HBSRA Conference Proceedings 2022

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HBSRA Full Name: Healthcare & Biological Sciences Research Association

Address: - B-305 South Block Eurasia Research World Trade Park, Malviya Nagar Jaipur, India

E-mail: convener@eurasiaresearch.info Conference website-

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Table of Content:

Healthcare and Biological Sciences Research Association (HBSRA) is an international community of researchers, practitioners, students, andprofessionals for the development and spread of ideas in the field of healthcare and life sciences.

HBSRA is promoted by Eurasia Research. HBSRA aims to bring together worldwide researchers and professionals, encourage intellectual development, and create opportunities for networking and collaboration. These objectives are achieved through academic networking, meetings, conferences, workshops, projects, research publications, academic awards,and scholarships.

The driving force behind this association is its diverse members and advisory board, who provide inspiration, ideas, efforts and drive collaborations. Scholars, Researchers, Professionals are invited to become a member of HBSRA and join this ever-growing network, working for benefit of society and research with the spirit of sharing and mutual growth.

Salient Features:

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Preface:

Healthcare and Biological Sciences Research Association (HBSRA) is an international forum of researchers, academicians, and practitioners for sharing knowledge and innovation in the field of healthcare and life sciences. HBSRA aims to bring together worldwide researchers and professionals, encourage intellectual development, and providing opportunities for networking and collaboration. This association meets its objectives through academic networking, meetings, conferences, workshops, projects, research publications, academic awards, and scholarships. HBSRA strives to enrich its diverse group of advisory members. Scholars, Researchers, Professionals are invited to freely join HBSRA and become a part of a diverse academic community, working for benefit of academia and society through collaboration and vision.

For this conference around 20 Participants from around 7different countries have submitted their entries for review and presentation.

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Our mission is to make continuous efforts in transforming the lives of people around the world through education, application of research & innovative ideas.

Editor: Dr. Davis Lazarus

Publication Process:

All accepted original research papers in the English Language will be published in selected journals as per the publication policy, as available on the conference website. Once you receive the Invitation/ Acceptance letter,that means your full paper is also accepted for publication in an International Journal, if you follow the communicated editorial instructions/ guidelines.

The journal publication will be peer-reviewed, checked for plagiarism, indexed, archived, open access, referenced by CrossRef and will carry ISSN number and DOI.

Even if your full paper is not yet ready, you may participate in the desired conference with your abstract. The abstract must contain the following:

Article Title
Full Names/ Emails/ Affiliations of the authorsAbstract in 100-300 words
3-7 Keywords
You may update your submitted abstract/ title/ co-authors/ submit your full-paper on a later stage (before the conference).

You may submit your full original paper for publication in the conference journal, when it is complete, till the conference date. The last date of submission is the conference day itself. While submitting the full paper, please provide the following in the email:

Full paper in MS Word format. (Ideally, a research paper should be 2500-3000 words).
Details of 2 reviewers with their names, affiliations, contact numbers and email IDs (If possible, send two emailsfor each reviewer).
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We follow the following steps for publication in our associated International Journals. The publication processtakes around 70 days, starting from the end of the conference.

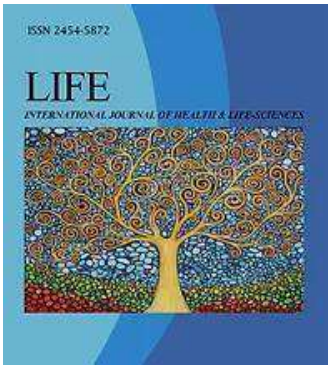
A list of registered papers is sent to all the participants of the conference within a week's time after the conference. Please see, if your paper is included in the list. If not, please write back to us for inclusion. This list would also mention for any deficiency/incompleteness found in the submitted paper. You would be given 10 days to return your complete papers/ required information.
After this, the editorial team would send all complete papers for review (usually 5-7 reviewers). The review process takes around 30 days.
Following this, our editor would send the editorial comments/ suggestions to the corresponding author. Please improve the paper as indicated in the review and send it back to us within 10 days.
If the paper received is complete in all regards as per the comments/ suggestions, it would be sent for final publication, else we would send it again to you and finally, 5 days would be given to you for its improvement. Finally, the paper is published and the authors are informed about the published paper by email, which contains the paper URL, DOI, Citation, and other related information.
If you fail to meet the deadlines/ correct the paper as per review comments, the paper may be rejected or it will be postponed for publication in the next issue. Normally, the entire process takes around 70 days.

Authors may request the conference secretariat for withdrawing their paper, for publishing it elsewhere (in the journal of their choice). In such cases, the requested papers are removed from the publication process. The withdrawal requests may be given to the conference secretariat before the commencement of the publication process (7 days after the conference).

Acknowledgements

Our sincere thanks go to our outstanding supporters who made this great and interesting conference possible.

Publishing



HBSRA Institutional Members

Some special thanks go to our outstanding Key-Note speakers, not only for their inspiring and highly interesting presentations but also for their input and contributions in the discussions andQ&A sessions during the conference:

KEYNOTE SPEAKERS 2022

Topic: What COVID-19 Revealed About Significant Personal Experience – And 4 Ways to Rethink Mental Health Problems

Ph.D. Agnieszka Iłendo-Milewska is a psychologist, a certified coach, and a career counselor. She is a university professor and a head of the Faculty of Psychology at the Private University of Pedagogy in Bialystok, Poland. She is a head person and founder of the Private Primary School in Bialystok and a head person of the Private Preschool in Bialystok. She is also an expert at the Ministry of National Education in Warsaw. Her major research interests include self-regulation, dysfunctional behavior, and social relation. Her scientist project is concentrating on 'Self-regulation among middle school students and 'Emotions and relationships between groups. She is also an Editorial Board Member of Social Science and Humanities Research Association (SSHRA), Journal Humanities and Social Sciences (HSS), PEOPLE Journal: International Journal of Social Sciences, and International Journal of English Literature and Social Sciences (IJELS). She acts as an Honorary Peer Reviewer for the Global Association of Research USA. She has published widely in Polish and English. She has authored several books: 'School environment in the students' experiences, tendencies of changes (2016) and 'Dysfunction among middle school students (2009). She was awarded the Medal of the Commission of National Education in Poland for exceptional services to education and upbringing (2017), Medal Diligentiae for urgency and good posture, granted by the President of the City of Białystok (2018), Award of the Ministry of National Education for outstanding achievements in didactic and educational work (2019).

Dr. Agnieszka Iłendo-MilewskaDepartment of Psychology,
The Private University of Pedagogy in Bialystok,Poland

Topic: Classification, Segmentation and Characterization of Brain Tumor in MRI Images Using Machine Learning Scheme

Norma Alias is currently the Head of Networking and Linkages Division, Associate Professor and Research Fellow of Center for Sustainable Nanomaterials, Ibnu Sina Institute for Scientific and Industrial Research (IIS), Universiti Teknologi Malaysia (UTM). She was appointed as an Associate Professor and Research Fellow at King Saud University, Saudi Arabia. She is a member of the Malaysian Mathematical Sciences Society. AP Dr. Norma possessed a PhD degree in Industrial Computing (Parallel Computing) in 2004. She has a diverse field of specializations including mathematical modeling, big data simulation, industrial computing, scientific computing, high performance computing, shared-distributed parallel computing system, grid computing and software development. She has supervised for 13 PhD students and 32 MSc with Philosophy. She is supervising ongoing 5 PhD students, 12 MSc with Philosophy students, 2 postdoctoral students and reviewing post graduate students of local and international universities from multi-faculty such as Computing Faculty, Science Faculty, Sport Science Research Center, Faculty of Biomedical and Health Science Engineering, UTM, UITM, UMS, USM,Malaysia, Curtin University, Australia and Gomal University, Pakistan. AP Dr. Norma has a distinguished academic and research track record having published over 200 publications which consist of index journal, index proceedings articles, books and modules. She held a number of editorial board memberships for a few international and national journals, such as Matrix Science Mathematics (as Editor-in-Chief), Recent Research in Knowledge and Information System, Malaysian Journal of Fundamental and Applied Sciences, World Journal of Advanced Engineering and Technology, International Journal of Advanced Information in Arts Science and Management, and International Journal of Advanced Research in Applied Science and Technology. AP Dr. Norma is an active innovator, having earned 2 product patent disclosures in 2015, 4 Intellectual property declarations, and 16 medals won in product innovation and invention expo since 2004 and having 2 products for commercialization. With her extensive experience in innovation and invention, she has been entrusted with conducting innovation and creativity courses at university level,

therefore, the innovation and creativity can be delivered in the form of structured knowledge. She also has extensive experience in service-based commercialization activities. In 2007 to 2018, she has a number of service-based commercialization products in term of software services, workshop, training, conferences, seminar and consultation. Since 2016, the commercialization has been run under CSNano Technology Sdn Bhd, IIS, UTM.

Professor Dr. Hjh. Norma Binti Alias
Ibnu Sina Institute for Fundamental Science Studies,81310 Technology University of Malaysia,
Skudai, Johor, Malaysia

Topic: Work Engagement and Work-Family Interface; Which One Is More Influential on Nurses' Intention to Leave Work?

Dr. Yoshiko Yamaguchi has received her Ph.D. at. Kyushu University during the period of 2013-2016. Currently, she is working as a research associate in Home Care Nursing, at the Faculty of Nursing, Kwassui Women's University, Japan. She has successfully completed her responsibilities as a reviewer of eighty-one research articles in twenty- four journals from 2016-present. And she has been serving as an editorial board member of two journals; LIFE: International Journal of Health and Life-Sciences and Journal of Practical and Professional Nursing and has been delegated vice president of the Healthcare and Biological Sciences Research Association (HBSRA).

Dr. Yoshiko YamaguchiHome Care Nursing, Faculty of Nursing,
Kwassui Women's University, Japan

Topic: Why Autobiographical Memories Is Crucial to Recognise Personal Experience Related to The Pandemic Covid 19?

