

## Diabetes Crossword Puzzle Game

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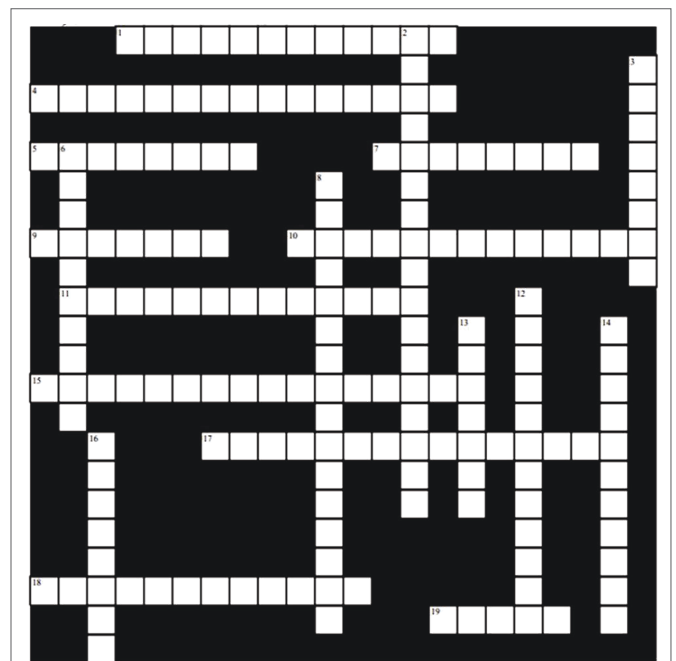
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Diabetes Mellitus (DM) is one of the major public health global problems and traditional methods used in diabetes education such as lectures, seminars, textbooks, problem-solving, and workshops using content that involves health promotion and prevention of DM; do not always motivate patients or health professions [1]. On the other hand, educational games are important in the development of intelligence and sociability. In this sense, the educational game is not a current phenomenon in the teaching-learning process, but it is an innovative strategy little used in diabetes education.

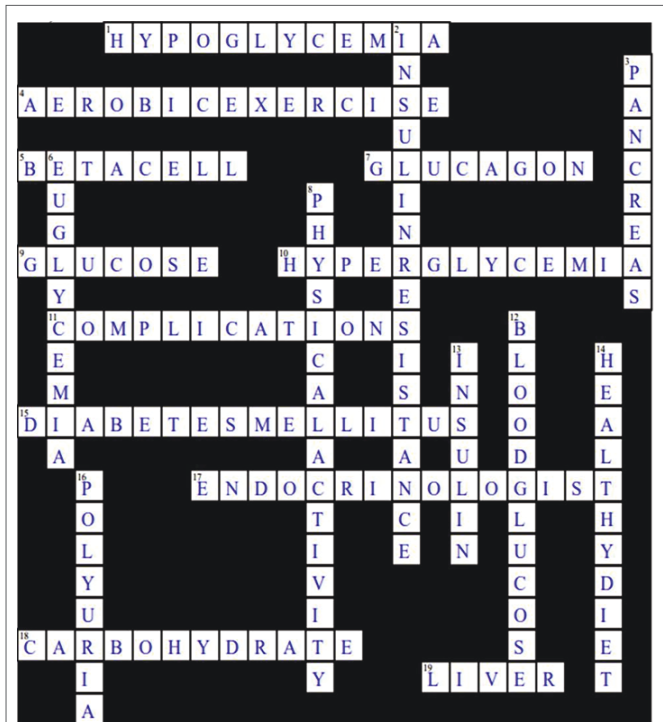
In general, crossword puzzle games are simple to create. Nowadays it is possible to use free tools offered on the Internet. These resources allow the construction of simple, efficient and highly creative educational strategies that can be incorporated into an active learning process in health education programs, including educational programs for self-control in DM. Thus, we created a model of diabetes online crossword puzzle game that may be useful to complement the diabetes education process, indicated both for patients and for health professionals (Figures 1 and 2).

