**Appendix 1.0: Evidence sources for the realist review**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr No** | **C No** | **Context** | **Title of the study** | **Authors** | **Year** | **Country** | **Cohort** | **Pedagogical Interventions** |
|  |  | **POOL A-IH\*** | | | | | | |
| 1 | RRA-1A | Context 3 | Integrating Antimicrobial Pharmacology Teaching Using Multidisciplinary Faculty and Diverse Pedagogy Across the Preclinical Curriculum | Laurel Gorman, Jamie Carrizosa, D. Balkwill | 2016 | USA | Undergraduate medical or pharmacy school students | Integrated Anti-microbial pharmacology module |
| 2 | RRA-2A | Context 2 | Modified case based learning: Our experience with a new module for pharmacology undergraduate teaching | Gupta K, Arora S, Kaushal S | 2014 | India | 2nd professional MBBS students | Modified case-based Learning |
| 3 | RRA-3A-A | Context 1 | Pilot study assessing the value of 3D printed molecular modelling tools for pharmacy student education | Hall, S., Grant, G., Arora, D., Karaksha, A., McFarland, A., Lohning, A., & Anoopkumar-Dukie | 2017 | Australia | A tertiary institution in Australia using a third-year cohort of bachelor of pharmaceutical sciences students studying pharmacology. | 3 D printed mol. Modelling tool |
| 4 | RRA-4A | Context 4 | Surveying the experiences and perceptions of undergraduate nursing students of a flipped classroom/drug science | Julie Hanson | 2016 | Australia | Pharmacology course is offered in second-year of the Bachelor of Nursing Science Degree. Undergraduate nursing cohort enrolled in a second-year pharmacology course in 2013 (n= 187) and in 2014 (n =220). | Flipped Classroom |
| 5 | RRA-5A | Context 1 | Effectiveness of 3D visualisation on undergraduate nursing and midwifery students' knowledge and achievement in pharmacology: A mixed methods study | Julie Hanson, P. Andersen, P. Dunn | 2019 | Australia | Two hundred and two second year undergraduate nursing and midwifery students | immersive 3D visualisation teaching approach |
| 6 | RRA-6A | Context 4 | Case-based Learning: Our Experience in Clinical Pharmacology Teaching | A. Hasamnis, A. Arya, S. Patil | 2019 | Malaysia | Year II MBBS students | Case Based Learning |
| 7 | RRA-9A-A | Context 4 | Capstone Course with a Comprehensive and Integrated Review of the Pharmacy Curriculum and Student Assessment as a Preparation for Advanced Pharmacy Practice Experiences | Adina C Hirsch, Harish S Parihar | 2014 | Georgia | Third professional year students of the PharmD curriculum | Capstone Course |
| 8 | RRA-10A | Context 3 | Progressive disclosure cases: The design & evaluation of use in multiple therapeutics courses | Meredith L Howard, Marian L Gaviola | 2018 | USA | Third professional year pharmacy students | Progressive Disclosure Cases (PDC) |
| 9 | RRA-11A | Context 3 | Students’ Perception of an Integrated Approach of Teaching Entire Sequence of Medicinal Chemistry, Pharmacology, and Pharmacotherapeutics Courses in PharmD Curriculum | Mohammed A Islam, Teresa A Schweiger | 2015 | USA | Pharmacy student form second professional (P2) year and continuing until the spring of the third professional (P3) Students from P2 through P4 years completed & returned the 13-item survey | Integrated Course |
| 10 | RRA-12A | Context 2 | The trilayer approach of teaching physiology, pathophysiology, and pharmacology concepts in a first-year pharmacy course: the TLAT model | Mohammed A Islam, Gauri Sabnis, Fred Farris | 2017 | USA | First professional year students of the PharmD program | Tri layer approach of teaching (TLAT) pharmacology |
