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Impact of increased digital use and internet gaming on nursing students' empathy: A cross-sectional study

[Lee, Wan Ling^a](#) ; [Rambiar, Puteri Nur Iman Muhammad Shyamil^a](#); [Rosli, Nurin Qistina Batrisya^a](#);[Nurumal, Mohd Said^b](#) ; [Abdullah, Sharifah Shafinaz Sh.^c](#) ; [Danaee, Mahmoud^d](#) [Save all to author list](#)^a Department of Nursing Science, Faculty of Medicine, University of Malaya, Kuala Lumpur, 50603, Malaysia^b Kulliyah of Nursing, International Islamic University Malaysia, Kuantan, 25200, Malaysia^c Centre for Nursing Studies, Faculty of Health Sciences, Puncak Alam Campus, Universiti Teknologi MARA, Selangor, 42300, Malaysia^d Department of Social and Preventive Medicine, Faculty of Medicine, University of Malaya, Kuala Lumpur, 50603, Malaysia[Full text options](#) [Export](#) [Abstract](#)[Author keywords](#)[SciVal Topics](#)[Metrics](#)**Abstract**

Background: The COVID-19 restrictions and quarantines had led to increased dependence and usage of digital devices for various human activities and internet gaming to the extent of risking vulnerable individuals to develop addiction towards it. Little is known on such risks among populations of nursing students and its impact on their empathy skills or trait. **Objective:** Determining the impact of digital use and internet gaming on empathy of nursing students undergoing remote learning during closure of learning institutions nationwide. **Design:** Cross-sectional online survey was conducted from October to December 2020. **Settings:** Two established public

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Validation of the romanian version of the toronto empathy questionnaire (Teq) among undergraduate medical students

Ursoniu, S. , Serban, C.L. , Giurgi-Oncu, C. (2021) *International Journal of Environmental Research and Public Health*

A validation study of the Korean version of the Toronto empathy questionnaire for the measurement of medical students' empathy

Yeo, S. , Kim, K.-J. (2021) *BMC Medical Education*

Psychometric analysis of the czech version of the toronto empathy questionnaire

Novak, L. , Malinakova, K. , Mikoska, P. (2021) *International Journal of Environmental Research and Public Health*[View all related documents based on references](#)

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institutions located in Malaysia. Participants: A total of 345 nursing students pursuing diploma and bachelor nursing programs. Methods: Toronto Empathy Questionnaire (TEQ), Digital Addiction Scale (DAS) and Internet Gaming Disorder Scale-Short form (IGDS9-SF) were self-administered via Google Form™. Following principal component analysis of TEQ using IBM-SPSS™ (V-27), path analyses was performed using SmartPLS™ (V-3). Results: Despite the increased time spent on digital devices (Δ 2.8 h/day) and internet gaming (Δ 1 h/week) before and during the pandemic, the proportion of high digital users (1.4 %) and gamers (20.9 %) were low; and sizable \approx 75 % had higher-than-normal empathy. Digital-related emotions and overuse of them were associated with lower empathy ($\beta = -0.111, -0.192$; p values < 0.05) and higher callousness ($\beta = 0.181, 0.131$; p values < 0.05); internet gaming addiction predicted callousness ($\beta = 0.265, p < 0.001$) but digital dependence correlated with higher empathy ($\beta = 0.172, p = 0.009$). Conclusions: Digital and internet gaming addiction potentially impact empathy. The negative impact of digital dependence can be attenuated by “digital empathy” – an emerging phenomenon becoming increasingly vital in digital health and communication. © 2022 Elsevier Ltd

Author keywords

Digital empathy ; E-learning; Empathy ; Nursing education

SciVal Topics 

Metrics

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- 1 Internet gaming (2013)
June 2018 American Psychiatric Association
<https://www.psychiatry.org/patients-families/internet-gaming>
-
- 2 Chiorri, C.
Competing factor structures for the toronto empathy questionnaire

(2016) *Psychology and Neurobiology of Empathy*, pp. 399-432. Cited 2 times.
https://www.novapublishers.com/catalog/product_info.php?products_id=57031
ISBN: 978-163484448-2; 978-163484446-8
-
- 3 Dor, A., Mashiach Eizenberg, M., Halperin, O.
Hospital Nurses in Comparison to Community Nurses: Motivation, Empathy, and the Mediating Role of Burnout

(2019) *The Canadian journal of nursing research = Revue canadienne de recherche en sciences infirmieres*, 51 (2), pp. 72-83. Cited 9 times.
doi: 10.1177/0844562118809262

[View at Publisher](#)
-
- 4 Håkansson Eklund, J., Summer Meranius, M.
Toward a consensus on the nature of empathy: A review of reviews (Open Access)

(2021) *Patient Education and Counseling*, 104 (2), pp. 300-307. Cited 19 times.
www.elsevier.com/locate/pateducou
doi: 10.1016/j.pec.2020.08.022

