribeirão Preto, at the University of São Paulo/USP, CAAE: 40025420.7.0000.5659, with opinion number 4.579.829 in 2021.

The search for documents occurred in November and December 2022, considering the papers published between January 1982 and December 2022. The databases used were PubMed/Medline, Scopus, Web of Science SciELO, Index Medicus, Plataforma Capes, ProQuest Digital Dissertations, Brazilian Digital Library of Theses and Dissertations (BDTD), and Google Scholar. The descriptors used for the search were “Krav Maga”, “Martial Art”, “Self Defense” and “Hand-to-hand combat”, chosen based on the review by Andrade et al.,⁷ and other studies that use similar descriptors, with no language restrictions.

After the initial search, duplicate studies were excluded, and then an initial analysis of the abstracts was performed, excluding those with incomplete information that did not meet the eligibility criteria, such as: newspaper articles, private books, blogs, websites, or any publication of a private nature. We also included:

- Empirical research with transversal, longitudinal case, control and randomized designs, as well as review studies related to the theme;
- Studies published in English, German, Polish, Russian and Portuguese;
- Theses, dissertations and final papers of undergraduate courses already published and available on these platforms.

In the first stage of the search, 1,123 potential documents were found, which, after exclusion of duplicate and non-academic works, left 169 articles for analysis of the abstracts. Of these, 21 articles were excluded that involved subjects and variables that were not related to the research topic, leaving a total of 65 references that met the established inclusion and exclusion criteria, which were read in full, and, of these, 44 were eligible, making up the text corpus of the present review, for preparation and analysis in IRaMuTeQ. The steps of the article selection process are shown in Figure 1.

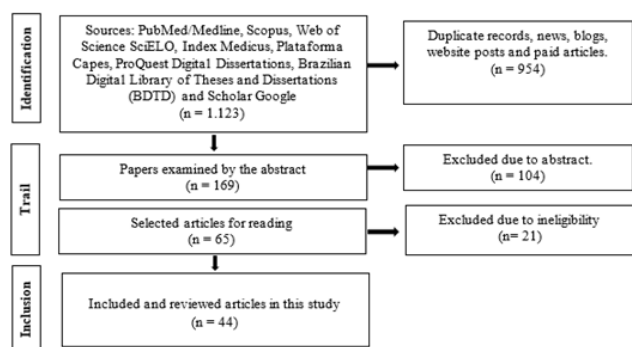


Figure 1 Stage of the article selection process.

Source: own elaboration, Prisma Flowchart model.

After organizing the textual corpus, containing the thematic variables (title, abstract, development, methodology, analysis, results and conclusion) in Microsoft Word 365®, the file was then revised, corrected, exported and saved with character encoding in standard UTF-8 (Unicode Transformation Format 8 bit codeunits), being submitted to the IRaMuTeQ software, version 0.7 alpha 2-2020 for Microsoft Windows, an open source computational program (free), developed by the French researcher Ratinaud e Marchan¹⁵ and anchored in the statistical software R and in the computational language Python. IRaMuTeQ is a support tool for qualitative scientific research, which enables the organization of a large volume of textual data, management and statistical treatment of texts, interviews or open questionnaires, optimizing the time of textual analysis.¹⁶

Papers examined by the abstract (n = 169)

Therefore, five textual analyses of the corpus were contemplated (n=44):

- Classic lexicographic analyses to verify the statistics of the number of text segments (TS), evocations and forms;
- Word Cloud, in order to group and organize graphically words according to their relevance;
- Similitude Analysis, to analyse existing links between words, deducing their elaboration and structure;
- Descending Hierarchical Classification (DHC) to obtain the text segment classes that, at the same time, presented similar vocabulary among themselves, and different vocabulary from the text segments of the other classes; and
- Factorial Correspondence Analysis (FCA) to verify possible dependence and independence associations between each intermediate category, between articles of different authors and countries, depending on the variables collected.¹⁵⁻¹⁷

