Visit

for the latest coverage and read



Innovative Educational Approach in Healthcare-Associated Infection Prevention and Control. Results of a European Study

International Workshop on Gerontechnology

"IWoG 2021: Gerontechnology IV pp 399-407 | Cite as

Conference paper

First Online: 23 March 2022

Part of the Lecture Notes in Bioengineering book series (LNBE)

Abstract

Prevent and control healthcare-associated infections (HAIs) is a priority in healthcare assistance, not only due to present COVID-19 pandemic. Annually, around 3.2 million patients are affected by one of these infections and it is estimated that without controlling them, by 2050, 10 million more people could die every year, with especial relevance among elderly with infectious situations representing a third of mortality in people over 65 years old. Higher Education Institutions (HEI) in healthcare area have an important role in this panorama, by preparing students to be future professionals, stimulating them to have an innovative and entrepreneurial approach to today's real-life challenges. A mixed-methods research was conducted, at European level (in Portugal, Finland, Poland and Spain), to facilitate learning of good practices on HAIs prevention and control while developing innovative solutions. 1475 participants were enrolled, from all partner HEI: 79 professors and mentors were interviewed (individual or focus group), 1326 final year nursing students made a self-report inventory (application of InovSafeCare Scale) and 70 students participated on focus group (agile piloting of the Model). The result of this research is a pedagogical model that mixes dimensions and methods that take nursing students closer to the demands of HAIs prevention and control and capacitates them to transfer knowledge to work settings with an innovative and entrepreneurial perspective – the InovSafeCare Model.

Keywords

Healthcare Associated Infections (HAIs) Elderly Nursing education InovSafeCare Model Entrepreneurship

This is a preview of subscription content, log in to check access.

Notes

Acknowledgments

We acknowledge professor ${f Carsilda\ Vaz\ Sarroeira}$ for her contribution to the design of ${\it InovSafeCare\ Model}$, essential to this final achievement.

Funding

ERASMUS+ Programme (InovSafeCare Project: 2018-1-PT01-KA203-047453).

References

Harbarth, S., Sax, H., Gastmeier, P.: The preventable proportion of nosocomial infections: an overview of published reports. J. Hosp. Infect. 54, 258–66 (2003). https://doi.org/10.1016/s0195-6701(03)00150-6 (https://doi.org/10.1016/s0195-6701(03)00150-6)
 CrossRef (https://doi.org/10.1016/s0195-6701(03)00150-6)

Google Scholar_(http://scholar.google.com/scholar_lookup?

 $title=The \%20 preventable \%20 proportion \%20 of \%20 no so comial \%20 in fections \%3A\%20 an \%20 overview \%20 of \%20 published \%20 reports \& author=S.\%20 Harbarth \& author=H.\%20 Sax \& author=P.\%20 Gast meier \& journ al=J.\%20 Hosp.\%20 In fect. \& volume=54 \& pages=258-66 \& publication_year=2003 \& doi=10.1016\%2 Fs0195-6701\%2803\%2900150-6)$

Council of the European Union: Council conclusions on patient safety and quality of care, including the
prevention and control of healthcare-associated infections and antimicrobial resistance (2014/C 438/05).
 Official Journal of the European Union (2014)

 $\underline{Google\ Scholar\ }\ \underline{\ (https://scholar.google.com/scholar?}$

 $\label{lem:proposed} $$q=Council%20of\%20the\%20European\%20Union\%3A\%20Council\%20conclusions\%20on\%20patient\%20sa fety\%20and\%20quality\%20of\%20care\%2C\%20including\%20the\%20prevention\%20and\%20control\%20of\%20healthcare-$

 $\frac{associated\%20 infections\%20 and \%20 antimicrobial\%20 resistance\%20\%282014\%2 FC\%20438\%2 F05\%29.\%2000 fficial\%20 Journal\%20 of \%20 the \%20 European\%20 Union\%20\%282014\%29)$

3. ECDC: European Centre for Disease Prevention and Control. An agency of the European Union (2019) Google Scholar (https://scholar.google.com/scholar?

