

## EDITORIAL

# Trends and Prospects in Public Health Education: A commentary

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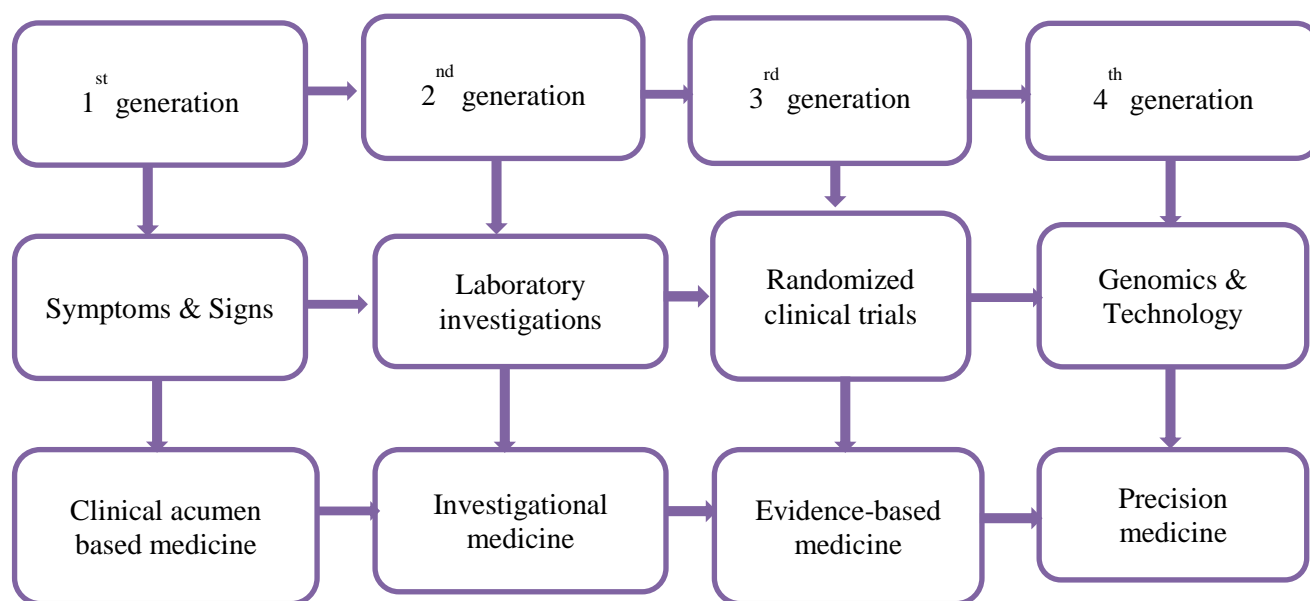
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Science progresses over time. New approaches are built over old methods and that paves way for progress. In the field of public health education also there has been tremendous growth and development over the years. These changes have kept abreast with the progress in the field of medicine. In clinical medicine, the old school was based on asking patients about their symptoms and eliciting signs to make clinical diagnosis and recommend treatment. In this approach history taking of the patient was vital and a great emphasis was placed on clinical acumen.<sup>1</sup> This phase can be called as the first generation approach. Slowly this approach was replaced by developments in biochemistry, microbiology and pathology which led to laboratory investigations that could assist in diagnosis and guide treatment.<sup>2</sup> This was the era of investigational medicine and can be called as the second generation medicine. The third generation medicine was influenced by the conducting of

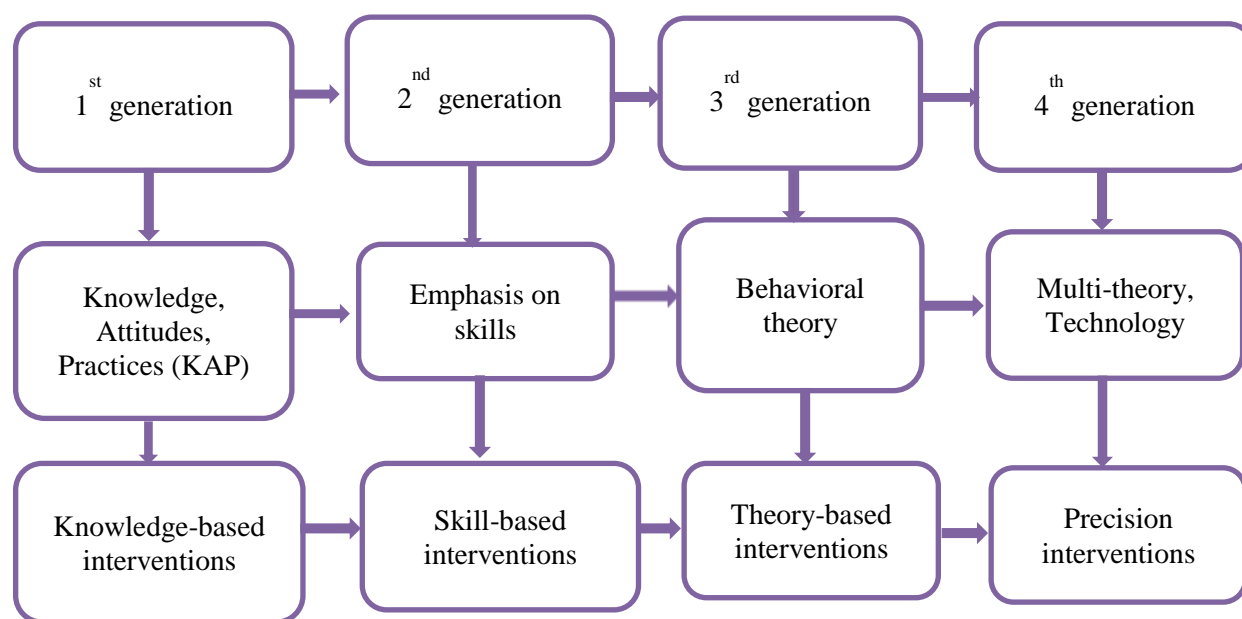
Randomized Controlled Trials (RCTs).<sup>3</sup> All drug testing is based on RCTs and so are a variety of medical procedures that have to go through the rigors of RCTs which are considered as gold standards. This phase has been called as the era of evidence-based medicine which is still going on.<sup>4</sup> However, recently with genetic mapping and the advent of genomics and associated fields like pharmacogenomics,<sup>5</sup> nutrigenetics, and nutrigenomics<sup>6</sup> a new trend is being developed in the form of precision medicine<sup>7</sup> which is the fourth generation approach in medicine. This approach is also making concerted use of technology. Former US President Barack Obama launched the National Institutes of Health (NIH) Precision Medicine Initiative (PMI) in January 2015.<sup>8</sup> Precision medicine uses the concepts of personalized medicine at a more precise level through advancements in science and technology including genetics and genomics sequencing (Figure 1).<sup>9</sup>