Results and discussion

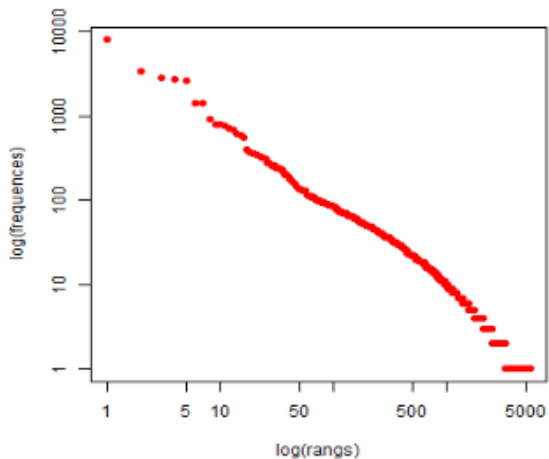
Based on the information collected, it was possible to identify the studies in the theme related to the object of research. Thus, the bibliographic survey aimed to present the state of the art of scientific production on Krav Maga in the world, in the last 40 years (1982 to 2022).

The general corpus analyzed was composed of (n = 44) scientific articles, distributed in fifteen countries as follows: 18 from Brazil, 6 from Germany, 5 from Israel, 2 from the United States of America, 2 from Holland, 2 from Croatia, and, 1 article each, from England, Norway, Canada, Poland, Serbia, China, Ukraine, Portugal and Spain. All texts were translated into Portuguese to equalize the analyses. The presentation in the charts and graphs below will be maintained in this language to minimize loss of structure and lexical context.

After completing the first analysis, the textual corpus was divided into 2,251 text segments (TS), with use of 1,938 ST (86.10%), which is considered excellent for this type of analysis^{17,18} occurrences emerged (words, forms or words), 5,386 of which were lemmatized; of which, 4,791 active forms, 576 supplementary forms and 2,080 words with a single occurrence (titled hapax), as shown in Graph 1.

According to the curve in the Zipf Graph 1, the words in the corpus have an approximately uniform distribution, in terms of active and supplementary forms. In the first case of the supplementary forms, there are at least 6 words that are repeated more than 1,000 times in the corpus, reaching a word with almost 10,000 appearances. In the

second case, active forms together with supplementary ones, there are more than 500 words that are repeated between 10 and 1,000 times in the corpus. Hapaxes, words that appear only once, also follow a coherent distribution pattern, representing almost 3% of lemmatized words in the corpus.



Graph 1 Zipf's curve.

Source: IRaMuTeQ software.

In the next step, Word Cloud was used as a resource to highlight the main words of the corpus, making it possible to identify the grouping of words in an organized and structured way, allowing the visualization that some of these words are presented with different sizes. This is so because the understanding of the general organization of words that are repeated more frequently allows a better understanding of the context of the authors' conceptions on the subject.¹⁷

For a better visualization, the number of words in the cloud was reduced, to words with a minimum frequency of 66, resulting in Figure 2 below, with the 81 main words (in Portuguese) that appeared in the corpus.



Figure 2 Reduced Word Cloud, containing the most frequent terms in the analysed corpus.

Source: LIRaMuTeQ software.

This way, the 7 (seven) active words that appeared the most were Krav Maga (801 times), followed by training (373 times), combat (350 times), physical (317 times), body (281 times), fight (277 times) and technique (258 times). It is clear, therefore, that these most frequent words represent, in a first interpretation, the positioning and understanding of the authors about the concept of Krav Maga.

However, it is important to note that, in the word cloud, the terms are randomly distributed, without being able to establish any correlation between them, in addition to the difference in size, which is proportional to the frequency of appearance in the corpus.

Next, the Similitude Analysis was performed based on graph theory. This method is considered a field of mathematics that investigates the associations between the objects of a defined set, helping in the specification, understanding of the connection between the terms, allowing to differentiate the common segments, as well as the particularities of the investigated corpus, according to the illustrative variables (descriptive) identified in the analysis.¹⁵

Thus, using the same 81 words prioritized in the previous word cloud, IRaMuTeQ provided a graph that represents the structure of the content analysis. When analyzing this result, it is possible to identify a link between the linguistic forms of the set of texts, referring to the way in which the content Figure 3 Similitude Analysis Chart is structured.

Based on Figure 3, it is possible to observe that the word Krav Maga is the key expression that connects all themes. In this orange central nucleus, the terms technique, modality, Israel, Imi Lichtenfeld, method, practical, fight and system, among other words, still compete with greater weight. Connected to this core, there is a community in yellow with the word combat in the center and its connections. Just above a green nucleus emerges with the word training and physical in the center with its correlated words. There are also three more nucleus with the words personal defense, self-defense and martial art.