 $\label{eq:control} $$q=ECDC\%3A\%20European\%20Centre\%20for\%20Disease\%20Prevention\%20and\%20Control.\%20An\%20agency\%20of\%20the\%20European\%20Union\%20\%282019\%29)$

 Kline, K.A., Bowdish, D.M.: Infection in an aging population. Curr. Opin. Microbiol. 29, 63–67 (2016). https://doi.org/10.1016/j.mib.2015.11.003
 (https://doi.org/10.1016/j.mib.2015.11.003)

CrossRef_(https://doi.org/10.1016/j.mib.2015.11.003)

Google Scholar (http://scholar.google.com/scholar_lookup?

 $\label{linear} {\it title=Infection\%20in\%20an\%20aging\%20population\&author=KA.\%20Kline\&author=DM.\%20Bowdish\&journal=Curr.\%20Opin.\%20Microbiol.\&volume=29\&pages=63-column=6.$

 $\underline{67\&publication_year=2016\&doi=10.1016\%2Fj.mib.2015.11.003)}$

 Castella, A., et al.: Surgical site infection surveillance: analysis of adherence to recommendations for routine infection control practices. Infect. Control Hosp. Epidemiol. 27, 835–40 (2006).

https://doi.org/10.1086/506396 (https://doi.org/10.1086/506396)

CrossRef (https://doi.org/10.1086/506396)

Google Scholar (http://scholar.google.com/scholar_lookup?

 $\label{lem:control} \hline title=Surgical\%20site\%20infection\%20surveillance\%3A\%20analysis\%20of\%20adherence\%20to\%20recommendations\%20for\%20routine\%20infection\%20control\%20practices&author=A.\%20Castella&journal=Infect.\%20Control\%20Hosp.\%20Epidemiol.&volume=27&pages=835-40&publication_year=2006&doi=10.1086\%2F506396)$

6. Zhou, Y., et al.: Healthcare-associated infections and shanghai clinicians: a multicenter cross-sectional study. PLoS One 9(8), e105838 (2014). https://doi.org/10.1371/journal.pone.0105838

(https://doi.org/10.1371/journal.pone.o105838)

 $\underline{CrossRef} \hspace{0.2cm} (https://doi.org/10.1371/journal.pone.o105838)$

Google Scholar (http://scholar.google.com/scholar_lookup?title=Healthcare-associated%20infections%20and%20shanghai%20clinicians%3A%20a%20multicenter%20cross-

sectional%20study&author=Y.%20Zhou&journal=PLoS%20One&volume=9&issue=8&pages=e105838&publication_year=2014&doi=10.1371%2Fjournal.pone.0105838)

7. Kołpa, M., Grochowsk, A., Gniadek, A., Jurkiewicz, B.: Level of knowledge among medical personnel about infections transferred through direct contact – results of questionnaire survey. Przegl. Epidemiol. **69**, 503–6 (2015)

Google Scholar (http://scholar.google.com/scholar_lookup?

 $title=Level\%200f\%20knowledge\%20among\%20medical\%20personnel\%20about\%20infections\%20transferred\%20through\%20direct\%20contact\%20\%E2\%80\%93\%20results\%200f\%20questionnaire\%20survey&author=M.\%20Ko\%C5\%82pa&author=A.%20Grochowsk&author=A.%20Gniadek&author=B.%20Jurkiewicz&journal=Przegl.%20Epidemiol.&volume=69&pages=503-6&publication_year=2015)$

8. WHO: Health care without avoidable infections. The critical role of infection prevention and control. WHO, Geneve (2016)

Google Scholar (https://scholar.google.com/scholar?

 $\label{eq:proposed_q_sol} $$q=WHO\%3A\%20$ Health%20$ care%20$ without%20$ avoidable%20$ infections.%20The%20$ critical%20$ role%20$ of $\%20$ infection%20$ prevention%20$ and $\%20$ control.%20$ WHO%2C\%20$ Geneve%20$ $\%282016\%29$)$

9. WHO: Global infection prevention and control priorities 2018–22: a call for action, Lanc, vol. 5, December 2017, pp. e1178–80 (2017)

Google Scholar (https://scholar.google.com/scholar?