**Figure 1.** Trends in clinical medicine interventions

A parallel movement can be seen in the field of public health education which though may be not directly but certainly indirectly has been affected by trends in clinical medicine. In the 1970s and 80s, public health education primarily family planning research relied heavily on Knowledge, Attitudes, Practices (KAP) surveys<sup>10, 11</sup> and consequently designed knowledge-based interventions in 70s and 80s.<sup>12,13</sup> However, it was found that knowledge was necessary but was not sufficient for behavior change which is considered as the desired outcome of public health education efforts.<sup>14</sup> So this first generation effort was replaced by second generation approach of developing skill-based health education interventions in the 1990s. In this regard several approaches were developed and tested such as interventions to combat HIV/AIDS epidemic,<sup>15, 16</sup> refusal skills interventions in adolescents,<sup>17-19</sup> problem solving interventions,<sup>20, 21</sup> and others. The second generation approach was a good trend but behavior change remained elusive. So as a result the third generation interventions started appearing mainly in the 2000s that entailed use of behavioral

theories more on lines with evidence-based medicine and they were part of evidence-based practice in public health. Some of the theories used were health belief model,<sup>22</sup> transtheoretical model,<sup>23</sup> theory of reasoned action,<sup>24</sup> theory of planned behavior,<sup>25</sup> theories of stress and coping,<sup>26,27</sup> social cognitive theory,<sup>28</sup> social marketing,<sup>29</sup> diffusion of innovations,<sup>30</sup> Freire's model of adult education,<sup>31</sup> emotional intelligence theory,<sup>32</sup> Information-Motivation-Behavioral skills (IMB) model,<sup>33</sup> self-determination theory,<sup>34</sup> PRECEDE-PROCEED model,<sup>35</sup> socio-ecological models,<sup>36</sup> and others. The theory-based trend is still continuing but is slowly getting replaced by a new trend of fourth generation interventions that entail use of multiple theories and relies on technology for behavior change. Some notable developments in this regard include integrative model of behavioral prediction,<sup>37</sup> theory of triadic influence,<sup>38</sup> Multi-Theory Model (MTM) of health behavior change<sup>14, 39</sup> and others. These interventions are also utilizing advancements in technology such as computers, tablets, smart phones, apps, etc. (Figure 2).<sup>40-42</sup>



**Figure 2.** Trends in health education and health promotion interventions

The fourth generation interventions are currently being tested. One of the fourth generation theory, MTM of health behavior change<sup>14, 39</sup> is particularly promising because it is very practical, parsimonious and easily replicable. The theory divides the behavior change into (1) initiation or starting of the behavior change which is explained by three constructs namely participatory dialogue in which advantages of changing behavior outweigh the disadvantages, behavioral confidence and changes in physical environment, and (2) sustenance of the behavior which is explained by the constructs of emotional transformation, practice for change and changes in social environment.<sup>14,39</sup> Notwithstanding that this is a new theory MTM has already been utilized in number of studies. For example, its constructs have been used in promoting drinking water instead of sugar sweetened beverages and they accounted for about 62% of the variance in the initiation and approximately 58% of the variance in the sustenance.<sup>43</sup> The constructs have also been applied for predicting change in eating small portion sizes as opposed to eating large portion sizes and accounted for about 37% of the variance in the initiation and about 21% of the variance in sustenance.<sup>44</sup> The constructs have also been

applied for predicting physical activity behavior change in college students and accounted for about 26% of the variance in initiation of physical activity behavior in sedentary students and approximately 30% of the variance in sustenance of physical activity behavior.<sup>45</sup> MTM has also been utilized to predict adequate sleep behavior where for initiation constructs accounted for about 24% of the variance while for sustenance constructs accounted for about 34% of the variance.<sup>46</sup> MTM based interventions have the potential for being brief, delivered both face-to-face and online, utilize technology and being very precise. More researchers should reify this theory.

In conclusion, it can be stated that the future of behavior change interventions in public health education lie in utilizing multiple theories and developing, implementing and evaluating robust programs. The trend in this direction has already started and will come to fruition in the coming decade where we can see multitude of such interventions with a myriad of behaviors and target populations.

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