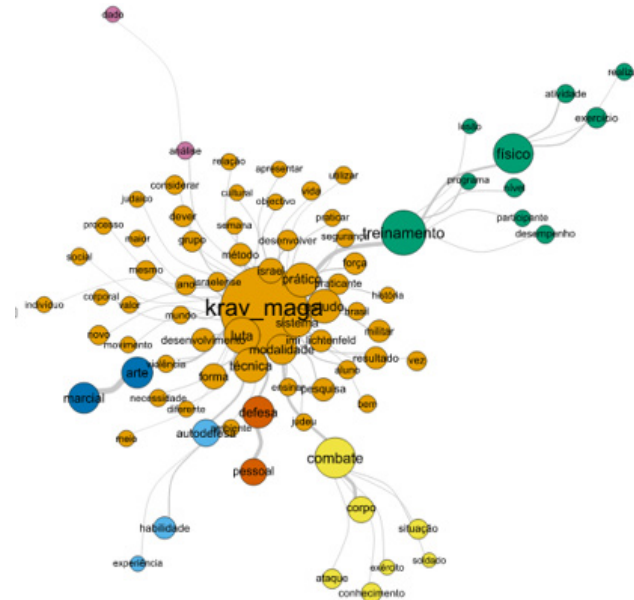


Figure 3 presents the similitude analysis for the analyzed textual corpus.

Source: IRaMuteQ software.

Furthermore, by analyzing the image clockwise (the vertices connecting the words with greater thickness), it is possible to identify that the expression “Physical Training” emerges from the branching

of the words Israel, practice and safety; from the words modality, teaching and Jew, the expression “Hand-to-Hand Combat” emerges; from the words fight, modality and technique emerges “Personal Defense”; from the words fight and technique comes “Self-Defense”, and, finally, from the words fight, development and violence comes “Martial Art”. This means that these five expressions are very close to the conceptual conceptions of the authors about Krav Maga.

In the fourth step, Reinert’s method was applied, which built the Descending Hierarchical Classification (CHD). This method verifies the correlation between terms, within the same text segment, that make up the textual corpus, allowing one to go beyond the quantification of lexicons, passing to an association with the context.¹⁷

For the construction of CHD, the program created a dictionary of words, using the chi-square test (χ^2), which indicates the degree

or strength of association between words and their respective class. This degree or associative strength was explored when the test value was greater than 11.61, which represents a value of $p < 0.0001$. This value means that, being $p < 0.05$, the results are considered statistically significant.^{18,19}

In Figure 4 below, called “dendrogram of classes”, it is observed that 5 classes were generated, initially, united in the corpus. This corpus then went through the first partitioning process, in which its text segments were split between class 5 and another cluster. This group, in turn, is divided into class 1 and another. This, in turn, is divided into class 4 and another. The latter has its text segments then divided, between class 2 and class 3, when the process is interrupted, as new stable classes are no longer produced from the subdivisions of these two.



Figure 4 Dendrogram of classes.

IDF – Israel Defense Forces; f -Frequency; χ^2 – chi - squared;; Kapap – fight attributed to Israel; CMB – Military College of Brasília; VLDL -Very Low Density Lipoprotein.

Source: author.

This way, it was possible to consider, in addition to the number of classes ($n = 5$), the percentage participation of each one of them in the total texts, the largest being Class 4, “Operational and Military Aspects”, with 525 ST (27, 09%), followed by Class 1, “Historical Aspects”, with 523 ST (26.99%), Class 2, “Pedagogical Aspects”, with 438 ST (22.60%), Class 3, “Psychosocial Aspects”, with 227 ST (11.71%) and Class 5, “Physiological Aspects”, with 225 ST (11.61%). Next, these classes will be explained individually in the order in which they are presented in Figure 4 (dendrogram of classes), that is, from top to bottom and from left to right.

Class 1: Historical aspects

Class 1 was named so because it evokes ways that portray the different understandings of the authors about the historical context,

evolution and globalization of Krav Maga, highlighting the words Israel, Imi Lichtenfeld, Jew, Jewish people, 19th century, Israeli, IDF, instructor, Krav Maga, 40’s, identity, civil, history, Palestine, war, Kapap, Hagana, heritage and cultural.

