From Chaos to Clarity: Use of Mind Maps as a Tool to Ensure Better Learning among Medical Students

Sir,

The width and the depth of the information that medical students are expected to master in their undergraduate period of training is huge, and considering the limited learning strategies that are available to them makes the task even more challenging.[1] The entire process of learning the huge amount of information can be overwhelming for medical students and might result in frustration and emotional disturbances.[1] This potential gap in the acquisition of knowledge has ushered medical educationists and researchers to extensively conduct research work on learning strategies that might help the future generation of medical doctors to efficiently and effectively acquire knowledge and skills.[1,2]

Mind Mapping in Medical Education

Mind maps refer to the multi-sensory tools that aid medical students to integrate, organize, visualize, and subsequently retain and recall information for longer periods of time.[3] These mind maps can be either created manually or using applications (viz. digital ones—which can be edited and revised a multiple number of times) and generally comprise a central theme, with different branches that depict different sub-themes on the same topic.[4] This innovative tool has been widely employed in medical education both for the sake of teaching and learning and assists the students to understand complex medical concepts.[5] The simplification of complex areas of medicine also helps students in the process of arriving at clinical diagnosis and facilitating patient care-related services, by encouraging critical thinking and bridging the gap between basic sciences and clinical subjects.[3-5]

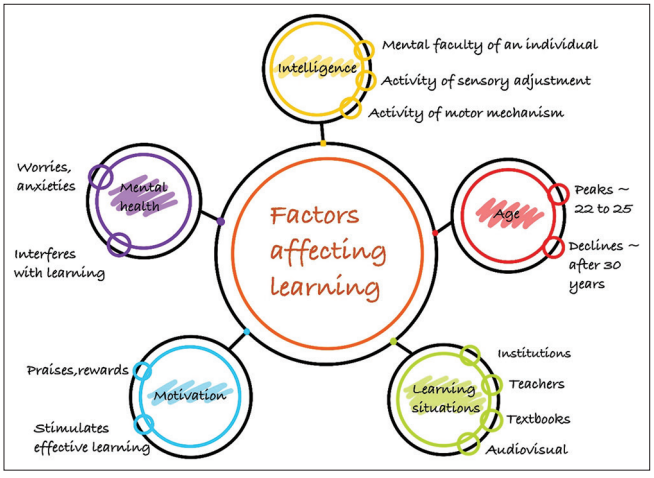

Figure 1: Hierarchical mind map (factors affecting learning)

Types of Mind Maps

Mind maps can be of different types in medical education, with each one having specific characteristics and plus points.[1-7] Hierarchical mind maps are the commonest one, with a central theme and multiple other sub-themes branching out from it, and is extensively used to summarize the available information from different learning resource and to visualize how different concepts are related to each other [Figure 1]. Flowchart mind maps tend to depict the sequence of a specific topic and are generally used to understand diagnostic/treatment algorithms or the process of arriving at a specific decision or even to visualize the specific tasks that must be done to reach the end product [Figure 2].[4-6]

Spider mind maps begin with a central idea, then have branches in all directions, and are precisely useful in brainstorming sessions or to summarize huge information [Figure 3]. Tree mind maps, though in principle are like hierarchical ones, but have a more complex branching structure, and are being employed to organize that information that has multiple levels [Figure 4]. Finally, concept maps are another type of mind map, wherein different concepts are linked together with the

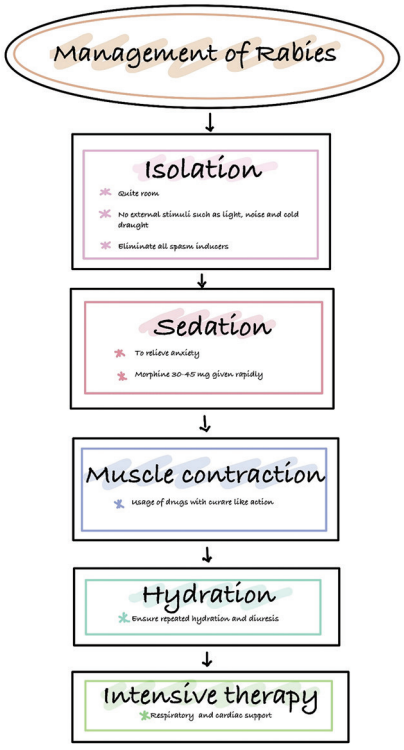

Figure 2: Flowchart mind map (management of rabies)