PhD Agnieszka Iłendo-Milewska is a psychologist, a certified coach and career counselor. She is a university professor and a head of the Faculty of Psychology at the Private University of Pedagogy in Bialystok, in Poland. She is a head person and founder of the Private Primary School in Bialystok. She is also an expert at the Ministry of National Education in Warsaw. She has a certificate in Child and Adolescent Psychoanalytic Psychotherapy. She is in training in Couple Psychoanalytic Psychotherapy. Her major research interests include the self-regulation, dysfunctional behavior and social relation. Her scientist's project is concentrating on 'Self-regulation among middle school students' and 'Emotions and relationships between groups'. She is also an Editorial Board Member of Social Science and Humanities Research Association (SSHRA), Journal Humanities and Social Sciences (HSS), PEOPLE Journal: International Journal of Social Sciences and International Journal of English Literature and Social Sciences (IJELS). She acts as an Honorary Peer Reviewer for Global Association of Research USA. She has published widely in Polish and English. She has authored several books: 'School environment in the students' experiences, tendencies of changes' (2016) and 'Dysfunction among middle school students' (2009). She awarded the Medal of the Commission of National Education in Poland for exceptional services to the education and upbringing (2017), Medal Diligentiae for urgency and good posture, granted by the President of the City of Białystok (2018), Award of the Ministry of National Education for outstanding achievements in didactic and educational work (2019).

Dr Agnieszka Iłendo-Milewska
Professor and a head of the Faculty of Psychology at the Private University of Pedagogy in
Bialystok, Poland

Presenters

Promising Activity of Tetrahydroisoquinolines Against Multidrug-Resistant Clinical Salmonella Isolates and Cytotoxicity Against Monkey Kidney Cells

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Stephen M. Ghogomu
Department of Biochemistry and Molecular Biology, Faculty of Science, University of Buea, South West Region, Cameroon

James A. Mbah
Department of Chemistry, Faculty of Science, University of Buea, Cameroon

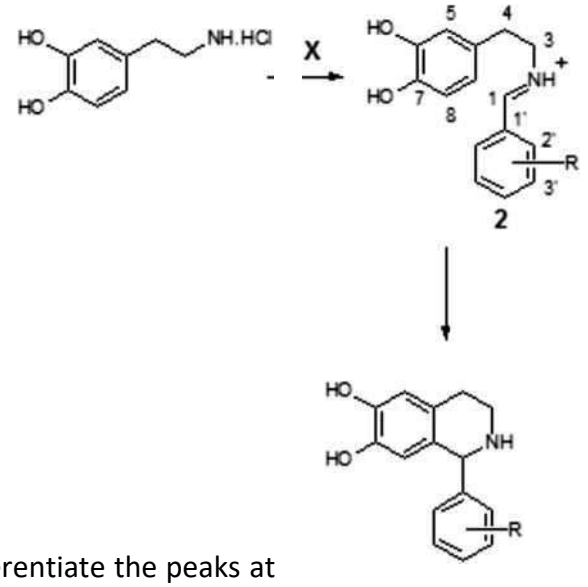
Abstract: The high burden of Salmonella infections has been aggravated by the emergence and spread of multidrug-resistant strains affecting almost all antibiotic classes recommended for treatment. Several tetrahydroisoquinolines, both natural and synthetic, are important pharmaceuticals for a wide range of pathologies. Medicinal chemistry exploration of the tetrahydroisoquinoline scaffold has yielded analogues with considerable antimicrobial activity against bacteria, viruses, and fungi, amongst other pharmacological properties. We report here on a series of seventeen tetrahydroisoquinoline analogues of Dioncophyllines that were synthesized and screened against multidrug-resistant strains of Salmonella using standard methods. The cytotoxicity of selected compounds was assessed. Two compounds, 3b and 3n, were found to have activity, presenting zones of inhibition > 20 mm and the best minimum inhibitory concentration (MIC) of 16 pg/mL), comparable to current anti¬Salmonella drugs. Furthermore, most MBC:MIC ratios were < 4 which may indicate bac¬tericidal activity. However, toxicity against monkey

kidney cells was shown to be highly dependant on the substituent group. Further medicinal chemistry exploration based on active structures may yield a highly active antibacterial lead.

Introduction: Salmonella infections are a major cause of morbidity and mortality in humans. Each year, an estimated 1.3 billion cases resulting to about 3 million deaths occur worldwide due to salmonellosis [1]. Several pathogenic strains exist, some of which may cause serious complications such as intestinal perforations and haemorrhage, miscarriage in pregnancy and carriers. Salmonella enterica serovar Typhi, Paratyphi A,Paratyphi B, and Paratyphi C may be referred to collectively as ty- phoidal Salmonella.They are human host-restricted organisms that cause typhoid fever and paratyphoid fever together re¬ferred to as enteric fever, whereas other serovars are grouped as non-typhoidal Salmonella (NTS) [2] Current vaccination uses oral typhoid vaccines Typhim Vi and Ty21a, which unfortunately display low efficacy amongst other limitations [3] For several decades, also penicillin, cephalosporin, antifolate, phenicol, quinolone and macrolide antibiotics are applied in treatment [4]. However, antimicrobial resistance is presently a global concern due to resistant strains of Salmonella species that have emerged [5,6] showing high rates of resistance to current antibiotics. Specifically, antimicrobial resistance has emerged in Salmonella enterica, initially to the traditional first-line drugs chloramphenicol, ampicillin, and trimethoprim¬sulfamethoxazole [4]. Furthermore, genetic resistance of Salmonella species against the fluoroquinolones was reported in decreased susceptibility and treatment failure [7]. Thus, increasing Anti-Salmonella resistance justifies the search for new efficacious drugs. Presently, several strategies are employed in the discovery of antibacterials including screening of synthetic compounds derived from medicinal chemistry. Notably, tetrahydroisoquinolines (THIQs) occurring widely in nature as well as their semi-synthetic and synthetic derivatives are pharmaceuticals possessing a broad range of bioactivity [8]. The tetrahydroiso¬quinoline structural moiety is a frequent nitrogen heterocycle in approved drugs with efficacy against a wide range of pathologies. Medicinal chemistry exploration of this scaffold has yielded analogues with application in cardiovascular, cen¬tral nervous system, inflammatory, endocrine, metabolic, and infectious diseases covering antitubercular, antibacterial, anti¬fungal, antiviral action [9]. In this study, we report the antibacterial activity of a synthetic series of 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline analogues against resistant clinical strains of Salmonella using a cell-based screening [10].

Materials and methods: Materials: The synthesis of organic compounds was carried out with commercially available chemicals that were used as received (Scheme 1). 3,4-dihydroxyphenethylamine hydrochloride, triethylamine, ethanol, benzaldehyde, and its derivatives were pur¬chased from Sigma Aldrich Chemical Company, St. Louis, U.S.A. All solvents were removed under reduced pressure using a rotary evaporator. Thin Layer Chromatography (TLC) analyses were carried out on aluminium plates (Merck) precoated with silica gel 60 F254 (0.2 mm thickness) purchased from Sigma Aldrich Chemical Company. Visualization of spots was performed with UV light. The 1H NMR spectra were measured on a UNITYplus - 500 spectrometer (1H NMR at 500 MHz). Chemical shifts 8 are denoted in units of parts per million (ppm) relative to the solvent (1H NMR peak: 53.30 for MeOD) with tetram¬ethylsilane (TMS, 80.00) as an internal standard. Resonances were designated as singlet (s), doublet (d), or multiplet (m). Mass spectra were recorded on a BIOTO FIIEST mass spectrometer.

Synthesis: general procedures for the synthesis of 6,7-dihydroxy- 1,2,3,4-tetrahydroisoquinoline analogues 3 a-q. The synthesis was elaborated as shown in Scheme 1 below following the previously reported method [11]. A mixture of 3,4-dihydroxyphenethylamine hydrochloride (compound 1, 1 equiv), substituted benzaldehydes (1equiv), and triethylamine (1 mL) in ethanol (10 mL) was stirred, heated under reflux for 6-10 h and concentrated to remove the solvent. The residue obtained after evaporation was diluted with methylene chloride (CH2Cl2, 100 mL) and distilled water (100 mL) with the resulting precipitation of a solid. The solid was collected by filtration, washed with acetone (3 x 10 mL), and air-dried to afford (3a-q) as solid [12-14]. 1-1-(2,4-dichlorophenyl)- 6,7-dihydroxy- 1,2,3,4-tetrahydroisoquinoline (3a): The yield [from 3,4-dihydroxyphenethylamine hydrochloride (1.0 g, 5.27 mmol), 2,4-dichlorobenzaldehyde (0.95 g, 5.27 mmol)], (1.68 g, 92%); mp, 135-136 °C, was submitted to detailed analysis of]H NMR spectra



(MeOD) allowing to differentiate the peaks at 8 2.69-2.93 (m, 4H, -(CH2)2), 8 5.19 (s, 1H, -CH-N), 8 6.30-7.16 (m, 5H, aryl-H). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 15 carbon signals into 2 methylenes (8 27.66 and 40.34), 1 methine (8 56.02), 5 olefinicmethines (8 114.18, 114.93, 128.82, 130.65, and 132.01), 3 olefinic quaternary carbons (8 126.76, 140.41,141.85), 2 chloro-olefinic quaternary carbons (8 133.38 and 134.51) and 2 hydroxy-olefinic quaternary carbons (8 143.49 and 149.06). MS: m/z [M + H]+ 310.0385 corresponding to CBHBNO]^. 1-(4-chlorophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3b): The yield [from 3,4-dihydroxyphenethylamine hydrochloride (1.0 g, 5.27 mmol), 4-chlorobenzaldehyde (0,8 g, 5.27 mmol)], (1.286 g, 78%); mp, 118 - 120 °C, was submitted to detailed analysis of] H NMR spectra (MeOD) allowing to differentiate the peaks at 8 2.75-3.26 (m, 4H,-(CH2)2), 8 5.11 (s, 1H, -CH-N), 8 6.14-7.38 (m, 6H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 15 carbon signals into 2 methylenes (8 28.66 and 40.34), 1 methine (8 57.02), 6 olefinic methines (8 114.18, 114.93, 128.52 (2) and 130.05 (2)), 3 olefinic quaternary carbons (8 126.76, 139.41,140.85), 1 chloro-olefinic quaternary carbons (8 131.88) and 2 hydroxy-olefinic quaternary carbons (8 143.49 and 149.06). MS [M + H]+ 276.0787 corresponding to C15H14NO2CL