These evocations are represented in the utterances of 523 ST (26.99%) of the articles, emphasizing that Krav Maga is a fighting discipline idealized for self-defense, directly linked to the historical, political and social processes that led to the formation of the State of Israel,²⁰ whose sociocultural tendencies of the Jewish people naturally found a way to establish the nation,²¹ reinforcing the Israeli identity as a people.²²

They also reinforce that its idealization and subsequent globalization were only possible thanks to the efforts of some

precursors such as Moshe Feldenkrais, Gershon Kofler, Yehuda Marcus and Charles Wingate, who, influenced by nationalist sentiment, dedicated themselves to the development of physical capacities and combat skills, necessary and emerging to self-defense, promoting its accessibility to practitioners in different countries.^{1,3,4}

This process reached its peak after the technical and methodological systematization and media representations

promoted by Mr. Imi Lichtenfeld and some of his senior students.^{2,23,24} Some of these promotions advertised the modality with stereotypes of the muscular Jew, the exceptionality of the Israeli people, an invincible army and as a model of courage and a continuous source of hope for the world Jewish community.^{2,6}

In this way, there seems to be a tendency of the authors of this class, pointing to the understanding of Krav Maga as a method or discipline of self-defense, and should not be seen as a new phenomenon or the exclusive creation of a single person, but, rather, being born and evolving of an emerging need for protection and defense of a social group, its territory and its culture (Jewish settlers). Thanks to its simplicity and applicability, it has become one of the most popular forms of self-defense in the world.

Class 4: Pedagogical aspects

In this class, a representativeness of the modality's applications was perceived, brought by the context of its teaching in a school environment, notably in Brazil, which can be confirmed by the 438 ST (22.60%) of the forms that emerged with more vigor in this class the words practice, modality, health, CMB, physical and activity.

The word "practice" shows that in the texts investigated, the authors highlight the implementation of didactic-pedagogical practices, experimental practices, practices of physical and interactive activities, among others, permeating "beyond struggle" or "self-defense". In addition, the texts also show a strong indication of the contributions of this orientation to the formation of the subject with full capacity to exercise their citizenship.²⁵

Among the objectives of the regular practice of Krav Maga in a school environment, the search for better health, quality of life and sociocultural interaction stood out.²⁵ And even though its application in a school environment was able to promote a better perception of identity marks and the deconstruction of prejudices and stereotypes of violent practices, leading to critical reflection on body practices influenced by the media and their consumption.^{5,25}

Class 4 also highlights the terms scientific, data, school, social, teaching, student, guardian, college, struggle, content, sports, education, class and interest, characterizing that the authors' orientation is strongly present in investigations that seek to understand the activities and conceptions of students, professors and professors in the area of educational praxis.

It should be noted that Krav Maga, in the formal teaching context, is not only configured through the practice of fighting, it can involve the human being in an integral way, considering all its forms of expression for the construction of self-defense, including the ideologies, values, responsibilities, among others.²⁵ It also expresses conceptions related to a way of giving meaning to existence through body practice, enhancing self-knowledge and understanding about oneself and the world.²⁶ This finding, according to Andrade Neto,³ is due to the multiplicity of exercises and the varied proposed training protocols, which encourage their adherence and social insertion.

Class 3: Psychosocial aspects

Class 3 was named so for having evidenced 227 ST (11.71%) of the highlighted words a correspondence between social relations and the application of the values adopted in the practice of Krav Maga. Words such as skill, self-defense, leader, expert, competence, employee, communication, learning, development, decision making, leadership, self-regulation, courage, terrorism, capacity, goal, environment, pain, tactical, and coaching highlight connections between the values adopted in the physical and tactical skills of this self-defense system and the characteristics of leadership competencies, necessary for the development of a team.²⁷

In the contextualization of this class, it can be evidenced that the additional skills acquired from the physical practice of Krav Maga led to changes and development of the primary and necessary skills for leadership training in the modern corporate environment,²⁸ stimulating better decision-making in the corporate and social environment²⁹ and perceptual-cognitive. For example, in a simulated training for the identification of multiple aggressors, rapid and almost immediate decision-making is encouraged by the instructor, which is essential in the corporate environment.³⁰