| 11 | RRA-13A | Context 4 | Prescription Writing in Small Groups as a Clinical Pharmacology Educational Intervention: Perceptions of Preclerkship Medical Students | Henry James, Yasin I Y Tayem, K A J Al Khaja, Sindhan Veeramuthu, Reginald P Sequeira | 2015 | Bahrain | Second-year medical students (n=182) | Prescription Writing Sessions in small group |
| 12 | RRA-14A | Context 4 | An interprofessional collaboration b/w medicine and pharmacy schools: Designing and evaluating a teaching program on practical prescribing | Mohammad Reza Javadi, Mina Khezrian, Anahita Sadeghi, Seyed Hossein Hajimiri, Kaveh Eslami | 2017 | Iran | Mixed Cohort of medical students a) Sophomore. b)Junior. c)Senior | Course as interactive workshops on practical prescribing |
| 13 | RRA-15A | Context 1 | An Educational Board Game to Assist PharmD Students in Learning Autonomic Nervous System Pharmacology | J. Shawn Jones, Lindsay Tincher, Emmanuel Odeng-Otu, Michelle Herdman | 2015 | USA | Pharmacology course of second-year pharmacy students | Education Board Game (Game Based learning) |
| 14 | RRA-19A | Context 4 | Medication safety curriculum: enhancing skills and changing behaviours | Kelly D. Karpa, Lindsay L. Hom, Paul Huffman, Erik B. Lehman, Vernon M. Chinchilli, Paul Haidet & Shou Ling Leong | 2015 | USA | 3rd and 4th year medical students | Medication Safety Curriculum |
| 15 | RRA-20A | Context 2 | Preventing Information Overload: Cognitive Load Theory as an Instructional Framework for Teaching Pharmacology | Sara K Kaylor | 2014 | USA | 96 junior-level baccalaureate nursing students, but the course is divided into two sections, each with approx. 48 students. | UG course based on 'Cognitive Load theory' |
| 16 | RRA-22A | Context 5 | Implementation of the WHO- 6-step method in the medical curriculum to improve pharmacology knowledge and pharmacotherapy skills | Carolina J P W Keijsers, Wieke S Segers, Dick J de Wildt, Jacobus R B J Brouwers, Loes Keijsers, Paul A F Jansen | 2015 | The Netherlands | Medical students from different entry years. | WHO-6-step method as a part of the integrated learning program |
| 17 | RRA-26A | Context 2 | An evaluation of the ‘CRAMPS’ pedagogy in Pharmacology: Perspectives of medical students at the University of Namibia, Pharmacy Education, 2015 | D. Kibuule, S. K. Ilonga, T. Kaisto, M. Adorka, T. Rennie | 2015 | Namibia | Pharmacy and medicine students who had completed a 16-week pharmacology module | CRAMPS pedagogy/teaching tool |
| 18 | RRA-27A | Context 4 | The development and piloting of “ATTEND DR,” a clinical teaching tool to identify and prioritize potential causes of adverse drug reactions | Michelle King, Sohil Khan | 2017 | Australia | Undergraduate Bachelor of Pharmaceutical Science program | ATTEND DR - An acronym-based teaching tool |
| 19 | RRA-28A | Context 4 | Hopefully, I will never forget that again” – sensitizing medical students for drug safety by working on cases and simulating doctor-patient communication | Verena Kirsch, Wencke Johannsen, Christian Thrien, Stefan Herzig, Jan Matthes | 2019 | Germany | One-week course preparing 10th semester medical students for their final practical year | Case scenarios with simulated patients fostering physician-patient conversations |
| 20 | RRA-29A | Context 3 | Structured academic discussions through an online education-specific platform to improve Pharm.D. students learning outcomes | Srikanth Kolluru, James T Varughese | 2017 | USA | Third professional years pharmacy student | Structured academic discussions/Active learning via online platform Piazza |