3a-R = Z,<-a 3b-R = 4-Cl

3d-R = 3',4-Cl 3e-R = 2-Br 3f-R =?-Br 3g-R = 4-Br 3h-R = 2-F 3i-R = 3-F 3j-R = 4-F 3k-R = 3-NO_2 31-R = 4-NO_2 3m-R = 4'-CH_3 3n - R = 4-CF3 30-R = 4-OCH_3 3p - R = 4-Phenyl 3q-R = 4-Cl, 3-N

Reagents: X= Benzaldehyde or substituted benzaldehyde, triethylamine and ethanol, reflux

Scheme 1. Synthesis of 1-aryl-6,7-dihydroxy-1,2,3,4- tetrahydroisoquinolineanalogues.

1-(3-chlorophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3c): Yield [from 3,4-dihydroxyphenethylamine (1.0 g, 5.27 mmol) and 3-chlorobenzaldehyde (0.8 g, 5.27 mmol)], 1.2 g (72%); mp, 138-140 °C, was submitted to detailed analysis of 1H NMR spectra (MeOD) allowing to differentiate the peaks at 8 2.90¬3.21 (m, 4H, -(CH2)2), 8 5.47 (s, 1H, -CH-N), 8 6.17-7.62 (m, 6H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 15 carbon signals into 2 methylenes (8 26.47 and 40.16), 1 methine (8 58.83), 6 olefinicmethines (8 114.39, 114.71, 125.44, 127.79, 128.97, and 131.02), 3 olefinic quaternary carbons (8 129.98, 139.62, 144.49), 1 chloro-olefinic quaternary carbons (8 134.59) and 2 hydroxy-olefinic quaternary carbons (8 145.78 and 147.92). MS: m/z [M + H] + 276.0775 corresponding to C^H^OsCl. 1-(3,4-dichlorophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3d): Yield [from 3,4-dihyroxyphenethylamine (1.0 g, 5.27 mmol) and 3,4-dichlorobenzaldehyde (0.95 g, 5.27 mmol)], 1.1 g (60%); mp, 136-137 °C,was submitted to detailed analysis of]H NMR spectra (MeOD) allowing to differentiate the peaks at 8 2.92-3.22 (m, 4H, -(ϖ2)2), 8 5.52 (s, 1H, -CH-N), 8 6.17-7.81 (m, 5H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 15 carbon signals into 2 methylenes (8 26.45 and 40.12), 1 methine (8 58.45), 5 olefinicmethines (8 114.18, 114.75, 128.90, 130.97, and 132.81), 3 olefinic quaternary carbons (8 129.77, 138.1, 141.11), 2 chloro-olefinic qua¬ternary carbons (8

130.90 and 133.36) and 2 hydroxy-olefinic quaternary carbons (8 144.61 and 145.93). MS: m/z [M + H]+ 310.0391 corresponding to C]5H]3NO2Cl2 . 1-(2-bromophenyl)- 6,7-dihydroxy- 1,2,3,4-tetrahydroisoquinoline (3e): Yield [from 3,4-dihydroxyphenethylamine (1.0 g, 5.27 mmol) and 2-bromobenzaldehyde (1.0 g, 5.27 mmol)], 1.45 g (77%); mp, 110-112 °C,was submitted to detailed analysis of]H NMR spectra (MeOD) allowing to differentiate the peaks at 8 2.91¬3.32 (m, 4H, -(CH2)2), 8 5.89 (s, 1H, -CH-N), 8 6.31-7.79 (m, 6H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 15 carbon signals into 2 methylenes (8 25.33 and 46.44), 1 methine (8 58.65), 6 olefinic methines (8 114.35, 114.56, 121.36, 127.41, 130.01, and 132.77), 3 olefinic quaternary carbons (8 126.75, 138.15, 147.28), 1 bromo-olefinic quaternary carbons (8 124.35) and 2 hydroxy-olefinic quaternary carbons (8 144.63 and 145.58). MS: m/z [M + H]+ 320.268 corresponding to C]5H]4NO2Br. 1-(3-bromophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3f): Yield [from 3,4-dihydroxyphenethylamine (1.0 g, 5.27 mmol) and 3-bromobenzaldehyde (1.0 g, 5.27 mmol)], 1.3 g (69%); mp, 125-126 °C,was submitted to detailed analysis of 1H NMR spectra (MeOD) allowing to differentiate the peaks at 8 2.83-3.27 (m, 4H, -(๓2)2), 8 5.35 (s, 1H, -CH-N), 8 7.18-7.60 (m, 6H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 15 carbon signals into 2 methylenes (8 26.48 and 40.34), 1 methine (8 59.08), 6 olefinic methines (8 114.72, 114.92, 127.93, 129.94, 130.47, and 133.56), 3 olefinic quaternary carbons (8 125.44, 140.89, 144.08), 1 bromo¬olefinic quaternary carbons (8 123.80) and 2 hydroxy-olefinic quaternary carbons (8 144.33 and 145.56). MS: m/z [M + H] + 320.0268 corresponding to C^H^NOsBr. 1-(4-bromophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3 g): Yield [from 3,4-dihydroxyphenethylamine (1.0 g, 5.27 mmol) and 4-bromobenzaldehyde (1.0 g, 5.27 mmol)], 1.4 g (74.5%); mp, 116-117 °C,was submitted to detailed analysis of 1H NMR spectra (MeOD) allowing to differentiate the peaks at 8 2.66¬2.93 (m, 4H,-(CH2)2), 8 5.19 (s, 1H, -CH-N), 8 6.14-7.31 (m, 6H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 15 carbon signals into 2 methylenes (8 26.49 and 40.01), 1 methine (8 58.75), 6 olefinic methines (8 114.55, 114.67, 130.47, 130.83, 131.90, and 131.56), 3 olefinic quaternary carbons (8 125.51, 136.70, 144.04), 1 bromo-olefinic quaternary carbons (8 120.54) and 2 hydroxy-olefinic quaternary carbons (8 145.70 and 147.89). MS: m/z [M + H]+ 320.0273 corresponding to C]5H]4NO2Br. 1-(2-fluorophenyl)- 6,7-dihydroxy- 1,2,3,4-tetrahydroisoquinoline (8 h): Yield [from 3,4dihydroxyphenethylamine (1.0 g, 5.27 mmol) and 2-florobenzaldehyde (0.7 g, 5.27 mmol)], 1.4 g (93.3%); mp, 148-149 °C, was submitted to detailed analysis of 1H NMR spectra (MeOD) allowing to differentiate the peaks at8 2.72¬3.18 (m, 4H,-(CH2)2), 8 5.36 (s, 1H, -CH-N), 8 6.16-7.36 (m, 6H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 15 carbon signals into 2 methylenes (8 27.58 and 40.87), 1 methine (8 53.50), 6 olefinic methines (8 114.86, 114.91, 115.05, 123.77, 128.97, and 129.89), 3 olefinic quaternary carbons (8 125.44, 140.89, 144.08), 1 fluoro-olefinic quaternary carbons (8 161.88) and 2 hydroxy-olefinic quaternary carbons (8 143.36 and 144.11). MS: m/z [M + H]+ 260.1075 corresponding to C]5H]4NO2F. 1-(3-fluorophenyl)- 6,7-dihydroxy- 1,2,3,4-tetrahydroisoquinoline (3i): Yield [from 3,4dihydroxyphenethylamine (1.0 g, 5.27 mmol) and 3-florobenzaldehyde (0.7 g, 5.27 mmol)], 1.3 g (86.7%); mp, 146-147 °C, was submitted to detailed analysis of 1H NMR spectra (MeOD) allowing to differentiate the peaks at8 2.75¬3.26 (m, 4H,-(CH2)2), 8 5.11 (s, 1H, -CH-N), 8 6.14-7.38 (m, 6H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 15 carbon signals into 2 methylenes (8 26.49 and 40.27), 1 methine (8 59.11), 6 olefinic methines (8 114.68, 114.90, 115.93, 116.66, 123.79, and 130.56), 3 olefinic quaternary carbons (8 125.44, 140.89, 144.08), 1 fluoro-olefinic quaternary carbons (8 163.74) and 2 hydroxy-olefinic quaternary carbons (8 144.29 and 145.51). MS: m/z [M + H]+ 260.1085 corresponding to C]5H]4NO2F. 1-(4-fluorophenyl)- 6,7-dihydroxy- 1,2,3,4-tetrahydroisoquinoline (3j): Yield [from 3,4dihydroxyphenethylamine (1.0 g, 5.27 mmol) and 4-florobenzaldehyde (0.7 g, 5.27 mmol)], 1.18 g (78.7%); mp, 128-129 °C,was submitted to detailed analysis of 1H NMR spectra (MeOD) allowing to differentiate the peaks at 8 2.94¬3.43 (m, 4H,-(CH2)2), 8 5.58 (s, 1H, -CH-N), 8 6.18-7.72 (m, 6H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 15 carbon signals into 2 methylenes (8 26.50 and 42.15), 1 methine (8 58.47), 6 olefinic methines (8 114.78, 114.92, 115.77, 116.41, 131.80, and 131.85), 3 olefinic quaternary carbons (8 125.48, 140.59, 141.08), 1 fluoro-olefinic quaternary carbons

