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Cystoscopy training for residents and urologists: the contrast between cost-effectiveness and technological progress.

El aprendizaje en cistoscopia por parte de residentes y urólogos: el contraste entre lo costo-efectivo y el avance tecnológico.

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Dear Director:

We have read with particular interest the study by Berrosteguieta et al (1) entitled: "Learning curve for flexible cystoscopy in residents and urologists in Latin America" which aimed to determine the learning curve for this technique among urologists in Latin America. Therefore, we would like to make the following observations.

The authors, within the limitations, clarify the subjectivity and low number of their sample, but do not specify what the bias control strategies were. No section of the methodology mentions whether the sampling was probabilistic or not, or if it was by convenience. In original studies, we consider that methodological aspects should not be ignored and should always be mentioned textually. Berrosteguieta et al (1) refer to the usefulness of simulators; however, they mention the absence of cost-effective tools for cystoscopy practice. In contrast, Shah et al (2) describe a method for cystoscopy simulation, which can be considered cost-effective with porcine bladders (males, since a certain length of urethra is needed to secure the bladders and provide a realistic simulation), where the urethra was cut leaving a small stump, which allowed for a more optimal simulation, thus demonstrating an alternative for a better learning curve.

Different numbers of practices required to obtain an adequate learning curve with respect to flexible cystoscopy are defined depending on the different literatures, however, the use of advanced technology such as artificial intelligence (AI) or simulation in practical learning environments is not defined (1). Gómez et al (3) describe that the role of simulation is important and the use of virtual simulations for preoperative planning and as a learning aid; simulations allow learning essential skills and improve student participation; additionally, AI for surgical training offers a controlled environment in which techniques can be improved, allowing the acquisition and evaluation of skills before attempting them in patients (3).

Traditional medical education routinely trains students while repetitively performing a task under the supervision of an expert. There are limitations to this methodology, such as patient complications and time-limited feedback; demonstrating that technology could be used to enhance clinical education (3).

In conclusion, it is essential to highlight the importance of cost-effective alternatives for acquiring theoretical skills in centers with limited technological and financial resources. The future of medical education and practice will be shaped by AI, a tool that optimizes learning, strengthens clinical diagnosis, and transforms professional training. The authors' research is noteworthy, as it lays

the groundwork for the creation of pedagogical strategies that enable better training for urology residents and, consequently, better surgical outcomes for patients.

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