| 21 | RRA-31A | Context 3 | A Team-based Assignment to Integrate Basic Science and Pharmacotherapeutic Principles for Anticancer Agents | Sonali Kurup, Paiboon Jungsuwadee, Prashant Sakharkar | 2017 | USA | Undergraduate pharmacy Students enrolled in PHAR 636 | Team Based assignment |
| 22 | RRA-35A | Context 1 | A Novel Teaching Tool Combined With Active-Learning to Teach Antimicrobial Spectrum Activity | Conan MacDougall | 2017 | USA | Third professional pharmacy students | Flower Diagram- An active learning approach using novel schematic method |
| 23 | RRA-36A | Context 2 | The Impact of Blended Learning on Student Performance in a Cardiovascular Pharmacotherapy Course | Jacqueline E. McLaughlin, Nastaran Gharkholonarehe, Julia Khanova, Zach M. Deyo, Jo E. Rodgers | 2015 | USA | Second-year pharmacy students enrolled in the doctor of pharmacy (PharmD) program | Blended advanced cardiovascular pharmacotherapy elective course. |
| 24 | RRA-38A | Context 4 | Interprofessional education in pharmacology using high-fidelity simulation | Brittney A.Meyer, Teresa M.Seefeldt, Surachat Ngorsuraches, Lori D.Hendrickx, Paula M. Lubeck, Debra K.Farver, Jodi R.Heins | 2017 | USA | Second-semester nursing students and second-year pharmacy students enrolled in pharmacology courses at South Dakota State University | Interprofessional high-fidelity pharmacology |
|  |  | **POOL B-EO\*** | | | | | | |
| 25 | RRA-1B | Context 2 | Incorporating Team-Based Learning Into a Physician Assistant Clinical Pharmacology Course | Timothy Nguyen, Elaine Wong, Antony Pham | 2016 | USA | PA (Physician Assistant) students in their first year of training | Team Based Learning |
| 26 | RRA-2B | Context 1&4 | The understanding of core pharmacological concepts among health care students in their final semester | Patrik Aronsson, Shirley Booth, Staffan Hägg, Karin Kjellgren, Ann Zetterqvist, Gunnar Tobin and Margareta Reis | 2015 | Sweden | Final year students in the final semester of the medical, nursing and the specialist nursing program | interview study-based study engaging students in two pharmacological clinically relevant written |
| 27 | RRA-4B | Context 4 | Adverse drug reactions reporting by undergraduate medical students in a tertiary care teaching hospital of India: Content and quality analysis in comparison to physician reporting | Parvati B Patel, Tejas K Patel, Snehal Anturlikar , Sahila Khatun, Prakash Bhabhor, Manoj Kumar Saurabh | 2019 | India | 2nd‑year undergraduate medical students of 4th and 5th semester | Comparison of adverse drug reactions (ADRs) reported by medical students and physicians |
| 28 | RRA-5B | Context 2 | Perceptions and Effectiveness of Use of E-Learning in Pharmacology Education | Parvati B. Patel, T. Patel, M. Saurabh, S. Thakkar | 2018 | India | 2nd year MBBS students) | E-Learning Module |
| 29 | RRA-6B | Context 4 | Evaluation of pharmacy students' knowledge and perceptions of pharmacogenetics before and after a simulation activity | Radha V Patel, Melissa Chudow, Teresa T Vo, Erini S Serag-Bolos | 2018 | USA | Third-year students in the four-year doctor of pharmacy (PharmD) program | Pharmacogenetics Simulation Activity |
| 30 | RRA-7B | Context 1 & 2 | The usefulness of crossword puzzle as a self-learning tool in pharmacology | Shilpa Patrick, Kirti Vishwakarma, Vishal P Giri, Debranjan Datta, Priyanka Kumawat, Preeti Singh, Prithpal S Matreja | 2018 | India | Prospective study was conducted among 5th semester students of the second professional MBBS course | Crossword Puzzle (Game Based Learning) |
| 31 | RRA-9B | Context 2 | An Eight-year Retrospective Study in “Flipped” Pharmacokinetics Courses | Adam M. Persky, Robert E. Dupuis | 2014 | USA | Second year professional pharmacy students | Flipped Pharmacokinetics Course |