(8 168.73) and 2 hydroxy-olefinic quaternary carbons (8 145.70 and 145.85). MS: m/z [M + H]+ 260.1085 corresponding to C15H)4NO2F. 1-(3-nitrophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3k): Yield [from 3,4-dihydroxyphenethylamine (1.0 g, 5.27 mmol) and 3-nitrobenzaldehyde (0.8 g, 5.27 mmol)], 1.5 g (88%); mp, 188-189 °C, was submitted to detailed analysis of]H NMR spectra (MeOD) allowing to differentiate the peaks at 8 2.83¬3.28 (m, 4H,-(CH2)2), 8 5.69 (s, 1H, -CH-N), 8 6.60-8.48 (m, 6H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 15 carbon signals into 2 methylenes (8 26.48 and 40.21), 1 methine (8 58.57), 6 olefinic methines (8 114.53, 114.85, 121.31, 124.88, 130.16, and 134.26), 3 olefinic quaternary carbons (8 125.84, 141.89, 143.08), 1 nitro-olefinic quaternary carbons (8 148.50) and 2 hydroxy-olefinic quaternary carbons (8 145.01 and 145.97). MS: m/z [M + H] + 287.1025 corresponding to C15H]4N2O4. 1-(4-nitrophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3l): Yield [from 3,4-dihydroxyphenethylamine (1.0 g, 5.27 mmol) and 4-nitrobenzaldehyde (0.8 g, 5.27 mmol)], 1.6 g (94%); mp, 196-198 °C, was submitted to detailed analysis of 1H NMR spectra (MeOD) allowing to differentiate the peaks at8 2.81¬3.32 (m, 4H, -(CH2)2), 8 5.47 (s, 1H, -CH-N), 8 6.15-8.32 (m, 6H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 15 carbon signals into 2 methylenes (8 27.24 and 40.96), 1 methine (8 59.92), 6 olefinic methines (8 113.91, 114.98, 125.85, 126.31, 129.43, and 129.95), 3 olefinic quaternary carbons (8 125.34, 138.83, 148.08), 1 nitro-olefinic quaternary carbons (8 150.84) and 2 hydroxy-olefinic quaternary carbons (8 144.49 and 147.43). MS: m/z [M + H]+ 287.1025 corresponding to C15HBN2O4 .1-(4- methylphenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3 m): Yield [from 3,4-dihydroxyphenethylamine (1.0 g, 5.27 mmol) and 4-methylbenzaldehyde (0.65 g, 5.27 mmol)], 1.12 g (72.7%); mp, 160-161 °C,was submitted to detailed analysis of 1H NMR spectra (MeOD) allowing to differentiate the peaks at 8 2.36-3.41 (m, 4H, -(ȣ2)2), 8 5.48 (s, 1H, -CH-N), 8 6.20-7.50 (m, 6H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 16 carbon signals into 1 methyl (8 20.14), 2 methylenes (8 26.54 and 41.57), 1 methine (8 59.24), 6 olefinic methines (8 114.16, 114.50, 128.58, 128.94, 129.51, and 129.52), 3 olefinic quaternary carbons (8 127.88, 139.42, 139.70), 1 olefinic quaternary carbons (8 134.43) and 2 hydroxy-olefinic quaternary carbons (8 145.53 and 147.78). MS: m/z [M + H] +256.1035 corresponding to C16HvNO2. 1-(4-a,a,a-trifluoromethylphenyl)-6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3n): Yield [from 3,4-dihydroxyphenethylamine (1.0 g, 5.27 mmol) and 4-triflorobenzaldehyde (0.95 g, 5.27 mmol)], 1.2 g (66%); mp, 180-182 °C, was submitted to detailed analysis of]H NMR spectra (MeOD) allowing to differentiate the peaks at 8 2.75¬3.26 (m, 4H,-(CH2)2), 8 5.11 (s, 1H, -CH-N), 8 6.14-7.38 (m, 6H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 16 carbon signals into 2 methylenes (8 26.49 and 40.20), 1 methine (8 58.87), 6 olefinic methines (8 114.43, 114.73, 125.59, 125.63, 129.76, and 129.89), 4 quaternary carbons (8 125.44, 140.89, 144.08), 1 quaternary carbons (8 124.87) and 2 hydroxy-olefinic quaternary carbons (8 145.78 and 147.93). MS: m/z [M + H]+310.1048 corresponding to C16H]4NO2F3 . 1-(4-a,a,a-trifluoromethoxyphenyl)-6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3o): Yield [from 3,4-dihydroxyphenethylamine (1.0 g, 5.27 mmol) and 4-trifloromethoxybenzaldehyde (1.0 g, 5.27 mmol)], 1.1 g (58%); mp, 176-178 °C,was submitted to detailed analysis of]H NMR spectra (MeOD) allowing to differentiate the peaks at 8 2.81-3.33 (m, 4H, -(ȣ2)2), 8 5.22(s, 1H, -CH-N), 8 6.14-7.69 (m, 6H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 16 carbon signals into 2 methylenes (8 26.49 and 40.82), 1 methine (8 59.57), 6 olefinic methines (8 114.58, 114.81, 119.55, 119.65, 130.79, and 130.96), 4 olefinic quaternary carbons (8 125.44, 140.89, 144.08, 145.85), 1 oxygenated quaternary carbon (8 129.99) and 2 hydroxy-olefinic quaternary carbons (8 148.24 and 144.88). MS: m/z [M + H] +326.0975 corresponding to C16H]4NO3F3. 1-(4-phenylphenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3p): Yield [from 3,4-dihydroxyphenethylamine (1.0 g, 5.27 mmol) and 4-phenylbenzaldehyde (1.0 g, 5.27 mmol)], 1.5 g (80%); mp, 195-196 °C,was submitted to detailed analysis of 1H NMR spectra (MeOD) allowing to differentiate the peaks at 8 3.01¬3.49 (m, 4H, -(CH2)2), 8 5.57 (s, 1H, -CH-N), 8 6.26-8.05 (m, 6H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 21 carbon signals into 2 methylenes (8 24.67 and 40.14), 1 methine (8 59.33), 11 olefinic methines (8 114.59, 114.99, 127.29, 127.41, 127.51, 128.17, 128.62, 128.72, 128.83, 129.91, and 129.98), 5 olefinic quaternary carbons (8 125.84, 137.25, 138.19,

141.35, 142.88) and 2 hydroxy-olefinic quaternary carbons (8 143.33 and 144.56). MS: m/z [M + H]+318.1405 corresponding to C]5H]4NO2CF3 .1-(4-chloro-3-nitrophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3q): Yield [from 3,4-dihydroxyphenethylamine (1.0 g, 5.27 mmol) and 4-chloro-3-nitrobenzaldehyde (1.0 g, 5.27 mmol)], 1.4 g (74.5%); mp, 193-194 °C, was submitted to detailed analysis of 1H NMR spectra (MeOD) allowing to differentiate the peaks at 8 3.01-3.25 (m, 4H,-(CH2)2), 8 5.74 (s, 1H, -CH-N), 8 6.22-8.01 (m, 5H, aryl). Detailed analysis of 13C and DEPT spectra allowed to differentiate the 15 carbon signals into 2 methylenes (8 26.44 and 40.04), 1 methine (8 58.61), 5 olefinic methines (8 114.57, 114.88, 126.94, 134.82, and 135.08), 3 olefinic quaternary carbons (8 125.54, 138.06, 138.08), 1 chloro-olefinic quaternary carbons (8 126.94), 1 nitro-olefinic quaternary carbons (8 148.25) and 2 hydroxy-olefinic quaternary carbons (8 144.89 and 146.19). MS: m/z [M + H] + 321.0631 corresponding to C^HB^OACI. Sources and characterization of bacteria: Twenty (20) clinical isolates of Salmonella (Salmonella typhi, S. paratyphi A, S. paratyphi B, S. typhimurium) including resis¬tant strains were isolated from clinical specimens in health facilities in the South West Region, Cameroon. In addition, two (2) control strains (S. typhimurium ATCC 14,028 and S. enteritidis ATCC 13,076) were obtained from American Type Culture Collection (ATCC, Manassas, USA). The cells were multidrug-resistant as characterized by bacteriologists at the various lab¬oratories by microscopy and biochemical tests were done using API 20E kit (Biomerieux SA, France) and were resistant to phenicol, beta-lactam, cephalosporin, fluoroquinolone antibiotics. Pure bacterial stocks were stored in 10% glycerol in Muller Hinton (MH) broth (Liofilchem, Italy) at -20 °C. Anti-Salmonella screening by disc diffusion: The assay was done as previously described [15] Briefly, a solution of each pure compound (50 pg/10)1L in DMSO) was prepared. The bacterial suspensions (McFarland 0.5, approximately 1.5 x 108CFU/mL in 0.85% saline) were spread on MH agar plates and allowed for 3-5 min to dry. Sterilized paper discs of 6 mm diameter prepared from Whatman filter paper No 9, were gently fixed at labelled positions on the agar surface and 10)1L of test solution was transferred onto each disc. The positive control chloramphenicol and the negative control DMSO were tested with 30 and 10)1L per disc, respectively.Plates were incubated for 24 h at 37 °C and zones of inhibition measured in millimeters. All experiments were performed in duplicate. Anti-Salmonella screening by micro-dilutionz: The assay was done to determine the minimum inhibitory concentration (MIC) as previously described [15,16] with some modifications. Briefly, stock solutions (1024 pg/mL) were prepared by completely dissolving each compound in 100)1L DMSO, 900pL of MH broth was added and mixed. Each stock solution of 75 pL was serially diluted in MH broth in duplicate test wells of a microtiter plate, to give final concentrations of 1-512 pg/mL. Bacterial suspensions were prepared in 0.85% sterile saline diluted in MH broth and 75 pL added at a final density of approximately 5 x 105 CFUs/mL. Positive (25 pg/mL gentamicin) and negative (cells in broth only) were included. The optical density (OD) was read at 595 nm (Emax microplate reader, Molecular Devices, USA) followed by incubation of the plate at 37 °C (DHP-9052, England) for 24 h. Inhibition of test strain growth was recorded visually and the OD read again. The MIC was taken as the lowest concentration well with > 50% inhibition of bacterial growth. To determine the minimum bactericidal concentration (MBC), 10 pL of the content of each well was sub-cultured on sterile nutrient agar and incubated at 37 °C for 24 h. The plates were observed for the presence of test strain colonies. The MBC was read from those inoculated plates as the lowest concentration of compound showing no bacterial growth.