 $\label{eq:whows} $$q=WHO\%3A\%20Global\%20infection\%20prevention\%20and\%20control\%20priorities\%202018\%E2\%80\%9\\ 322\%3A\%20a\%20call\%20for\%20action\%2C\%20Lanc\%2C\%20vol.\%205\%2C\%20December\%202017\%2C\%\\ 20pp.\%20e1178\%E2\%80\%9380\%20\%282017\%29)$

 $10.\ da\ Silva,\ M.I.L.:\ Pr\'atica\ Educativa,\ Teoria\ e\ Investiga\~ção.\ Rev\ Intera\~ções\ {\bf 27},\ 283-304\ (2013)$

Google Scholar_(https://scholar.google.com/scholar?

11. Simão, A.: Integrar os princípios da aprendizagem estratégica no processo formativo dos professores. In: Silva, A., Duarte, A., Sá, I., Simão, A. (eds.) Aprendizagem Auto-Regulada pelo Estudante. Perspectivas psicológicas e educacionais, pp. 95–106. Porto Editora, Porto (2004)

Google Scholar (https://scholar.google.com/scholar?

 $\frac{q=Sim\%C3\%A30\%2C\%20A.\%3A\%20Integrar\%200s\%20princ\%C3\%ADpios\%20da\%20aprendizagem\%20es}{trat\%C3\%A9gica\%20no\%20processo\%20formativo\%20dos\%20professores.\%20In\%3A\%20Silva\%2C\%20A. \%2C\%20Duarte%2C\%20A.\%2C\%20S\C3\%A1\%2C\%20I.\%2C\%20Sim\%C3\%A30\%2C\%20A.\%20\%28eds.\%29\%20Aprendizagem\%20Auto-$

 Campbell, A., Gutierrez, M., Lancelott, M.: Operating Model Canvas. Aligning Operations and Organization with Strategy. Van Haren Publishing (2017). ISBN 978-94-018-0071-6

Google Scholar (https://scholar.google.com/scholar?

 $\label{eq:control} $$q=Campbell\%2C\%20A.\%2C\%20Gutierrez\%2C\%20M.\%2C\%20Lancelott\%2C\%20M.\%3A\%20Operating\%20$$ Model\%20Canvas.\%20Aligning\%20Operations\%20and\%20Organization\%20with\%20Strategy.\%20Van\%20Haren\%20Publishing\%20\%282017\%29.\%20ISBN\%20978\%2094\%20018\%200071\%206)$

13. Laureano-Cruces, A.L., Ramírez-Rodríguez, J., Mora-Torres, M., Arriaga, F., Escarela-Pérez, R.: Cognitive-operative model of intelligent learning systems behavior. Interact. Learn. Environ. 18(1), 11–38 (2010). https://doi.org/10.1080/10494820802160872 (https://doi.org/10.1080/10494820802160872)
CrossRef (https://doi.org/10.1080/10494820802160872)

Google Scholar_(http://scholar.google.com/scholar_lookup?title=Cognitive-

operative %20 model %20 of %20 in telligent %20 learning %20 systems %20 behavior & author = AL. %20 Laureano-Cruces & author = J. %20 Ram %C3 %AD rez-Rodr %C3 %AD guez & author = M. %20 Mora-Rodr %C

Torres&author=F.%20Arriaga&author=R.%20Escarela-

 $\frac{P\%C3\%Agrez\&journal=Interact.\%20Learn.\%20Environ.\&volume=18\&issue=1\&pages=11-38\&publication_year=2010\&doi=10.1080\%2F10494820802160872)$

14. Pinto, M.R., et al.: Educating nursing students for innovative infection prevention and control practices: the InovSafeCare model. In: Proceedings of 1st CIEQV International Congress, Santarém, 18–19 February 2021, pp. 101–2 (2021)

 $\underline{Google\ Scholar}\ \ (https://scholar.google.com/scholar?$

 $\label{eq:pinto} $$q=$Pinto%2C\%20M.R.\%2C\%20et\%20al.\%3A\%20Educating\%20nursing\%20students\%20for\%20innovative \%20infection\%20prevention\%20and\%20control%20practices\%3A\%20the\%20InovSafeCare%20model.\%20In\%3A\%20Proceedings\%20of\%201st\%20CIEQV\%20International\%20Congress\%2C\%20Santar\%C3\%A9m \%2C\%2018\%E2\%80\%9319\%20February\%202021\%2C\%20pp.\%20101\%E2\%80\%932\%20\%282021\%29)$