For the construction of the game, first, discussions were held by the authors and brainstorming done to select the questions. An innovative crossword puzzle game was created using an online crossword maker [2]. Armored Penguin is a free site used to make word searches, crossword puzzles, and word jumbles. The site tools are simple to use on the online platform, as well as providing varied game layout options, some of which can change the format every day [3].

The game about common diabetes terms was titled 'Diabetes Crossword Puzzle Game'. Nineteen questions and answers were constructed in this game. All terms have been adapted from American Diabetes Association [4,5] as well as the current evidence and recommendations [6,7]. The clues for the game were developed in the context of keywords that represent fundamental definitions and terminologies for an approach in diabetes education to elucidate general information on the DM, and concepts that need review for use in diabetes management. Indications and suggestions with tips vary in level of difficulty: some were objective concepts, while others represented definitions that must be finished by player. Some of the suggestions were related to alternative definitions, based on everyday life of a person living with diabetes. In addition, the crossword game with free access can be solved online or printed in PDF format to be played alone or shared among friends.



**Figure 1:** Illustrative image of a Diabetes Crossword Puzzle Game developed in English language for free using.



**Figure 2:** Illustrative image of a Diabetes Crossword Puzzle Game developed in English language for free using (Answer Keys with solutions).

### Across

1. A condition characterized by a decrease in the normal level of blood glucose in the blood, usually less than 70 mg/dL.
4. Opting for a single kind of exercise is not the best choice for people with diabetes. The type of exercise that can strengthen the heart, reduces stress and improves blood circulation is: (2 Words)
5. Name of the cell responsible for secrete the hormone insulin and that is located in a region of the pancreas called pancreatic islets. (2 Words)
7. Hormone produced by alpha cells in the pancreas that raises blood glucose.
9. One of the simplest forms of sugar.
10. Excessive blood glucose.
11. Damaging effects of diabetes that, eventually, may be disabling or a life-threatening, including nerve damage (neuropathy), kidney damage (nephropathy), eye damage (retinopathy), foot damage (diabetes foot), skin damages, and others.
15. A condition that occurs by high blood sugar levels. And this type of blood sugar is called glucose. (2 Words)
17. Name of the specialist doctor in the treatment of diseases or conditions related to endocrine gland function impairment, such as diabetes.

18. One of the main nutrients in food.

19. An organ in the abdomen responsible for regulation of the metabolism of various nutrients (proteins, carbohydrates and lipids), synthesis of proteins and other molecules, degradation of hormones, storage of substances such as glycogen, and excretion of toxic substances like alcohol and poisons.

### Down

2. The inability of the body to respond and use the secreted insulin to maintain normal body glycemia. (2 Words)
3. An organ that secretes the hormones insulin, glucagon and somatostatin, in addition to enzymes that act in the digestion of the food we ingest. This organ is located in the abdomen and behind the stomach.
6. Term that refers to normal levels of sugar (glucose) in the blood.
8. The International Diabetes Federation recommends its practice at least 3 to 5 days a week, for a minimum of 30 to 45 minutes. (2 Words)
12. The sugar found in higher blood rate, which represents the most important source of body energy. This kind of carbohydrate also called blood sugar. (2 Words)
13. A hormone that regulates the amount of blood glucose. This hormone is essential for the metabolism of carbohydrates and the generation of energy for the cells of our body.
14. Type of lifestyle behavior that associated to a regular practice of physical activity can retard or prevent the type 2 diabetes. (2 Words)
16. Urinary disorder characterized by increased amount of urine (at least 2.5 liters per day for an adult) emitted during the day that is a common sign of diabetes.

We conclude that games deserve special attention from professionals, diabetes educators and patients. Developing new strategies to enhance the current method of diabetes education is of paramount importance. In addition, the sharing of secure information on the Internet, exploring information technologies and innovations of the digital age could enhance and integrate the University or the educational institution to the community and contribute to the training of health professionals more involved with the current virtual society. But studies are needed to evaluate the impact of this kind of tool in health education.

### Conflict of Interest

None

### References

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