On the other hand, they also express that, through specific skills of this self-defense system, it is possible to develop character traits, skills, and associated values such as physical integrity and ethics, so important in modernity.³¹ The expertise and the mastery of self-defense techniques, acquired in the informal learning environment, have been shown to be related to the development of leadership skills.³²

Class 2: Operational and military aspects

Class 2 was defined so based on the words technique, attack, soldier, combat, situation, body, opponent, rule, learn, weapon, street, threat, safety, injury, real, combatant, aggressor, crisis, hand and confront, demonstrating that the investigations about the applicability of Krav Maga in operational environments, tactical teams, police and military represent the majority of the researches nowadays, which is proven in the 525 TS (27,09%) of evocations. In this class, information about the most varied forms of employment of self-defense and combat techniques, developed in various countries around the world, are highlighted.

Considered as crucial for the survival of the Jewish settlers, due to the constant uprisings, these hand-to-hand combat techniques were developed concomitant to the basic military physical preparation.²¹ In classes or instructions, the fighters/students were prepared technically, physically, and mentally to be able to control their body and mind to react to multiple attacks.³³

This way, the self-defense system was created to cater in an individualized way to the formation of individual militaries, tactical teams, and groups, assigning techniques and tactics for forest, desert, urban area, and vip protection environments.^{11-13,34,35} This understanding suggests that for a soldier to be effective in hand-to-hand combat, he must train techniques based on gross motor skills, increasing his chances of acquiring a new technique as quickly as possible.^{9,36}

By adding characteristics of simplicity in the execution of movements, Krav Maga encourages faster learning, which enhances its objectivity and applicability in situations of risk and crisis,⁵ which seems to lead several training centers and military academies from different countries around the world to test and adopt its methodology.^{8-12,23,26-28}

Class 5: Physiological aspects

In relation to class 5, called Physiological Aspects, words like 16 weeks, beginner group, veteran group, test, glucose, volunteer, sleep, body composition, VLDL, cortisol, statistics, evaluation, cholesterol, fat, muscle mass, triglycerides, fasting, metabolic, hydration, and hormonal are highlighted. The incidence of these terms totaled 225 TS (11.61%) of the evocations, demonstrating that the research related to the physiological effects of Krav Maga training and its consequences, although still timid, are a trend in the academic environment, especially regarding the concern with health and quality of life of its practitioners.^{37,38}

Notably in Brazil, as already evidenced in Class 4 - Pedagogical Aspects, it was verified a higher incidence of publications on the theme. And, also, it was the country responsible for the first investigations related to the physical training of Krav Maga as a fighting modality, from the research on the “Physiological Effects of Physical Training of Krav Maga on Hemodynamic, Metabolic, Hydration, Neuromuscular, Hormonal and Sleep Variables”.⁵

This research that constitutes, until then, the most detailed one about the theme, was carried out in the period from April to August 2019, with the participation of 30 men (15 beginners and 15 veterans), aged between 18 and 60 years old, male, young adults, submitted to a specific physical training protocol of Krav Maga, lasting 16 weeks, resulting in varied and important publications that sought to trace a physiological profile of the practitioners. Overall, it was found that the applied training protocol caused significant physiological changes in all variables researched.⁵

The most prominent physiological variables were the reduction in anxiety levels and improvement in sleep quality,³⁹ the promotion of changes in fasting glucose and post-training glucose, as well as VLDL, decreasing the rates of total cholesterol and triglycerides, improving the lipoprotein profile, induction of increased secretion of cortisol, stimulating the removal of lactate.^{5,39}

The research also allowed the knowledge of the characteristics and objectives for its practice, which have attracted the higher economic classes of Brazilian society, as the physical training program applied proved to be attractive, relating the motivation for its practice directly with the psychological security and with the survival instinct.⁴⁰ It also caused an increase in upper limb strength; total free strength; and increased muscular endurance, especially among veterans.⁴¹

Other correlated benefits were the reduction of fat percentage and body mass index (BMI) and waist-to-hip ratio (WHR) measures, modifying the aspects of body composition,⁴² and drawing attention to the prescription of activities and physical training protocols for the modality, alerting to the need for physical evaluations before, during and after training protocols, for a better analysis and follow-up of its practitioners.^{43,44}

Previous studies by Putnam⁴⁵ had investigated the relative exercise intensity and energy expenditure of a single session of Krav Maga training. The findings demonstrated that a workout of intensity ranging from moderate to vigorous is a viable option for individuals seeking alternatives to traditional aerobic training programs. Already Di Bacco et al.⁴⁶ meanwhile, investigated the acquisition, retention, and further improvement in training of two Krav Maga striking techniques among novice practitioners: a direct punch and defensive kick. And

found that a single training session could be sufficient to learn and retain Krav Maga striking techniques relatively permanently.