15. Perrotta, F., et al.: COVID-19 and the elderly: insights into pathogenesis and clinical decision-making. Aging Clin. Exp. Res. 32(8), 1599–1608 (2020). https://doi.org/10.1007/s40520-020-01631-y

(https://doi.org/10.1007/s40520-020-01631-y)

CrossRef (https://doi.org/10.1007/s40520-020-01631-y)

Google Scholar (http://scholar.google.com/scholar_lookup?title=COVID-

 $19\%20 and \%20 the \%20 elderly \%3A\%20 in sights \%20 into \%20 pathogenesis \%20 and \%20 clinical \%20 decision-making \&author=F.\%20 Perrotta \& journal=Aging \%20 Clin.\%20 Exp.\%20 Res. \& volume=32 \& issue=8 \& pages=1599-160 8 \& publication_year=2020 \& doi=10.1007\%2 Fs40520-020-01631-y)$

16. Yurrebaso-Macho, A., et al.: Nursing students' perceptions on healthcare-associated infection control and prevention teaching and learning experience: development and validation of a scale in four European countries. Front. Psychol. 12, 701208 (2021). https://doi.org/10.3389/fpsyg.2021.701208

(https://doi.org/10.3389/fpsyg.2021.701208)

 $\underline{CrossRef} \hspace{0.2cm} \text{(https://doi.org/10.3389/fpsyg.2021.701208)}$

 $\underline{\textbf{Google Scholar}} \hspace{0.2cm} (\text{http://scholar.google.com/scholar_lookup?}$

title = Nursing % 20 students % E2 % 80 % 99 % 20 perceptions % 20 on % 20 health care-title = Nursing % 20 students % E2 % 80 % 99 % 20 perceptions % 20 on % 20 health care-title = Nursing % 20 students % E2 % 80 % 99 % 20 perceptions % 20 on % 20 health care-title = Nursing % 20 students % E2 % 80 % 99 % 20 perceptions % 20 on % 20 health care-title = Nursing % 20 students % E2 % 80 % 99 % 20 perceptions % 20 on % 20 health care-title = Nursing % 20 students % E2 % 80 % 99 % 20 perceptions % 20 health care-title = Nursing % 20 students % E2 % 80 % 99 % 20 perceptions % 20 health care-title = Nursing % 20 students % E2 % 80 % 99 % 20 perceptions % 20 health care-title = Nursing % 20 students % 20 health care-title = Nursing % 20 health care-title

associated % 20 in fection % 20 control % 20 and % 20 prevention % 20 teaching % 20 and % 20 learning % 20 experience % 3A % 20 development % 20 and % 20 validation % 20 of % 20 a % 20 scale % 20 in % 20 four % 20 European % 20 countries & author = A. % 20 Yurrebaso-

 $\label{lem:macho&journal=Front.%20Psychol.&volume=12&pages=701208&publication_year=2021&doi=10.3389\%2 Ffpsyg.2021.701208)$

17. Adkins, J.: Active learning and formative assessment in a user-centred design course. Inf. Syst. Educ. J. 16(4), 34–40 (2018). ISSN 1545-679X

 $\underline{Google\ Scholar}\ \ (http://scholar.google.com/scholar_lookup?$

title=Active%20learning%20and%20formative%20assessment%20in%20a%20user-centred%20design%20course&author=J.%20Adkins&journal=Inf.%20Syst.%20Educ.%20J.&volume=16&issue=4&pages=34-40&publication_vear=2018)

18. Laureano-Cruces, A., Terán-Gilmore, A., de Arriaga, F., El Alami, M.: La importancia de las estrategias cognitivas en el disseño del curricula didáctico. In: Sossa Azuela, H., Sánchez Guerrero, H., Polito Olvera, J., Fuenlabrada Velásquez, S. (eds.) Proceedings XVI Congreso Nacional y II Congreso Internacional de Informática y Computación de la ANIEI, vol. I, pp. 35–41. Zacatecas, México (2003)

 $\underline{\textbf{Google Scholar}} \hspace{0.2cm} (\text{https://scholar.google.com/scholar?q=Laureano-lau$