| 32 | RRA-10B | Context 4 | Improving Dental Students’ Long-Term Retention of Pharmacy Knowledge with “Medication Minutes | Adam M Persky, Michael A Wells, Kimberly A Sanders, Jim Fiordalisi, Christine Downey, Heidi N Anksorus | 2017 | USA | Second-year dental students | Pharmacy generated clinical content in the form of a presentation (Medication Minutes) |
| 33 | RRA-12B | Context 2 | Qualitative Analysis of Student Perceptions Comparing Team-based Learning & Traditional Lecture in a Pharmacotherapeutics Course | Tami L. Remington, Barry E. Bleske, Tracy Bartholomew, Michael P. Dorsch, Sally K. Guthrie, Kristin C. Klein, Jeffrey M. Tingen, Trisha D. Wells | 2017 | USA | Students enrolled were second (P2) and third (P3) year Doctor of Pharmacy students | Team Based Learning Vs Traditional Lecture |
| 34 | RRA-14B | Context 2 | Evaluation of a Flipped Examination Model Implemented in a Final-Year UG Pharmacotherapeutics Course | Maya Saba, Iriny Metry, Cherie Lucas, Bandana Saini | 2019 | Australia | Final-year pharmacy students | Flipped Examination Model |
| 35 | RRA-15B | Context 4 | Impact of Simulation-Enhanced Pharmacology Education in Prelicensure Nursing Education | Jill Steiner Sanko, Mary Mckay | 2017 | USA | students enrolled in pharmacology in an accelerated option bachelor of science in nursing program | Simulation-Enhanced Pharmacology Education |
| 36 | RRA-18B | Context 3 | Integration of Microbiology, Pharmacology, Immunology, and Infectious Disease Using Active Teaching and Self-Directed Learning | Natalie Steinel, Gregory C. Palmer, Emily Nowicki, Ernestine Lee, Elizabeth Nelson, Marvin Whiteley, Michael W. Lee | 2019 | USA | First year Pre-clinical UG medical students | Integrated Curriculum with active teaching and self-directed learning |
| 37 | RRA-19B | Context 2 | Student-led objective tutorials in Pharmacology: An interventional study | Anupama Sukhlecha, Shilpa P. Jadav, Tushar R. Gosai, Divakar Balusamy | 2016 | India | second professional year medical undergraduates. | Comparison of Student-led objective tutorials with Traditional tutorials |
| 38 | RRA-21B | Context 4 | Impact of a compulsory final year medical student curriculum on junior doctor prescribing | J. S. Thomas, M. Koo, S. Shakib, J. Wu, S. Khanal | 2013 | Australia | final year medical student | Compulsory Prescribing Curriculum based on National Inpatient Medication Chart (NIMC) |
| 39 | RRA-22B | Context 5 | The effect of different levels of realism of context learning on the prescribing competencies of medical students during the clinical clerkship in internal medicine: an exploratory study | Jelle Tichelaar, Coen van Kan, Robert J van Unen, Anton J Schneider, Michiel A van Agtmael, Theo P G M de Vries, Milan C Richir | 2014 | The Netherlands | randomly selected medical students who did their clinical clerkship in internal medicine | Treatment plan formulation in three increasingly realistic situations |
| 40 | RRA-23B-A | Context 4 | ‘SMART’ way to determine treatment goals in pharmacotherapy education | Jelle Tichelaar, Sjoerd H Uil den, Ninja F Antonini, Michiel A van Agtmael, Theo P G M de Vries, Milan C Richir | 2016 | The Netherlands | second year medical students | Comparison of Treatment plan devised by WHO and SMART group |
| 41 | RRA-24B | Context 4 | Simulation in an Undergraduate Nursing Pharma. Course: A Pilot Study | Elizabeth Tinnon, Rebecca Newton | 2017 | USA | 24 undergraduate nursing pharmacology students | Pharmacology Simulation Course |