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-
- 5 Fornell, C., Larcker, D.F.
Structural equation models with unobservable variables and measurement error: algebra and statistics
(1981) *J. Mark. Res.*, 18 (3), pp. 382-388. Cited 52597 times.
-
- 6 Ghaus, S., Waheed, M.A., Khan, S.Z., Mustafa, L., Siddique, S., Quershi, A.W.
Effect of COVID-19 Pandemic on the Levels of Empathy among Undergraduate Dental Students in Pakistan
(Open Access)

(2020) *European Journal of Dentistry*, 14, art. no. EJD20101080, pp. S110-S115. Cited 4 times.
<http://www.eurjdent.com/>
doi: 10.1055/s-0040-1722091

View at Publisher
-
- 7 Griffiths, M., Pontes, H.
Internet addiction disorder and internet gaming disorder are not the same
(2014) *Addict. Res. Theory*, 5. Cited 92 times.
-
- 8 Gutiérrez-Puertas, L., Márquez-Hernández, V.V., Gutiérrez-Puertas, V., Granados-Gámez, G., Aguilera-Manrique, G.
Interpersonal communication, empathy, and stress perceived by nursing students who use social networks

(2020) *Journal of Advanced Nursing*, 76 (10), pp. 2610-2617.
[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1365-2648](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1365-2648)
doi: 10.1111/jan.14494

View at Publisher
-
- 9 Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M.
A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)
(2017). Cited 16913 times.
2nd ed. Sage
-
- 10 Henseler, J., Ringle, C.M., Sarstedt, M.
A new criterion for assessing discriminant validity in variance-based structural equation modeling (Open Access)

(2015) *Journal of the Academy of Marketing Science*, 43 (1), pp. 115-135. Cited 8704 times.
<http://www.springer.com/business/journal/11747>
doi: 10.1007/s11747-014-0403-8

View at Publisher
-
- 11 Hoffstädt, H., Stouthard, J., Meijers, M.C., Westendorp, J., Henselmans, I., Spreeuwenberg, P., de Jong, P., (...), van Vliet, L.M.
Patients' and clinicians' perceptions of clinician-expressed empathy in advanced cancer consultations and associations with patient outcomes
(2020) *Palliat. Med. Rep.*, 1 (1), pp. 76-83. Cited 11 times.
-

- 12 Hojat, M., Louis, D.Z., Markham, F.W., Wender, R., Rabinowitz, C., Gonnella, J.S.

Physicians' empathy and clinical outcomes for diabetic patients (Open Access)

(2011) *Academic Medicine*, 86 (3), pp. 359-364. Cited 663 times.
<http://www.lww.com/product/21040-2446>
doi: 10.1097/ACM.0b013e3182086fe1

[View at Publisher](#)

- 13 Hui, B.P.H., Wu, A.M.S., Pun, N.

Disentangling the effects of empathy components on Internet gaming disorder: A study of vulnerable youth in China (Open Access)

(2019) *Journal of Behavioral Addictions*, 8 (1), pp. 181-189. Cited 10 times.
<https://akademai.com/doi/pdf/10.1556/2006.8.2019.12>
doi: 10.1556/2006.8.2019.12

[View at Publisher](#)

- 14 Hunt, P., Denieffe, S., Gooney, M.

Running on empathy: Relationship of empathy to compassion satisfaction and compassion fatigue in cancer healthcare professionals

(2019) *European Journal of Cancer Care*, 28 (5), art. no. e13124. Cited 23 times.
[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1365-2354](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1365-2354)
doi: 10.1111/ecc.13124

[View at Publisher](#)

- 15 Jeon, H.J., Kim, S., Chon, W.-H., Ha, J.H.

Is Internet overuse associated with impaired empathic ability in Korean college students? (Open Access)

(2018) *Medicine (United States)*, 97 (39), art. no. e12493. Cited 6 times.
<https://journals.lww.com/md-journal/pages/default.aspx>
doi: 10.1097/MD.00000000000012493

[View at Publisher](#)

- 16 Jiao, C., Wang, T., Peng, X., Cui, F.

Impaired empathy processing in individuals with internet addiction disorder: An event-related potential study (Open Access)

(2017) *Frontiers in Human Neuroscience*, 11, art. no. 498. Cited 17 times.
<http://journal.frontiersin.org/article/10.3389/fnhum.2017.00498/full>
doi: 10.3389/fnhum.2017.00498

[View at Publisher](#)

- 17 Kesici, A., Tunç, N.F.