Cytotoxicity test: The assay was performed for six compounds with MICs of 16 pg/mL as well as two compounds displaying MICs > 16 pg/mL) against monkey kidney epithelial cell line LLC-MK2 (ATCC, Virginia, USA) as described earlier in de¬tail [17]. Briefly, the cells were grown in complete RPMI-1640 culture medium (CCM, new born calf serum added), in a 5% CO2 incubator in humidified air at 37 °C (Heracell 150i, USA) and washed with incomplete (calf serum-free) medium (ICM), dislodged (x 5 trypsin-EDTA) and centrifuged at 125 x g for 10 min (Eppendorf 5810R, Germany). The cells were then re¬suspended in ICM, counted, diluted to 30,000/mL with CCM; 100 pL was seeded in a 96-well flat-bottom microtitre plate in duplicate and grown for 3 days to confluence. Each compound (2000 pg/mL in DMSO) was diluted with CCM and 100 pL added into duplicate wells at final concen¬trations of 7.8125-

1000 pg/mL. Positive (30 pM auranofin) and negative (2% DMSO in CCM) controls were included and the plates were incubated for 5 days. The plates were further processed as described, MTT (5000 pg/mL in ICM) was added, then incubated again for 30 min for viable cells to reduce the MTT to formazan precipitate. DMSO (100 pL) was added to dissolve the formazan precipitate. Each well content was gently mixed by shaking and optical density read at 595 nm. Percentage inhibition was calculated using the formula below:

$$\% \text{ Inhibition} = \frac{\textit{OD of Negative control - OD of ^^tract}}{\textit{OD of Negative control}} \text{X100}$$

Data and statistical analyses: Data were analyzed using Microsoft Excel 2010. Average zones of inhibition were recorded and interpreted based on reference zones of the Clinical and Laboratory Standard Institute [18] as follows: sensitive (highly active): > 20 mm; inter¬mediate (moderately active): 15-19 mm; weakly active 7-14 mm; inactive < 7 mm. Percentage inhibition of bacteria cell growth after 24 h of incubation was calculated using the formula: % Inhibition = [AOD (Negative control) - AOD (Com¬pound)] x 100. MIC and MBC values were determined as mentioned above. The 50% cytotoxicity concentration (CC50) of the compounds was determined by plotting the graph of %inhibition against the log of the concentration of the compounds, using a Graph pad prism.

Results and discussion: Anti-Salmonella activity of tetrahydroisoquinolines: The zones of inhibition produced by compounds against test strains including clinical isolates ranged from 8 to 24 mm (Table 1), while control strains gave zones between 8 and 18 mm in diameter. Based on CLSI reference zone diameters, seven compounds showed moderate (15-19 mm) to high activity (> 20 mm). The highest zone diameter recorded was 24 mm produced by 1-(4-chlorophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3b) against S. typhimurium, a multidrug resistant strain; this compound was the most active with high and moderate activity on 10 and 9 clinical isolates respectively. The compounds 1-(3-chlorophenyl)- 6,7- dihydroxy-1,2,3,4-tetrahydroisoquinoline (3c),1-(3,4-dichlorophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3d), 1- (4-a,a,a-trifluoromethylphenyl)-6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3n),1-(4-a,a,a-trifluoromethoxyphenyl)*6,7- dihydroxy-1,2,3,4-tetrahydroisoquinoline (3o),1-(4-phenylphenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3p) and 1-(4-chloro-3-nitrophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3q) also showed high and moderate activity on 7-11 strains. However, when the average zone of inhibition on all strains is considered, compound 3b again was the most active with the highest average activity of 17.0 mm; two other compounds, 3n and 3o, had moderate activity of 15.7 and 14.8 mm respectively, and thirteen compounds had overall low activity (Table 1). The chloramphenicol positive control (PC) zones ranged from 15 to 35 mm with 16 isolates sensitive (> 18 mm) and 8 with intermediate sensitivity. The active compounds had average percentage activities relative to the activity of PC of 84% for 3b, 78% for 3n, 73% for 3o and 61% for 3c (Table 1).

Table 1

Anti-Salmonella activity of tetrahydroisoquinolines by disc diffusion.

Bacterial strains	3b	3n	3o	3c	3a, d - m, p, q	PC
S.	1	1	16	1	8-15	1
S.	2	2	10	1	8-12	1
S. typhi	1	1	10	1	8-12	2
S.	2	1	15	1	8-12	2
S. typhi	1	1	8	1	8-12	1
S. typhi	1	1	15	2	8-14	2
S. paratyphi	1	1	12	1	8-14	2
S. typhi	2	2	20	1	8-15	3
S. paratyphi	1	1	10	1	8-11	1
S. typhi	2	2	18	1	8-1	2
S.	1	1	12	1	8-10	2
S.	2	2	20	1	8-18	3
S.	2	1	20	1	8-12	2
S. paratyphi	2	1	17	1	8-20	2
S.	2	1	22	1	8-10	2
S. paratyphi	2	2	15	1	8-15	2
S.	1	2	15	1	8-10	1
S. typhi LI60	1	1	19	8	8-12	3
S.	2	2	15	1	8-14	2
** *S.*	1	1	11	1	8-12	2

S.	1	1	18	1	8-12	2
S. typhi	1	1	10	1	8-10	1
[C] *S.*	1	1	18	1	8-12	1
[C] *S.*	1	1	10	1	8-11	1
Average	1	1	14.8	1	8.5-10.9	2

* Percentage activity of compounds with high activity 3b, 3n, 3o and 3c relative to positive control (PC), chloramphenicol (30 gg disc). C: Control strains: S. typhimurium ATCC 14,028 &S. enteritidis ATCC 13,076); all other strains are multidrug resistant clinical isolates (except** BU66 susceptible strain). ^: Overall low activity of these compounds (3a, d to m, p, and q) presented as a range. The seventeen compounds tested showed MIC values ranging from 16 to 512 gg/mL (Table 2). The lowest MIC value was 16 gg/mL produced by compounds 3b and 3n against both control and multidrug resistant clinical Salmonella strains. Notably, these compounds were as well the most active against nine bacterial isolates. Compounds 3c, 3d, 3e and 3q also had MICs of 16 gg/mL but on clinical isolates only. Compounds 3 h, 3i, 3j and 3i did not produce a MIC in the range tested on the controls (ATCC 14,028 and ATCC 13,076). Eleven compounds (3a, 3f to 3 m, 3o and 3p not shown in Table 2) have MICs > 32 gg/mL against 3-15 strains. For the 17 compounds, the MBC ranged from 64 to 512 gg/mL. Only two compounds, 3b and 3n, recorded MBCs within the range tested for all but one strain for 3n. Both compounds equally showed the highest number of MBC:MIC ratios < 4 (Table 2a and b) indicating that they are bactericidal. The rest of the compounds recorded MBCs for less than half of the strains (not shown in the tables); hence were rather weakly bactericidal. The activity pattern of the compounds was consistent in both the disc and broth bioassays indicating the experimental systems were well constituted and confirming the intrinsic activity of the active compounds. Based on CLSI reference data (CLSI, 2018), compounds 3b and 3n have comparable activity to some antibiotics in the recommended treatment classes which have sensitive zones < 24 mm, the largest for compound 3b (Table 1); for example, ampicillin (> 21 mm at 100 gg), trimethoprim-sulfamethoxazole (> 16 mm at 1.25/23.5 gg), chloramphenicol (> 18 mm at 30 gg), azithromycin (> 13 mm at 15 gg), ciprofloxacin (> 21 mm at 5 gg) and cefixime (> 19 mm at 5 gg). Their lowest MIC (16 gg/mL) is same as sensitive breakpoint for azithromycin (< 16 gg/mL). Some studies have reported good antibacterial activity of synthetic THIQs. Marked antitubercular activity was recorded for two synthetic 5-bromo-8-hydroxy THIQs with 3’ , 4’ -methylenedioxybenzyl or 2’ , 3’ -methylenedioxyphenyl substitution) in a series of forty compounds inspired by (S) -leucoxine, a naturally occurring THIQ [19] A series of 1-aryl-1,2,3,4-tetrahydroisoquinolines showed moderate, broad spectrum bacteriostatic activity with structure-related activity [16]. Table 2 - Minimum inhibitory concentrations, Minimum bactericidal concentrations and MBC:MIC ratios of tetrahydroisoquinolines on multidrug resistant Salmonella

	Compounds					
	3b	3	3d	3e	3n	3q
	MIC, MBC (MIC:MBC)					
	5				5	
	1				3	
	1				5	
	3				1	
	3				5	
	5				5	
	2				5	
	3				1	
	2				5	
	2				5	
	1				-	
	3				3	
	2				1	
	3				3	
	5				1	
	3				6	
	5				2	
	6				1	
	1				2	
	5				1	
	3				3	
	3				3	

No MIC due to < 50% inhibition of bacterial growth or no MBC within concentration range tested. Strain is

defined in Table 1. MBC:MIC ratio in parentheses for compound 3b and 3n. Compounds 3a, 3f to 3m, 3o and 3p not shown in the table, have MICs: 32-512 |ig/mL against 3-15 strains. Table 3 - Cytotoxicity and selectivity index of selected compounds based on lowest MIC value

Co mpo	Lowest MIC (pg/mL)	CC_{50} (pg/mL)	Selectivity Index value
3b	16	9.8×10^{-3}	6×10^{-5}
3c	16	121.9	7.6
3d	16	127.1	7.9
3e	16	8.755	0.55
3j	256	904.9	3.55
3n	16	2592	162
3o	32	134.1	4.2
3q	16	22.06	1.4

Cytotoxicity of compounds: Of the six active compounds (MIC = 16 pg/mL), three were not cytotoxic (CC50 > 30 pg/mL,cut -off point for cytotoxic¬ity), and one of the two with MICs > 16 pg/mL was not cytotoxic (Table 3), [20]. Of the two overall most active compounds (3b and 3n), 3n, was highly non-cytotoxic (CC50 = 2592 pg/mL) with a relative selectivity index (SI) of 162 whereas the other, compound 3b, was highly cytotoxic with extremely low CC50 and SI values (Table 3). The vast difference in the cy¬totoxicities of the two most active compounds suggests the toxicity of the chemical series is highly determined by the substituent groups.