In view of the information provided by this class, it is noticeable a growing concern of the scientific community regarding the understanding of the physiological effects of physical training and regular practice of this modality for the promotion of health and quality of life.

Seeking to deepen the understanding about the formation of classes, the continuity of the process was done through the Correspondence Factor Analysis (AFC). Figure 5 (below) shows the AFC of the information referring to the reduced forms and the arrangement of the classes in the respective quadrants that made it possible to verify the associations of dependence and independence between each intermediate category.

The Cartesian plane allows visualizing the level of independence through the distances or proximities between the variables. Therefore, dependency associations occur in two situations: i) categories in the same quadrant; and ii) categories near rows/columns. On the other hand, independence correspondences occur when the categories are in different quadrants, as shown in Figure 5 below.

The Cartesian plane (Figure 5) above corresponds to the FCA of the words that evoked and composed each of the five intermediate classes. By reading the highlighted words and their insertion in the text segments, it was possible to ratify the evocations of the CHD mentioned above, regarding the conceptual classes and tendencies of Krav Maga.

In Class 1, in (Q3), the relevance of the studies about the historical aspects and its evolution as a self-defense method was made explicit. Class 2, in (Q2), corroborated the understanding of the multiple applicability of Krav Maga in security forces and tactical teams, also clarifying its significance for the consolidation as a method or discipline of hand-to-hand combat. Class 3, educational aspects, interconnects with Class 2 also in (Q2), showing greater alignment with the ideas of teaching and learning, demonstrating the growing educational bias, as well as the importance of its understanding beyond fighting. And, finally, Class 5, in (Q4), physiological aspects, ends up complementing the previous ones, for treating Krav Maga as a measurable fighting body practice, capable of promoting health and quality of life of its adepts.

Thus, from the results presented in this study, it is possible to infer the urgent need for expansion and diversification in the production of academic knowledge related to Krav Maga, because, specifically about its conceptualization, it has not yet been possible to reach a common denominator, which can trigger contradictions. In the five lexical classes found, the concepts are divided into multiple aspects, from which we highlight the historical, cultural, political, economic, social, physiological, and educational ones.

Most studies had low to moderate methodological quality, indicating the need for greater control of biases in future research. However, it was possible to observe a conceptual similarity intertwined in the oral and empirical history of contemporary society, highlighting the effects of globalized communication and market-oriented issues, interfering in this understanding.