| 42 | RRA-25B | Context 4 | Practical prescribing course: a student evaluation | Vicky Tittle, David Randall, Vidhya Maheswaran, Andrew Webb, Simon Quantrill, Michael Roberts | 2014 | UK | Final year medical students | Practical Prescribing Course |
| 43 | RRA-26B | Context 2 | Impact of Student- Versus Instructor-Directed Case Discussions on Student Performance in a Pharmacotherapy Capstone Course | Jennifer M Trujillo, Joseph J Saseen, Sunny A Linnebur, Laura M Borgelt, Brian A Hemstreet, Douglas N Fish | 2014 | USA | second semester, third year of the PharmD students | Pharmacotherapy Capstone Course |
| 44 | RRA-27B | Context 4 | Evaluating the Use of a Simulated Electronic Health record and Online Drug Reference in a Case Study to Enhance Nursing Students’ Understanding of Pharmacologic Concepts & Resources | Kimberly D Vana, Graciela E Silva | 2014 | USA | 3 junior-level, baccalaureate, prelicensure, nursing pharmacology students | Simulated Electronic Health Record |
| 45 | RRA-28B | Context 2 | Pharmacy Students’ Performance and Perceptions in a Flipped Teaching Pilot on Cardiac Arrhythmias | Terri H Wong, Eric J Ip, Ingrid Lopes, Vanishree Rajagopalan | 2014 | USA | First year pharmacy students | Flipped Teaching |
| 46 | RRA-29B | Context 3 | Effectiveness of integrated teaching module in pharmacology among medical undergraduates | Preeti P Yadav, Mayur Chaudhary, Jayshree Patel, Aashal Shah, N D Kantharia | 2016 | India | 2nd year MBBS students | Integrated Teaching Module |
| 47 | RRA-30B | Context 2 | Using Mind Maps to Improve Medical Student Performance in a Pharmacology Course at Kunming Medical University | Guo Ying, Xie Jianping, Luo Haiyun, Li Xia, Yang Jianyu, Xuan Qun, Yu Jianyun | 2017 | China | third year undergraduate medical students, | Mind Maps |
| 48 | RRA-31B | Context 1 | ADAM, a hands-on patient simulator for teaching principles of drug disposition and compartmental pharmacokinetics | Ines Zuna, Andrew Holt | 2017 | Canada | 3rd-year experimental course for undergraduate pharmacology students | ADAM-Patient Simulator |
|  |  | **POOL C-RT\*** | | | | | | |
| 49 | RRA-1C | Context 4 | A Time management intervention using simulation to improve nursing students’ preparedness for medication administration in theclinical setting: A quasi-experimental study | Christina Aggar, J. Bloomfield, Astrid Frotjold, T. Thomas, F. Koo | 2017 | Australia | Second year university nursing students | Time management intervention using simulation-for drug administration |
| 50 | RRA-2C | Context 2 | Use of prelecture assignment to enhance learning in pharmacology lectures for the 2nd year medical students | Marya Ahsan, Ayaz Khurram Mallick | 2016 | India | undergraduate medical students in their 2nd year of their professional course. | Prelecture Assignment |
| 51 | RRA-3C | Context 1 | Learning a complex dose–response relationship with the computer simulation CoaguSim | Hesham Al-Sallami, Swee-Kin Loke | 2018 | New Zealand | final year bachelor of pharmacy (BPharm) students | Computer simulation of coagulation (CoaguSim) |
| 52 | RRA-4C | Context 3 | Impact of Integrated Teaching Sessions for Comprehensive Learning & Rational Pharmacotherapeutics for Medical Undergraduates | Sneha Ambwani, Bhavisha Vegada, Rimple Sidhu, Jaykaran Charan | 2017 | India | Second year MBBS students | Integrated Teaching Sessions |
| 53 | RRA-6C | Context 2 | Effectiveness of student‑led objective tutorials in pharmacology teaching to medical students | Kriti Arora, Nayana Kamalnayan Hashilkar | 2016 | India | 2nd professional students of pharmacology | Student-led Objective Tutorials |