Structure-activity relationship: The seventeen compounds that were tested contained the same basic scaffold. The differences observed in their bi¬ological profiles may be attributed to the nature of the substituent and its position on the pendant phenyl group of the scaffold. Compounds 3b and 3n were the most active with moderate activity for 3o. The feature which is common with these compounds is the presence of electron-withdrawing substituents at the para-position of the pendant phenyl group. Compound, 1-(4-chlorophenyl)-6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3b) is the overall most active. This ac¬tivity may be due to the fact that chlorine is inductively withdrawing (-I) and resonance donating (+M) making it or- tho/para directing. Compound, 1-(4-trifluoromethylphenyl)-6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3n) was more ac¬tive than 1-(4-trifluoromethoxyphenyl)-6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3o) maybe because the substituent in 3n (-CF3) is more electron-withdrawing than the substituent in 3o (-OCF3). The presence of substituent at the meta¬position in 1-(3-chlorophenyl)-6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3c) reduces the activity. The disubstitution as in compounds 1-(2,4-dichlorophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3a), 1-(3,4-dichlorophenyl)-6,7-dihydroxy- 1,2,3,4-tetrahydroisoquinoline (3d) and 1-(4-chloro-3-nitrophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3q) did not improve the activity. Compounds 1-(4-fluorophenyl)-6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3j), 1-(3-nitrophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3k), and 1-(4-nitrophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3l) which have fluorine as a substituent were inactive maybe because of the small size of fluorine making it highly electron-withdrawing than chlorine. The presence of bromine in compounds 1-(2-bromophenyl)- 6,7-dihydroxy-1,2,3,4- tetrahydroisoquinoline (3e), 1-(3-bromophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3f) and 1-(4-bromophenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3 g) did not improve the activity maybe because of the lower electron¬withdrawing properties. The presence of the nitro group in compounds 3k and 3l decreases the activity. This may be due to the strong deactivating electron-withdrawing property. Compounds with electron-donating groups 1-(4- methylphenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3 m) and 1-(4-phenylphenyl)- 6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline (3p) were inactive.

Conclusion: A series of seventeen 1-aryl-6,7-dihydroxy-1,2,3,4-tetrahydroisoquinolineanalogues (THIQs) was synthesized using sim¬ple methodology and characterized using modern spectroscopic techniques. Based on the diameter of the zone of inhibi¬tion, two of the seventeen compounds (3b and 3n) showed moderate to high activity against all multidrug-resistant clini¬cal isolates of Salmonella with MICs ranging from 16 to 512 pg/ml, comparable to recommended treatment antibiotics for Salmonella infections. The

presence of electron-withdrawing substituents at the para-position of the pendant phenyl group may account for their activity. The cytotoxicity test on active compounds showed that the CC50 were much higher than the cut-off value (C〔50>30 pg/mL) for lack of cytotoxicity indicating that the compounds may not possess a high risk of toxi- city.Therefore, subsequent chemical modification of this series should seek to increase potency while reducing toxicity.The seventeen tetrahydroisoquinolines (THIQs) studied have demonstrated moderate but structure-related antibacterial activity. Further medicinal chemistry exploration based on the active structures may yield a highly active antibacterial lead. Data availability statement: Data included in article/supplementary material/referenced in the article. Additional information: No additional information is available for this paper. Funding: J.N.H. was supported by the African-German Network of Excellence in Science (AGNES). Declaration of Competing Interest: The authors declare no conflict of interest. Credit authorship contribution statement: Joelle Ngo Hanna: Supervision, Conceptualization, Writing - original draft. Rita A. Ndip: Writing - original draft. Moses N. Ngemenya: Writing - original draft, Investigation. Casey R. Simons: Supervision. Flavien A. A. Toze: Investigation, Data curation, Formal analysis. Stephen M. Ghogomu: Writing - original draft, Investigation, Data curation, Formal analysis. James A. Mbah: Investigation, Data curation, Formal analysis. **Acknowledgements**: J.N.H. is grateful for the support received from the African-German Network of Excellence in Science (AGNES), the Federal Ministry of Education and Research (BMBF), and the Alexander von Humboldt Foundation (AvH). The reviewers are highly appreciated for their very constructive criticisms of the original submission. The authors acknowledge the Biotechnology Unit of the Faculty of Science for access to research facilities.

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The Effects of Brief Internet-Based Cognitive Behavioral Therapy Intervention for Senior Students with Health Anxiety During The COVID-19 Pandemic

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Abstract: This study aimed to assess the efficiency of a brief online, self-guided online cognitive behavioral therapy for general and health anxiety of high school senior students. 286 (age 18-19) students in eight high schools of Mashhad were selected randomly and assessed with the short form of Health Anxiety Inventory<17 and Beck Anxiety Inventory <15 was selected. Participants in the intervention group (n = 143) received 4-week iCBT worksheets, while the control group (n= 143) did not receive any interventions. After post-assessment. The total score of SHAI is decreased by 6.6(26%); for general anxiety, which was assessed with BAI, ANCOVA analysis indicated f (77), p <0.001, partial η2 = .23. in the health anxiety, analysis of the values in the total score indicated a significant difference between two groups f (10.76), p <0.001, partial η2 = .61. online self-guided CBT could be efficient for students to reduce their general and health anxiety during the COVID-19 pandemic.
Keywords: ICBT, Health Anxiety, Anxiety, COVID-19, Student, SHAI
Introduction: Since the WHO pandemic announcement on March 11, 2020, many people have been

infected, and even more than those have been influenced by the pandemic. People have been faced with many socio-economic consequences of this worldwide phenomenon. Those consequences increase the level of mood disorders, anxiety, sleep problems, and alcohol consumption (Czeisler, Howard, & Rajaratnam, 2021). Under these circumstances, worry about health, belongings, and financial issues would be inevitable among lots of people, even can cause increases in health anxiety levels (Wahlund et al., 2020). It has been shown that psychological distress in the current pandemic identified young adults aged 18–23 as the most vulnerable group, reporting the highest levels of stress and most significant prevalence of depressive symptoms among all ages surveyed (American Psychological Association, 2020). Many students have encountered more issues compared to other groups of societies during school closures (Esposito et al., 2021). Among those, senior students face more stressors, two of which are the national universities entrance exam and their national final exam. The stress of these has a lot of pressure on them, especially during the COVID-19 pandemic. (Guessoum et al., 2020). It was indicated that senior students' anxiety and worrying have been increased during the pandemic (Giannopoulou et al., 2021). The DSM-5 diagnostic criteria for illness anxiety disorder (previously known as health anxiety) specifies that the following symptoms need to be present for at least six months: pre-occupation with illness, absence of somatic symptoms, hypervigilance of own health, self-monitoring for signs of illness, complete avoidance of medical care or the conversely frequent seeking of medical care (APA, 2013). Diagnosis data about health anxiety prevalence are quite meager because it is relatively recent (Tyrer, 2018). A recent Australian national survey indicated a lifetime prevalence of health anxiety of 5.7% and a current prevalence of 3.4%, which is higher than previous studies (Sunderland, Newby, & Andrews., 2013). Another study indicated that approximately half of the undergraduate students in their sample reported clinically elevated psychological distress: health anxiety was most commonly elevated (30.3%), followed by depression (25.4%) and general anxiety (22.3%) (Kibbey, Fedorenko, & Farris., 2021). During this unorthodox circumstance A brief psychological intervention for worrying about COVID-19 and health anxiety could be effective; it would also be time-saving and cost-effective (Wahlund et al., 2020). Also, internet-based CBT could have effectively decreased depression and anxiety symptoms (Aminoff et al., 2021). In another recent study, college students who received app-based CBT showed decreases in stress, anxiety, depression, and risky behaviors such as alcohol and tobacco abuse and sexual knowledge (Oliveira et al., 2021). In the current situation, students need more psychological help and support; online and self-guided intervention could provide those for more considerable proportion of the students. Therefore, the aim of this study was designing then assessing the efficiency of a brief online, self-guided online cognitive behavioral therapy for students.

Method: **Participants**: Participants were all boy senior high school students and unpaid volunteers (aged 18-19). We used stratified random sampling to select eight high schools with a population of 1181 senior students among eight educational districts in Mashhad. 188 students did not participate in the study; thus 993 participants were assessed with Health Anxiety Inventory (SHAI) and Beck Anxiety Inventory (BAI). The students with moderate (BAI=16-25) and severe anxiety (BAI=26-63) in the Beck Anxiety Inventory and anxious (SHAI=18-37) and hypochondriac (SHAI=38-54) in the short form of Health Anxiety Inventory were interred the study sample. Exclusion criteria were: (a) got a score in SHAI 17 or less (n=658), (b) got a score in BAI 15 or less (n=707), (c) non-responders to assessments (n=194). Eventually, 286 students with SHAI<17 and BAI<15 were selected.