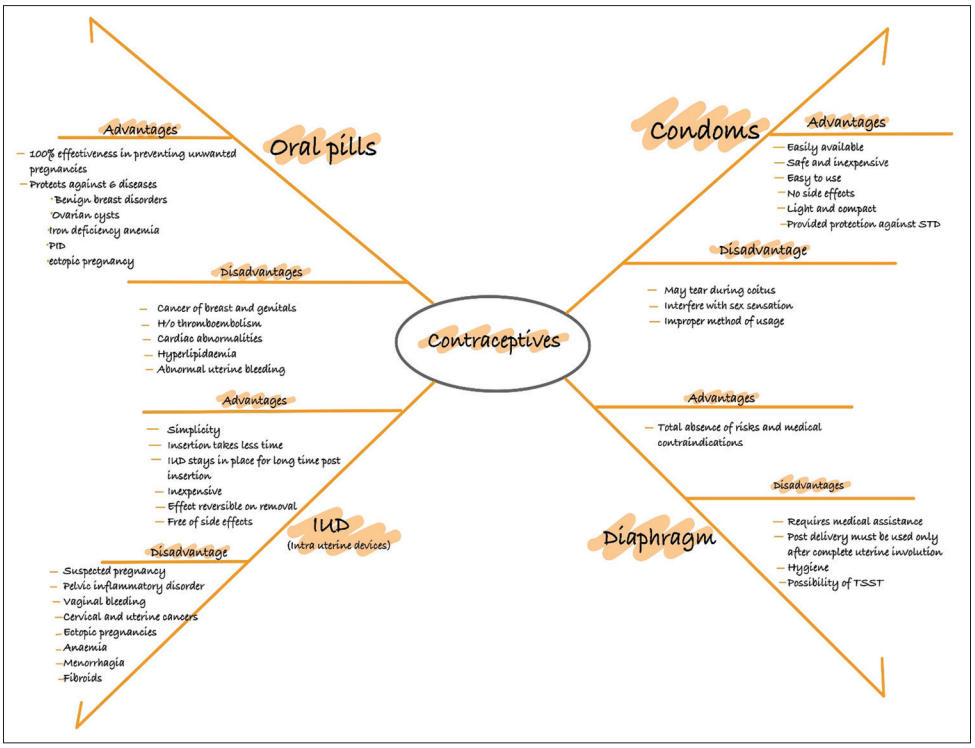

Figure 3: Spider mind map (advantages and disadvantages of contraceptives)

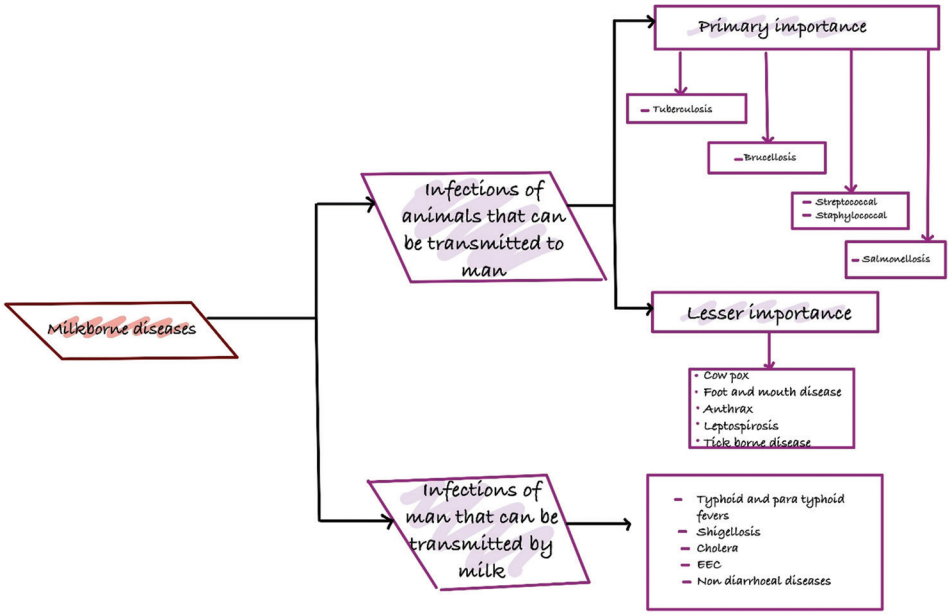

Figure 4: Tree mind map (milk-borne diseases)

help of labels and arrows, and are used to understand complex information [Figure 5].[3-5] Depending on the context and the area that we are dealing with, we can employ different types of mind maps to expedite the learning process and benefit the students in attaining the learning outcomes.[3-7]

Applications of mind maps

Mind maps offer multiple benefits to students and have shown immense potential to expedite the learning process. The applications can range from organization and synthesis of information in such a manner that it becomes relatively easy to comprehend and remember.[8] In other words, the employment of mind maps can make the learning process joyful and less overwhelming by minimizing the problem of information overload.[8] At the same time, it can help the students to retain