| 54 | RRA-7C | Context 3 | Integrating a New Medicinal Chemistry and Pharmacology Course Sequence into the PharmD Curriculum | Mustapha Beleh, Melanie Engels, George Garcia | 2015 | USA | PharmD program students | integrated medicinal chemistry/pharmacology course |
| 55 | RRA-8C | Context 2 | Simulated patient cases using DecisionSim improves student performance and satisfaction in pharmacotherapeutics education | Nijole Bernaitis, Lyndsee Baumann-Birkbeck, Sean Alcorn, Michael Powell, Devinder Arora, Shailendra Anoopkumar-Dukie | 2018 | Australia | final year of Bachelor of Pharmacy | Simulated patient cases using DecisionSim technology |
| 56 | RRA-10C | Context 4 | Self-Reported Confidence in Prescribing Skills Correlates Poorly With Assessed Competence in Fourth-Year Medical Students | David J Brinkman, Jelle Tichelaar, Michiel A van Agtmael, Theo P G M de Vries, Milan C Richir | 2015 | The Netherlands | Fourth-year medical students | Comparison of students self-reported confidence and their objectively assessed competence in Prescribing skills |
| 57 | RRA-12C | Context 1 | Fun With Pharmacology: Winning Students Over With Kahoot! Game-Based Learning | Susan G Bryant, Jennifer M Correll, Brandy M Clarke | 2018 | USA | 32 second-semester Associate Degree Nursing Students | Kahoot-Game Based learning |
| 58 | RRA-14C | Context 1 | Implementing a strategy for promoting long-term meaningful learning in a pharmacokinetics course | Patrick Chan, Sarah Kim, Linda Garavalia, Jeffrey Wang | 2018 | USA | First year pharmacy students | Authentic Learning-Pharmacokinetics course |
| 59 | RRA-15C | Context 2 | Let’s ‘Play’ with Molecular Pharmacology | Supriyo Choudhury, Richeek Pradhan, Gairik Sengupta, Manisha Das, Manojit Chatterjee, Ranendra Kumar Roy, Suparna Chatterjee | 2015 | India | fourth semester class for undergraduate medical students | Role-play in Molecular Pharmacology |
| 60 | RRA-16C | Context 4 | Virtual Electronic Health Record Technology with Simulation-Based Learning in an Acute Care Pharmacotherapy Course | James C Coons, Lawrence Kobulinsky, Deborah Farkas, John Lutz, Amy L Seybert | 2018 | USA | second professional year of the Pharm.D. curriculum | Virtual EHR with patient simulation for a Pharmacotherapy course |
| 61 | RRA-17C | Context 4 | Interprofessional Pharmacokinetics Simulation: Pharmacy and Nursing Students’ Perceptions | Cheryl D Cropp, Jennifer Beall, Ellen Buckner, Frankie Wallis, Amanda Barron | 2018 | USA | senior undergraduate nursing and second-year pharmacy students | Interprofessional Pharmacokinetics Simulation |
| 62 | RRA-18C | Context 1 | The bus analogy’: A new analogy to help pharmacy students conceptualize the well-stirred model | Renée Dagenais, Arden R Barry, Mary H H Ensom | 2017 | Canada | 52 third- and fourth-year entry-to-practice pharmacy students. | Bus Analogy as a Well-stirred model for Pharmacokinetics Learning |
| 63 | RRA-19C | Context 4 | Using simplistic simulations to enhance learning in a nephrology pharmacotherapeutics module | Yen H Dang | 2017 | USA | Second year pharmacy students participated | Simplistic simulations for a nephrology pharmacotherapeutics module |
| 64 | RRA-22C | Context 4 | Nursing students learning the pharmacology of diabetes mellitus with complexity-based computerized models: A quasi-experimental study | Ilana Dubovi, Efrat Dagan, Ola Sader Mazbar, Laila Nassar, Sharona T Levy | 2018 | Israel | Participants included volunteer sophomore nursing students | Pharmacology Inter-Leaved Learning- Cells (PILL) Computer based model |
| 65 | RRA-23C | Context 2 | Blended learning for reinforcing dental pharmacology in the clinical years: A qualitative analysis | Prashanti Eachempati, K S Kiran Kumar, K N Sumanth | 2016 | Malaysia | 3rd and 4th year BDS students. | Blended Learning |