The development of the digital addiction scale for the university students: Reliability and validity study (Open Access)

(2018) *Universal Journal of Educational Research*, 6 (1), pp. 91-98. Cited 6 times.
<http://www.hrpub.org/download/20171230/UJER8-19510691.pdf>
doi: 10.13189/ujer.2018.060108

[View at Publisher](#)

-
- 18 Lachmann, B., Sindermann, C., Sariyska, R.Y., Luo, R., Melchers, M.C., Becker, B., Cooper, A.J., (...), Montag, C.
The role of empathy and life satisfaction in internet and smartphone use disorder ([Open Access](#))
- (2018) *Frontiers in Psychology*, 9 (MAR), art. no. 398. Cited 95 times.
<https://www.frontiersin.org/articles/10.3389/fpsyg.2018.00398/full>
doi: 10.3389/fpsyg.2018.00398
- [View at Publisher](#)
-
- 19 Li, Y.-Y., Sun, Y., Meng, S.-Q., Bao, Y.-P., Cheng, J.-L., Chang, X.-W., Ran, M.-S., (...), Shi, J.
Internet Addiction Increases in the General Population During COVID-19: Evidence From China ([Open Access](#))
- (2021) *American Journal on Addictions*, 30 (4), pp. 389-397. Cited 24 times.
[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1521-0391](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1521-0391)
doi: 10.1111/ajad.13156
- [View at Publisher](#)
-
- 20 Mathad, M.D., Pradhan, B., Rajesh, S.K.
Correlates and predictors of resilience among baccalaureate nursing students ([Open Access](#))
- (2017) *Journal of Clinical and Diagnostic Research*, 11 (2), pp. JC05-JC08. Cited 36 times.
[http://www.jcdr.net/articles/PDF/9352/24442_CE\[Ra1\]_F\(GH\)_PF1\(PL_RK\)_PF A\(AK\)_PF2\(P_SY\).pdf](http://www.jcdr.net/articles/PDF/9352/24442_CE[Ra1]_F(GH)_PF1(PL_RK)_PF A(AK)_PF2(P_SY).pdf)
doi: 10.7860/JCDR/2017/24442.9352
- [View at Publisher](#)
-
- 21 Melchers, M., Li, M., Chen, Y., Zhang, W., Montag, C.
Low empathy is associated with problematic use of the Internet: Empirical evidence from China and Germany
- (2015) *Asian Journal of Psychiatry*, 17, pp. 56-60. Cited 42 times.
http://www.elsevier.com/wps/find/journaldescription.cws_home/717029/description#description
doi: 10.1016/j.ajp.2015.06.019
- [View at Publisher](#)
-
- 22 Online gaming addiction (internet gaming disorder)
<http://www.myhealth.gov.my/en/online-gaming-addiction-internet-gaming-disorder/>
-
- 23 Monacis, L., De Palo, V., Griffiths, M.D., Sinatra, M.
Validation of the Internet Gaming Disorder Scale - Short-Form (IGDS9-SF) in an Italian-speaking sample ([Open Access](#))
- (2016) *Journal of Behavioral Addictions*, 5 (4), pp. 683-690. Cited 100 times.
<http://akademai.com/content/122266>
doi: 10.1556/2006.5.2016.083
- [View at Publisher](#)
-

- 24 Novak, L., Malinakova, K., Mikoska, P., van Dijk, J.P., Dechterenko, F., Ptacek, R., Tavel, P.

Psychometric analysis of the czech version of the toronto empathy questionnaire (Open Access)

(2021) *International Journal of Environmental Research and Public Health*, 18 (10), art. no. 5343. Cited 2 times.
<https://www.mdpi.com/1660-4601/18/10/5343/pdf>
doi: 10.3390/ijerph18105343

View at Publisher

- 25 Palansamy, Y.
Higher Education Ministry: all university lectures to be online-only until end 2020, with a few exceptions (2020) . Cited 4 times.
27 May The Malay Mail News
<https://www.malaymail.com/news/malaysia/2020/05/27/higher-education-ministry-all-university-lectures-to-be-online-only-until-e/1869975>

- 26 Pontes, H.M., Griffiths, M.D.
Measuring DSM-5 internet gaming disorder: Development and validation of a short psychometric scale (Open Access)

(2015) *Computers in Human Behavior*, 45, pp. 137-143. Cited 362 times.
doi: 10.1016/j.chb.2014.12.006

View at Publisher

- 27 Rahayu, F.S., Nugroho, L.E., Ferdiana, R., Setyohadi, D.B.
Research trend on the use of it in digital addiction: An investigation using a systematic literature review (Open Access)

(2020) *Future Internet*, 12 (10), art. no. 174, pp. 1-23. Cited 2 times.
<https://www.mdpi.com/1999-5903/12/10/174/pdf>
doi: 10.3390/fi12100174

View at Publisher

- 28 Rovithis, M., Koukouli, S., Fouskis, A., Giannakaki, I., Giakoumaki, K., Linardakis, M., Moudatsou, M., (...), Stavropoulou, A.
Empathy and mobile phone dependence in nursing: A cross-sectional study in a public hospital of the Island of Crete, Greece (Open Access)