Cruces%2C%20A.%2C%20Ter%C3%A1n-

 $\label{eq:gilmore} Gilmore \& 2C\% 20A. \& 2C\% 20de \& 20Arriaga \& 2C\% 20F. \& 2C\% 20El\% 20Alami \& 2C\% 20M. \& 3A\% 20La\% 20 importancia \& 20de \& 20las \& 20estrategias \& 20cognitivas \& 20en \& 20el\% 20disse & C3\%B10\% 20del \& 20curricula & 20did & C3\%A1ctico. & 20In\% 3A\% 20Sossa & 20Azuela & 2C\% 20H. & 2C\% 20S\% C3\%A1nchez & 20Guerrero & 2C\% 20H. & 2C\% 20Polito & 20Olvera & 2C\% 20J. & 2C\% 20Fuenlabrada & 20Vel & C3\%A1squez & 2C\% 20S. & 20\% 20es & 20920 & 20Fuenlabrada & 20Vel & C3\%A1squez & 2C\% 20S. & 20\% 20es & 20920 & 20Inform & C3\%A1tica & 200\% 20Computaci & C3\%B3n\% 20de & 20la & 20ANIEI & 2C\% 20Vol. & 20I\% 2C\% 20pp. & 2035\% E2\% 80\% 9341. & 20Zacatecas & 2C\% 20M & C3\%A9xico & 20\% 282003 & 29)$

19. Ku, Y.-L.: Evaluating creative thinking of RN-BSN students in the course of clinical case study and practicum. Innov. Educ. Teach. Int. **52**(3), 290–299 (2015).

 $\underline{\text{https://doi.org/10.1080/14703297.2013.838144}} \ \ (\text{https://doi.org/10.1080/14703297.2013.838144})$

CrossRef (https://doi.org/10.1080/14703297.2013.838144)

Google Scholar (http://scholar.google.com/scholar_lookup?

title=Evaluating%20creative%20thinking%20of%20RN-

 $BSN\%20students\%20in\%20the\%20course\%20of\%20clinical\%20case\%20study\%20and\%20practicum\&aut $$hor=Y-L.\%20Ku\&journal=Innov.\%20Educ.\%20Teach.\%20Int.\&volume=52\&issue=3\&pages=290-299\&publication_year=2015\&doi=10.1080\%2F14703297.2013.838144)$

- 20. Alves, C., Felgueira, T., Paiva, T.: Competências empreendedoras. In: Parreira, P.M., Alves, L., Mónico, L., Sampaio, J., Paiva, T.: Competências empreendedoras no Ensino Superior Politécnico: Motivos, influências, serviços de apoio e educação, pp. 65–76. Instituto Politécnico da Guarda, Guarda (2018) Google Scholar (https://scholar.google.com/scholar?
- 21. Dearnly, C., McClelland, G., Irving, D.: Innovation in Teaching and Learning in Health Higher Education: Literature Review. Council of Deans of Health and the Higher Education Academy, Bradford (2013)

 Google Scholar_(https://scholar.google.com/scholar?
- Stefani, L.: Planning teaching and learning. Curriculum design and development. In: Fry, H., Ketteridge, S., Marshall, S. (eds.) A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice, 3rd edn., pp. 40–57. Routledge, New York (2009). ISBN 1

Google Scholar (https://scholar.google.com/scholar?

Copyright information

© The Author(s), under exclusive license to Springer Nature Switzerland AG 2022

About this paper

Cite this paper as:

Pinto M..R. et al. (2022) Innovative Educational Approach in Healthcare-Associated Infection Prevention and Control. Results of a European Study. In: García-Alonso J., Fonseca C. (eds) Gerontechnology IV. IWoG 2021. Lecture Notes in Bioengineering. Springer, Cham. https://doi.org/10.1007/978-3-030-97524-1_37

First Online

23 March 2022

DOI

https://doi.org/10.1007/978-3-030-97524-1_37

Publisher Name

Springer, Cham

Print ISBN

978-3-030-97523-4

Online ISBN

978-3-030-97524-1

eBook Packages

Engineering

Engineering (R0)

Reprints and Permissions

SPRINGER NATURE

© 2020 Springer Nature Switzerland AG. Part of <u>Springer Nature</u>. Not logged in \cdot Not affiliated \cdot 95.92.6.170