| 66 | RRA-26C | Context 3 | PHARMAVIRTUA: educational software for teaching and learning basic pharmacology | Antonio Augusto Fidalgo-Neto, Anael Viana Pinto Alberto, André Gustavo Calvano Bonavita, Rômulo José Soares Bezerra, Felipe Faria Berçot, Renato Matos Lopes, Luiz Anastacio Alves | 2014 | Brazil | undergraduate students from the biological and health fields (medicine, pharmacy, or biomedical science) | Use of educational Software-PHARMAVIRTUA |
| 67 | RRA-28C | Context 4 | Experience with the script concordance test to develop clinical reasoning skills in pharmacy students | Kylee A Funk, Claire Kolar, Sarah K Schweiss, Jeffrey M Tingen, Kristin K Janke | 2017 | USA | Pharmacy students from second semester of the second year | Script concordance test activity |
| 68 | RRA-30C | Context 2 | Interactive E-learning module in pharmacology: a pilot project at a rural medical college in India | Nitin Gaikwad, Suresh Tankhiwale | 2013 | India | fourth-semester students of the second professionals course (II MBBS), | Interactive E-learning Module |
| 69 | RRA-31C | Context 2 | An Effective Approach to Teaching Pharmacogenomics in the First Year of Pharmacy Curriculum | Marina Gálvez-Peralta, Grazyna D Szklarz, Werner J Geldenhuys, Paul R Lockman | 2018 | USA | Students in spring semester of the first year (P1) of the 4-year PharmD professional program | Newly revised Pharmacogenomics course- with series of active learning strategies |
| 70 | RRA-32C | Context 1 | Learning how to learn: Meta-learning strategies for the challenges of learning pharmacology | Suzanne Alton | 2016 | USA | Third-year nursing students in an undergraduate nursing program. | Meta-learning strategies implemented through homework assignments |
|  |  | **ADDITIONAL RECORDS** | | | | | | |
| 71 | RRA-1GL | Context 2 | Effectiveness of Instructional Design to Contextualize Pharmacology for Nursing Students (PhD Dissertation) I University of Kansas Medical Center | Kim J. Tankel | 2015 | USA | UG nursing students in a Bachelor of Science in Nursing (BSN) accelerated program. | Use of of a board game Review and Competency Evaluation (RACE©) for cognitive load management |
| 72 | RRA-5GL | Context 1 & 2 | Using an “Escape Room” toolbox approach to enhance pharmacology education | Melinda Hermanns, Belinda joy Deal, Ann M. Campbell, Shawn Hillhouse, J. Brian Opella, Casey Faigle, Robert H. Campbell | 2017 | USA | First Semester nursing students | Escape Room Toolbox |
| 73 | RRA-6GL | Context 1 | Integration of Graphic medicine in teaching Pharmacology to Optometry students | Faraz Khurshid, Babu Noushad | 2017 | Oman | Undergraduate students of optometry in semesters five and six. | Graphic Medicine |
| 74 | RRA-7GL | Context 1 | Concept Animation - a potential instructional scaffolding | Khurshid Faraz, Noushad Babu, Spanjers Ingrid, Al-Darwashi Jamila | 2018 | Oman | Undergraduate students of optometry in semesters five and six. | Concept Animation |
| 75 | RRA-8GL | Context 2 | Nursing Students’ Academic Performance With Flipped Classroom Pedagogy In Nursing Pharmacology (PhD Dissertation) | Nadine r. Sirota, Margaret l. Rice, Angela Benson, Karl Hamner, Alice March, Robert Mayben | 2017 | USA | Undergraduate associate degree nursing students | Flipped classroom |

*\* The primary author (FK) categorized the selected articles into three distinct pools, which are indicated by the initials of each co-author in the appendix. Each co-author was assigned to review the articles in their respective pool.*