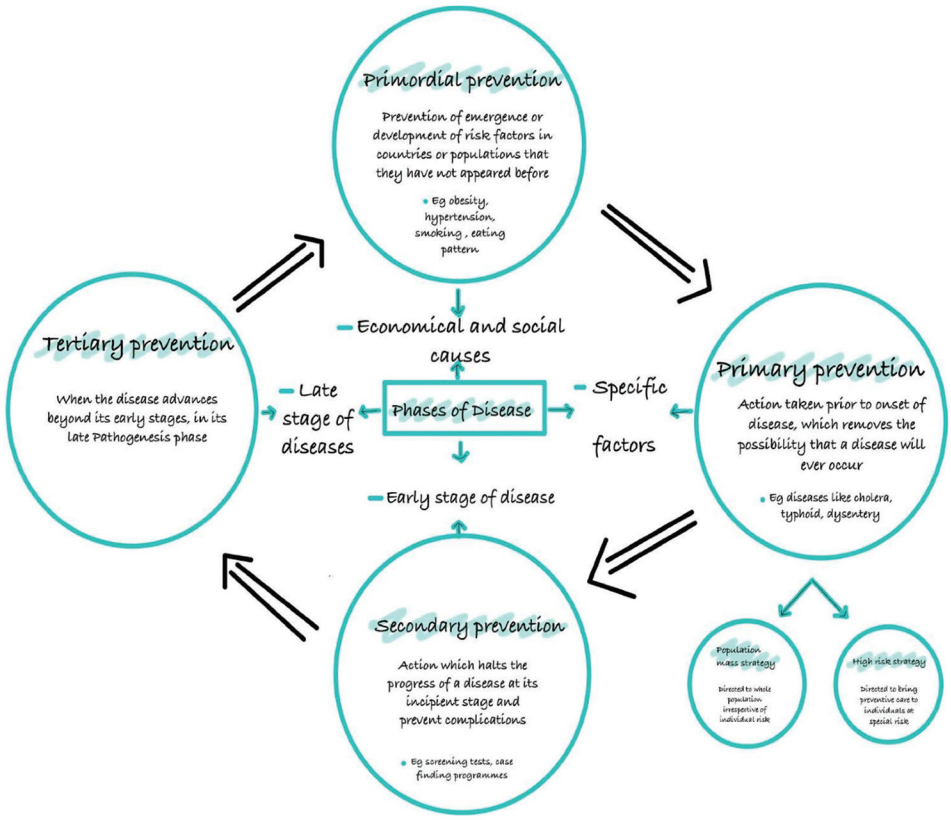

Figure 5: Concept mind map (levels of prevention)

complex medical information in simplified topics, and in the process, they also understand the relationship between different parts. As mentioned above, mind maps can expedite problem-solving and decision-making skills (flowchart mind maps), as students can visualize different variables.[5,9] In addition, these tools also enhance creativity and critical thinking by motivating students to generate novel ideas to sort out the given problems.[10,11]

Even before examinations, when students have the pressure of completing the revision of the entire syllabus, mind maps enable them to revise the entire portion easily, readily, and efficiently, which might not be the case if students have to read textbooks or read their notes (both are time-consuming).[7-9] The digital mind maps offer the option of collaborative learning, wherein students learn from their peers by reviewing and sharing their mind maps with each other.[4] As mind maps are generally figure types, it helps to a great extent those learners who have a visual or linear-oriented type of preferred learning style. The findings of a study revealed that the employment of the mind map as a learning technique significantly aided the recall of both short-term and long-term memories, especially when it is about facts.[12] In addition, the student who used mind maps also had higher levels of motivation to learn in comparison with the other group.[12]

Limitations of Mind Maps

Mind maps have their own share of limitations, and these must be taken into consideration to ensure that they are used in the right settings and do not interfere with the learning process. The first limitation is that it is not suitable for all kinds of information, and thus, they are not suitable if we are dealing with abstract ideas.[1,3] Further, it might be a time-consuming exercise for students to design them, unless students are familiar with it or are well trained to do it via software applications (even their accessibility is a cause of concern). This can prove to be a big challenge for students who are always having limited time to learn a lot of information. At the same time, we cannot deny that not all students will be comfortable with learning using mind maps (in other words, not suitable for students with different learning styles) or even designing them.[1,5] Thus, a teacher should be wise enough to employ a combination of learning methodologies to benefit all students. Regardless of these potential limitations, mind maps still have immense scope and utility in facilitating the delivery of medical education.[7-9]

Conclusion

In conclusion, mind mapping is an effective and versatile tool for organizing and synthesizing information in medical education and thus has multiple applications. As mind maps have their share of utility and limitations, we must employ them based on the settings and use them as a supplementary tool to enable students to learn complex topics and thereby attain learning competencies.

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Conflicts of interest

There are no conflicts of interest.

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