(2021) *Healthcare (Switzerland)*, 9 (8), art. no. 975.
<https://www.mdpi.com/2227-9032/9/8/975/pdf>
doi: 10.3390/healthcare9080975

View at Publisher

- 29 Serin, E.K., Durmaz, Y.Ç., Polat, H.T.
Correlation between smartphone addiction and dysfunctional attitudes in nursing/midwifery students

(2019) *Perspectives in Psychiatric Care*, 55 (4), pp. 703-709. Cited 6 times.
[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1744-6163](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1744-6163)
doi: 10.1111/ppc.12406

View at Publisher

- 30 Spreng, R.N., McKinnon, M.C., Mar, R.A., Levine, B.
The Toronto empathy questionnaire: Scale development and initial validation of a factor-analytic solution to multiple empathy measures ([Open Access](#))
- (2009) *Journal of Personality Assessment*, 91 (1), pp. 62-71. Cited 450 times.
<http://www.tandfonline.com/toc/hjpa20/current>
doi: 10.1080/00223890802484381
- [View at Publisher](#)
-
- 31 Suárez-Alvarez, J., Pedrosa, I., Lozano, L.M., García-Cueto, E., Cuesta, M., Muñiz, J.
Using reversed items in likert scales: A questionable practice
- (2018) *Psicothema*, 30 (2), pp. 149-158. Cited 151 times.
<http://www.psicothema.com/pdf/4463.pdf>
doi: 10.7334/psicothema2018.33
- [View at Publisher](#)
-
- 32 Terry, C., Cain, J.
The emerging issue of digital empathy ([Open Access](#))
- (2016) *American Journal of Pharmaceutical Education*, 80 (4), art. no. 58. Cited 39 times.
<http://www.ajpe.org/doi/pdf/10.5688/ajpe80458>
doi: 10.5688/ajpe80458
- [View at Publisher](#)
-
- 33 Definition of addiction
(2019) . Cited 17 times.
Retrieved August 1. 2021 from
<https://www.asam.org/Quality-Science/definition-of-addiction>
-
- 34 Waddimba, A.C., Bennett, M.M., Fresnedo, M., Ledbetter, T.G., Warren, A.M.
Resilience, well-being, and empathy among private practice physicians and advanced practice providers in Texas: a structural equation model study
(2021) *Mayo Clin. Proc. Innov. Qual. Outcomes*, 5 (5), pp. 928-945. Cited 3 times.
-
- 35 International Statistical Classification of Diseases (ICD-11)
(2018) . Cited 2 times.
<https://icd.who.int/browse11/l-m/en#/http://id.who.int/icd/entity/1448597234/mms/unspecified>
-
- 36 Xu, R.H., Wong, E.L.-Y., Lu, S.Y.-J., Zhou, L.-M., Chang, J.-H., Wang, D.
Validation of the Toronto Empathy Questionnaire (TEQ) Among Medical Students in China: Analyses Using Three Psychometric Methods ([Open Access](#))
- (2020) *Frontiers in Psychology*, 11, art. no. 810. Cited 6 times.
<http://www.frontiersin.org/Psychology>
doi: 10.3389/fpsyg.2020.00810
- [View at Publisher](#)
-

- 37 Yeo, S., Kim, K.-J.
A validation study of the Korean version of the Toronto empathy questionnaire for the measurement of medical students' empathy ([Open Access](#))

(2021) *BMC Medical Education*, 21 (1), art. no. 119. Cited 4 times.
<http://www.biomedcentral.com/bmcmededuc/>
doi: 10.1186/s12909-021-02561-7

[View at Publisher](#)

- 38 Zarandona, J., Cariñanos-Ayala, S., Cristóbal-Domínguez, E., Martín-Bezós, J., Yoldi-Mitxelena, A., Hoyos Cillero, I.
With a smartphone in one's pocket: A descriptive cross-sectional study on smartphone use, distraction and restriction policies in nursing students

(2019) *Nurse Education Today*, 82, pp. 67-73. Cited 15 times.
<http://www.sciencedirect.com/science/journal/02606917>
doi: 10.1016/j.nedt.2019.08.001

[View at Publisher](#)

- 39 Zhu, S., Zhuang, Y., Lee, P., Chi-Mei Li, J., Wong, P.W.C.
Leisure and problem gaming behaviors among children and adolescents during school closures caused by covid-19 in hong kong: Quantitative cross-sectional survey study ([Open Access](#))

(2021) *JMIR Serious Games*, 9 (2), art. no. e26808. Cited 33 times.
<https://games.jmir.org/2021/2/e26808/PDF>
doi: 10.2196/26808

[View at Publisher](#)

🔗 Lee, W.L.; Department of Nursing Science, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia; email:wlee@um.edu.my
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