Materials: Short form of Health Anxiety Inventory (Salkovskis et al., 2002) SHAI is a self-report scale developed by (Salkovskis et al., 2002) and has 18 questions. The first 14 ones have four options, out of which individuals should select the one that best describes their mental state. Questions15-18 are intended to measure mental state in the event of influential and severe conditions, so it has three scores; main section, negative consequences, & total score. All questions are scored 0–3, with higher scores illustrating more health anxiety. The total score ranges from 0 to 54, below 0-17 for control patients, above 18-37 is anxious patients, and 37-54 is hypersonic patients (Salkovskis et al., 2002). The Persian validity and reliability were studied by Nargesi (Nargesi et al., 2017). Beck Anxiety Inventory (Beck, & Steer., 1993) - The Beck Anxiety Inventory (BAI) is a 21-item self-report measure used to assess anxiety severity. It has strong psychometric properties related to internal consistency, validity, and reliability. The

BAI is sufficiently capable of identifying anxiety symptoms in clinical populations and healthy ones (Rafiee & serif, 2013). It was suggested that score the inventory as 0–7: minimal anxiety; 8–15: mild anxiety; 16–25: moderate anxiety; and 26–63: severe anxiety (Beck, & Steer., 1993). It has been normalized by Rafiee (Rafiee & serif, 2013) in Iran.

Procedure: Data collection took place during the sixth wave of the Covid-19 pandemic in Iran in January, February, and March 2022. Figure 1 indicates the dates of each phase of the study relative to Covid-19 deaths and key dates in the sixth wave of the pandemic. Participation in the study took place entirely online. SHAI and BAI were uploaded on Porsline (https://porsline.ir). Then the link of inventories and study advertisement with adequate information about the study was sent via Shad app to all senior students in those eight high schools (N= 1181). Out of 993 volunteers who completed the inventories via the link, 286 got SHAI 18 or more scores, and BAI 16 or more were interred to the study. All of the procedures took place anonymously, and there was no need for volunteers to disclose any information about themselves except their Shad app links and ages. The participants were included in the trial When the baseline assessment was completed. Figure 1.

Randomizing participants were randomized to an intervention group (n= 143) & control group (n= 143) on a 1:1 ratio. Randomizing was done on a protected website (www.randomize.net) and helped us ensure that each of the participants had an equal chance to be in either group and no influence by researchers on the group allocation. Figure 2.

Intervention group Participants (n= 143) received the 4-week intervention which was a totally self-guided program. It consists of cognitive-behavioral worksheets for health anxiety and general anxiety, specifically to reduce COVID-19 distress. Each one includes a written part (maximum two pages) and some tasks for the participants to practice during that week sent on a weekly basis. In the first worksheet relationship between anxiety, genetics, personality, neurochemicals of anxiety, and our experience of being anxious was clarified. Participants should have identified their terms for anxiety definition and changed them with more helpful thoughts. The participants are encouraged to write about their worry thoughts and show their anxiety symptoms. After that, they should have answered some questions about their experience during the week; how helpful those changed thoughts could be? Moreover, how much knowledge about symptoms of anxiety could be effective? The first week aimed to give the participants more understanding of anxiety and its causes and effects. In the second module, first thoughts, feelings, and actions were evaluated for participants. They should have identified their feelings and thoughts on an ordinary day on a table. They had another table where they should put their actions that led to anxiety during the week and have scored and evaluated their amount of anxiety in the table properly. Having a brighter point of view about the relationship between thoughts, feelings, and actions was the primary goal of this module. In the following worksheet, participants were given information about cognitive distortions. Distortions related to anxiety and health anxiety, mainly related to COVID-19, had been defined, and participants were being studied to challenge them and transform those negative thinking patterns with more helpful thoughts. They could study the mechanisms and consequences of cognitive distortions on their general and health anxiety. Module four covered writing exercises about anxiety. They should have written about their feelings when they feel anxious and their symptoms. They have been encouraged to name their feelings as sharp as possible, but they have also been supposed to clarify their similarities and differences. Afterward, a deep breathing technique was taught to the participants to manage worrisome thoughts better. This module aims to illuminate feelings, discriminate anxiety from others, and give a coping strategy to participants.

Control Group Participants who were randomized to the control group (n= 143) were not given access to any interventions. It has been told that they feel free to contact their regular healthcare providers if their anxiety symptoms worsen significantly. After four weeks, the online assessments link was sent to all participants(n=286).

Data protection and confidentiality All of the participants had to approve they agreed to use their data in the study. The website (Porsline) anonymously gathered their responses to inventories in both phases. Each particular IP address contained the website to prevent attendance more than once. The website allocated a particular code to participants, and during the study, all the data were not personally

identifiable to anyone.

Statistical Analyses This study aimed to elaborate the effects of the online self-guided CBT on health anxiety and general anxiety during COVID- 19 pandemic and compare the outcomes with a control group. To measure the effects of the self-guided CBT, scores of assessments from Porsline were examined. Data from participants that completed on Porsline at both phases (i.e., the pre & post-assessment) were included in the corresponding analyses. After that, four ANCOVAs were conducted to determine the statistically significant between online self-guided CBT and the control group on health and general anxiety. The pre-assessment measures were covaried to separate the influence of any differences in the pre-assessment measures between the intervention and control groups. The statistical procedures were performed using the Statistical Package for Social Sciences 26.0.

Results Table 1 indicates the number and average proportion of The Beck Anxiety Inventory and Health Anxiety Inventory in two groups. As the data displays, all of the proportions were decreased in the post-assessment in the intervention group compared to the baselines. However, any decline is not reflected in the control group in the post-assessment. The total score of SHAI is decreased by 6.6(26%) after a 4-week self-guided CBT program, although in this variable, we can see a minor increase in the control group after 4-week. Table 1. There was a significant difference between the CBT intervention group and the control group in the values of post-assessments. For general anxiety, which was assessed with BAI, ANCOVA analysis indicated f (77), $p < 0.001$, partial $\eta 2 = .23$. in the health anxiety, analysis of the values in the total score indicated a significant difference between two groups f (10.76), $p < 0.001$, partial $\eta 2 = .61$. Furthermore, there were significant differences in the two subscales of SHAI main section f (308.39), $p < 0.001$, partial $\eta 2 = .55$ and negative consequences f (101.11), $p < 0.001$, partial $\eta 2 = .29$ in the post-assessments of the intervention in comparison with the control group. These data display that after the intervention, the mean of the anxiety and health anxiety assessments decreased significantly compared with the control group (see Table 2). Table 2.

Discussion Our study assessed whether a brief online, self-guided cognitive behavioral therapy intervention could significantly decrease general anxiety and health anxiety during the sixth COVID-19 wave in high school senior students. While the control group values increased over time, the intervention group had significant reductions in general anxiety and health anxiety with medium between-group effect sizes MANCOVAs analysis. Also, the intervention caused a significant reduction in two sub-scales of the SHAI (the main section and the negative consequences) compared to the control group. The dropout rate in the intervention group indicated that the intervention was highly acceptable among senior students. Consequently, this brief online, self-guided CBT intervention effectively reduced general anxiety and health anxiety during the COVID-19 pandemic and helped enhance the high school students' health. Although in most of the previous studies, treatments were longer (almost ten weeks) than ours (Anderson et al., 2017 & Anderson et al., 2020), one of the other ones was one week briefer (Wahlund et al., 2020) all of the results were in the same line as previous studies (Anderson et al., 2017 & Anderson et al., 2020, Wahlund et al., 2020, Aminoff et al., 2021, Ying et al., 2021). however, the current study is the first to assess the psychological intervention for general and health anxiety during the COVID-19 pandemic for senior high school students. This effectiveness of the brief online, self-guided CBT means that in extraordinary conditions like the COVID-19 pandemic, we are able to alter this intervention to the mainstreamed ones to access the treatments for a larger proportion of the students. Online interventions are also more flexible and more economical. The students can access an effective intervention for their anxiety via digital platforms. It means we are able to use these kinds of online interventions and supports for other parts of society as well, and it was successful in the general population (Wahlund et al., 2020). Moreover, the usage of the online therapies and interventions for distress and health anxiety has been increased (Mahoney et al., 2021, Staples et al., 2020, Titov et al., 2020, Li et al., 2020). The fast altering of the COVID-19 pandemic makes controlling a study difficult, and the circumnutates are very fluctuated. We started at the sixth wave of the pandemic when the high schools were closed in Iran. The increasing death rate in figure 1 indicates why post-assessments in the control group had a small amount of increase. At the same time, the intervention we developed for the senior students was significantly effective. Although, it showed that the effect size was more significant than the brief online, self-guided (Cuijpers et al., 2014 &

Wahlund et al., 2020). General anxiety between-group effect size was not very large but more significant than the most recent study (Brog et al., 2022), and it was significantly effective in the same line of results for increasing worry and anxiety during the COVID-19 pandemic (Wahlund et al., 2020 & Aminoff et al., 2021). Also, internet-based CBT effectively reduced general anxiety and distress of adults during the COVID-19 pandemic (Ying et al., 2021). Although health-related anxiety and distress are common in children and young people, with 15.7% of a sample of 14- to 19-year-olds reporting clinically significant hypochondriacal symptoms during the COVID-19 pandemic, it has been increased (Haig-Ferguson et al., 2020). To decrease the HA, the intervention was effective, and the largest between-group effect size was seen in the HA (total score of SHAI); this reduction was in the same line as another study in which iCBT helped to significantly decrease health anxiety in this pandemic (Sharrock et al., 2021). There was a significant reduction in all four aspects of anxiety, all of which capered with the control group after a 4-week online self-guided CBT in eight high schools in Mashhad. This program was scalable, accessible, and effective in managing health anxiety general anxiety as well. A reduction in all elements of anxiety assessed in this study may indicate that a specific self-guided iCBT program can target both general and health anxiety among students. Therefore, this kind of easily scalable intervention would be beneficial for students. We foresee the impact of this program on the other students and then on general society in future research. Moreover, comparing this program to regular CBT psychotherapy would illuminate the effectiveness. Also, what would be the follow-up analyses after one year? These are some suggestions for further examination and studies.