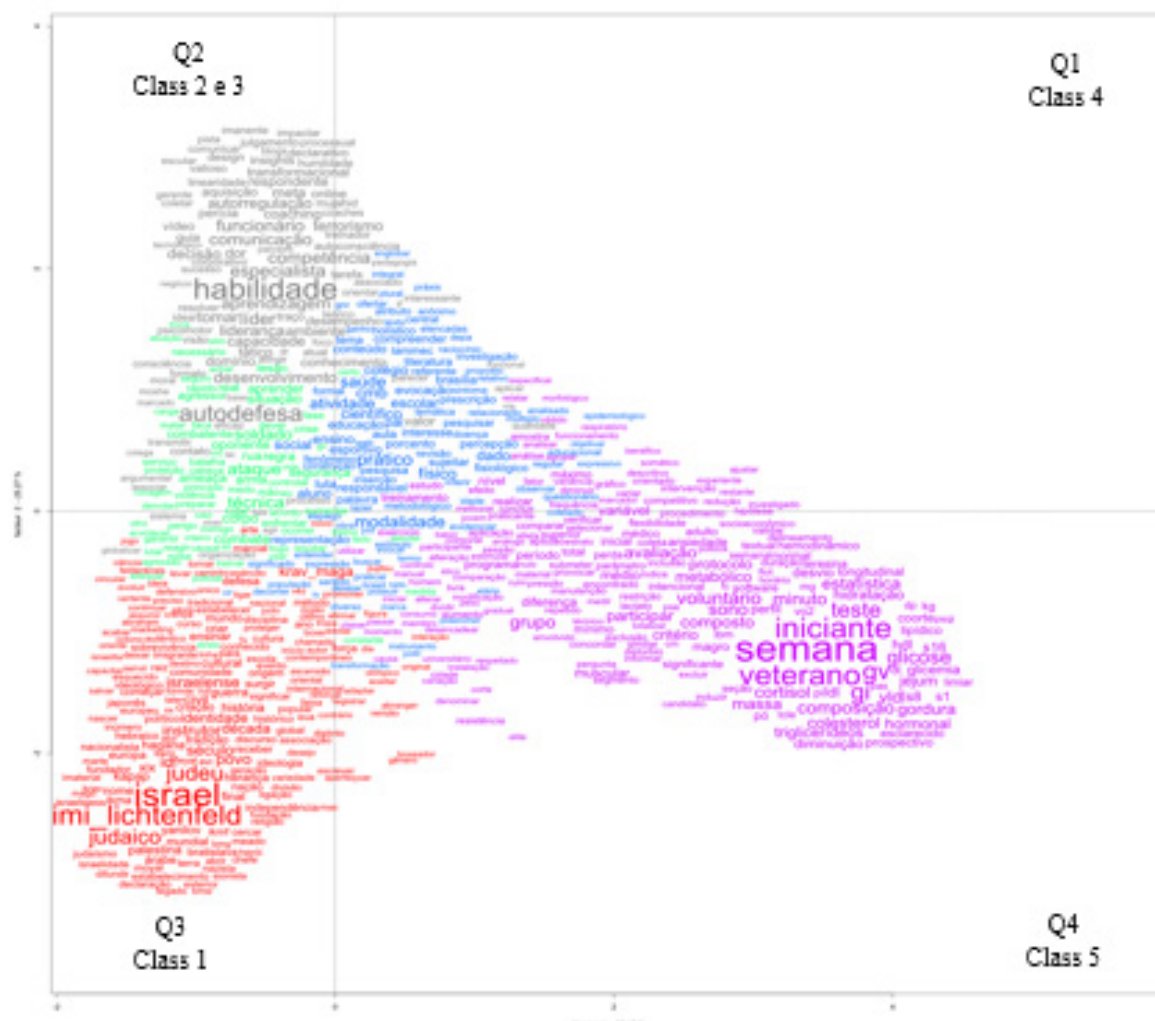


Figure 5 Factorial Correspondence Analysis (FCA) – Reduced forms – of the words of each category protected by Q (quadrant).

Source: IRaMuteQ software.

This way, it is safe to infer that the definitions with the highest degree of similarity tended toward the concepts of self-defense, fighting, hand-to-hand combat, and self-defense art. In the bias of a method originally aimed at “self-defense”, a considerable number of authors (n = 18) define it as such.^{2,6,8–12,21,22,27–30,32,47–50}

Addressing Krav Maga as a “fighting” method (n = 12), and, as such, an organized and systematized process of physical and psychological improvement, in its morphological and functional aspects, impacting directly on the ability to perform tasks that involve psychomotor demands, whether they are sports or not, the following stood out^{3,26,39,40–46,51,52}

In the context of Krav Maga as “hand-to-hand combat” (n = 7) for issues of personal and collective defense and safety, this group of authors^{8,9,11,13,29,49,53}

Another group defined it as a method for “Self Defense Art” (n = 4), highlighting^{23,24,36,50} for its application and personal protection, in academies and training centers with militarized culture. And also,

individualized conceptions emerged and distinct from the others (n = 3), relating it to the Cultural and Immaterial Heritage of Israel^{1,20,21} and, finally, as a hybrid system.¹²

Overall, any attempt to come up with a definitive concept for the term Krav Maga is still quite restrictive in terms of publications, especially after the analyses presented here. In its history, martial arts and fighting, the conceptualization that has most informed the authors’ understanding of Krav Maga, have always served to defend a social group, its territory, and its culture.

In other contexts, they have served purposes not always praiseworthy to invade a certain region and subjugate the population that lived there. Finally, they have always been directly linked to military issues.⁵⁴

This conceptual ambiguity is defined by Wetzler⁵⁵ as theoretical and terminological pitfalls, as most researchers assign to the understanding of “martial arts” the various skills or practices that originated as combat methods, including many performance, religious, or health

promotion activities that no longer have direct combat applications, but clearly originate in combat.

For the author, what makes something a martial art, rather than an action done by someone who is naturally good at fighting, is the fact that these techniques can be taught. Without the transmission of these skills through teaching, they do not constitute an 'art' in the sense of being a body of information or techniques that aim to reproduce certain knowledge or effects.

Thus, analyzing the common aspects evoked in this research, it is possible to verify some dimensions that can help define or equalize the term Krav Maga, which, even if not uniformly and linearly, is a popular Hebrew term that refers to fighting in its broad sense, a method of bodily exercise for self-defense.

It was created as a response to violent conflicts, having origins in competitive sports, making the technical improvement necessary for a better performance, with connections that transcend the simple act of fighting, providing an improvement in health and quality of life.

This way, based on the available literature and considering the contemporaneity of its appearance, it is possible to assure that Krav Maga is a fighting method developed in the State of Israel exclusively for personal defense, using other modalities of fighting and pre-existing martial arts.

Conclusion

In this manuscript, we discussed the researches that bring in their core the main concepts about Krav Maga, published in the last four decades in Brazil and worldwide, available in the main research platforms. The fact of having worked with representative concepts provided a simultaneous quantitative and qualitative view of the works, allowing the identification of some characteristics of the researches focused on the theme. Thus, the examination carried out in this review allows us to make important considerations that will enable the reader to glimpse indications for future studies in the area.

Regarding the quantity of documents found ($n = 1,123$), it was evidenced that the theme is still elucidated in a non-academic way. However, a greater scientific inclination has been noted in the last few years, of which the ($n = 169$) pre-analyzed pointed out a significant growth, especially in Brazil in the last five years. Nevertheless, of the ($n = 44$) analyzed, the methodological quality was shown to be low to moderate, which calls for greater control of bias in future researches.

Based on the analyses of the contents of this review, it was found that Krav Maga is a polysemic term, which can produce, depending on its use, several understandings, which divide the concepts into multiple aspects, highlighting the historical, cultural, political, economic, social, physiological and educational ones. In general, the concept most often evoked among researchers was that of "self-defense".

Although the researches that deal with the historical, operational, and military aspects have been the most frequent, there is a growing variety of other themes reported in the literature, which approach from pedagogical, psychosocial, and physiological aspects, relating the practice of Krav Maga to a possible strategy of educational praxis and health promotion. Therefore, it is believed that the discussions presented about the possibilities of its use as a systematized teaching tool in formal educational settings can leverage greater interest and holistic understanding of its applicability.

In this way, based on the available literature and considering the textual analysis studied here, it is possible to assure that Krav Maga is a fighting method, created by the Jewish people in the XIX century, based on other modalities of fighting and pre-existing martial arts, aiming to guarantee the survival and independence of the State of Israel. As a teaching discipline, it evolved methodologically, adapting itself to modern operational needs, and became a method focused exclusively on self-defense.

Indeed, the considerations presented in this manuscript are aimed more at opening to new analyses than to definitive conclusions. The mapping of the academic production related to a certain theme and/or from a certain source represents a valuable contribution by allowing the visualization of characteristics of the state of knowledge on the studied theme, identifying positive points and weaknesses to be faced.

Finally, it is suggested a critical and attentive look at the articulation between the theme of martial arts and the Krav Maga method of self-defense, so that we can unambiguously produce a bigger and richer didactic-methodological framework rooted in the scientific evidence presented here. Thus, in a rhetorical way, we advise a critical-dialogical approach and educational praxis from the academic and professional point of view by the multiple agents of knowledge that dynamize and reconfigure the body and movement manifestations, more specifically those related to the teaching of Krav Maga.

Acknowledgments

To the Command of the Military School of Brasília for the unconditional support to the development of this research.

Conflict of interest

The authors declare that there is no conflict of interest.

Funding

There were no external funding sources for this study.

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