Statement of Ethics: The authors declare that all of the procedures of this study comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

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Data availability statement: The data that support the findings are available from the corresponding author upon reasonable request.

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Table 1. Baseline and post-assessment scores were averaged, and their standard deviation was in the intervention and control groups

	Intervention group			Control group		
	n	M	SD	n	M	SD
Baseline Variable						
BAI	143	23.87	5.69	143	22.34	4.43
HAI main section	143	19.41	4.95	143	21.77	4.63
HAI negative consequences	143	5.69	1.74	143	5.93	1.78
HAI total score	143	25.1	6.04	143	27.7	5.39
Variable of post-assessment						
BAI	126	20.27	4.1	125	22.68	4.35
HAI main section	126	14.31	3.01	125	28.04	5.01
HAI negative consequences	126	4.19	1.53	125	6.03	1.86
HAI total score	126	18.5	3.52	125	22.01	3.79

Table 2. Findings from the ANCOVAs analysis indicate group post-assessment differences in SHAI and BAI outcome variables.

Source group	Type III Sum of squares	df	F	Sig.	Partial Eta Squared
BAI	724.63	1	77	.000	.23

HAI main section	2570.33	1	308.39	.000	.55
HAI negative consequences	192.11	1	101.11	.000	.29
HAI total score	4178.73	1	10.76	.000	.61

Figure 1. timeline of baseline data collection, online intervention, and post-test data collection relative to sixth wave covid-19 pandemic daily death rate in Iran. On December 19, 2021, the first positive case of the Omicron Coronavirus variant was identified in Iran. On January 14, 2022, Iran's health ministry reported the first three death from Omicron. Baseline data collection commenced on January 28, 2022. After one week, the online interventions were sent to participants from February 5 to March 4, 2022. the final data collection phase commenced on the 5th to 9th of Mar 2022. Data on covid-19 deaths sourced from https://behdasht.gov.ir/

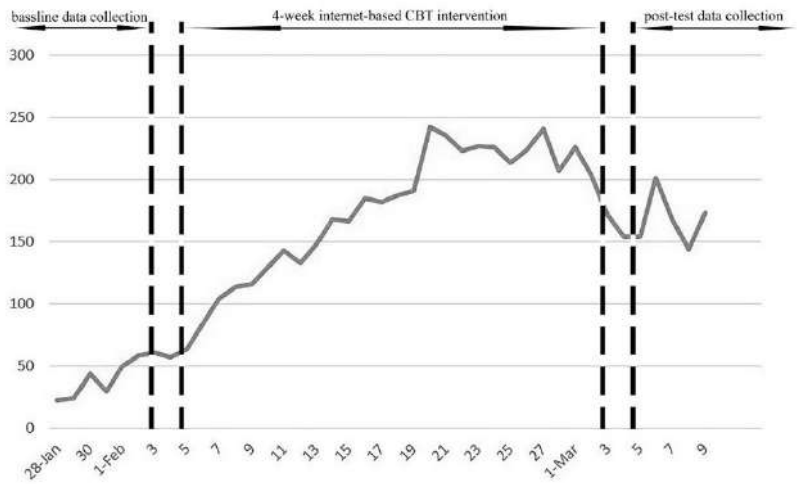
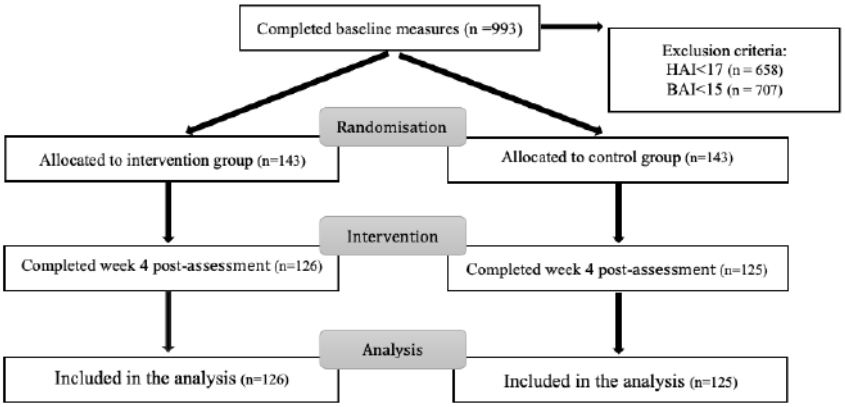


Figure 2. Flow diagram of the number of participants who were retained in each condition for each phase of the study, of the n=286 who completed the baseline measures



About Heart

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Abstract: Due to the increasing number of men and women who are unaware about the working of heart and hear t disease and surgery and how can the heart valve and coronary artery bypass surgery be done. The person who had come for health check-up were told about heart, how it works, its valve, the effect of valve on heart, how the heart valves are check and how can they be cured by different surgery. They were told about cigarette smoking, alcohol drinks, fat consumption, nature of physical exercise and other important things and what the burden of smoking for our economy is. And how can we improve the heart and keep it healthy by this teaching we could save lot.
Keywords: Heart, Valve, Surgery, Cigarette, Alcohol, Fat, Exercise
Paper: The heart is divided into a right and left portion. The right portion receives blood (which is impure) from the body and pumps the same to the lungs for purification (oxygenation). The impure blood enters the heart from two large veins called the superior and inferior vena cava. The blood from these veins enters an upper chamber known as the Right Atrium. This chamber also receives impure blood from the heart veins through the coronary sinus. The right atrium pumps this blood into the Right Ventricle or the lower chamber through a Tricuspid Valve. The tricuspid valve prevents blood from flowing from the right ventricle to the right atrium. The right ventricle pumps blood into the Pulmonary Artery. The Pulmonary Valve prevents blood from leaking back into the right ventricle. The pulmonary artery carries impure blood to the right and left lungs. The left half of the heart collects and pumps pure (oxygenated) blood from the lungs to all parts of the body. The blood from the lungs enters the heart from four veins called the Pulmonary Veins. These veins bring the blood into the upper chamber called the Left Atrium. The left atrium pumps blood through the Mitral Valve into the left ventricle. The mitral valve prevents blood from leaking back from the left ventricle to the left atrium. The left ventricle pumps the blood into the Aorta which circulates to all parts of the body. The Aortic Valve prevents blood from leaking back into the left ventricle. The four valves in the heart are the Mitral and Aortic valves on the left side and Tricuspid and Pulmonary valve on the right side. Of these, the mitral valve is most commonly affected by diseases. The Aortic valve is second most commonly affected heart valve. The tricuspid valve is never diseased alone. Disease of the tricuspid valve always accompanies diseases of the mitral valve.
Causes of the Valve Diseases: The most common cause of valve diseases in children and adults is known as Rheumatic Heart Disease. This problem occurs because of the poor hygienic conditions, malnutrition and infection by microorganism (Streptococcus). Rheumatic Fever produces sore throat, joint pains, swelling of the joints, fever and others symptoms. Repeated attacks of such symptoms may cause heart valve disease in the long run. This rheumatic heart disease affects the mitral valve most commonly, the Aortic valve and the Tricuspid valve in the order. The Pulmonary valve is almost never affected by long standing rheumatic heart disease (RHD). This may cause narrowing or leakage of one or more valves. The other most common cause of valves disease is birth defects. This abnormality may affect the Aortic valve or the mitral valve. They usually cause narrowing of the aortic valve or leakage of the mitral valve.
Effects Of Valve Disease: **Mitral Stenosis (MS):** This means narrowing of the Mitral valve. As a result, blood cannot pass into the left ventricle and becomes dammed in the left atrium and pulmonary veins. The

pressure in the left atrium also increases and in long standing mitral stenosis the pressure in the pulmonary artery also increases. The valve may also become hardened (calcified). Clots may also be found in the left atrium because of the stagnation of blood. The patient suffers from reduced blood flow to the body and increased pressure in the lungs which causes shortness of breath, rapid beating of the heart (palpitation) and heart failure. It may also lead to paralytic stroke if blood clots or calcium particles go away in the blood circulation. The patient may also develop spitting of blood (hemoptysis).

Mitral Regurgitation (MR): Mitral regurgitation means leaking of blood from left ventricle to left atrium. The effects of such a leak are similar to the effects of mitral stenosis (MS). However, mild Mitral Regurgitation (MR) can be tolerated without any serious consequences for a long time. If the leak is severe the patient develops enlargement of the heart, shortness of breath, palpitations and heart failure. Both stenosis and mitral regurgitation may be present together.

Aortic Stenosis (AS): Narrowing of the Aortic valve particularly in children is usually due to birth defects. However, rheumatic heart disease can also cause narrowing of the aortic valve. As a result, pressure in the left ventricle increases. The left ventricle becomes very thick. The flow of blood to the body decreases. The valve may also become calcified. As a consequence of these, the patient may suffer fainting attacks, shortness of breath and palpitation. Sudden death has also been known to occur in such patients.

Aortic Regurgitation (AR): Leaking of the aortic valve causes return of blood from Aorta to the left ventricle. The heart becomes enlarged and the ventricle becomes thick. Blood flow to the body decreases and the patient suffers from low blood flow. This causes breathlessness, palpitation and heart failure. Both aortic stenosis and aortic regurgitation may be present together and is usually due to rheumatic heart disease (RHD). Hardening of the aortic valve (calcification) occurs more often in older patients. This may cause paralytic strokes or heart attacks.

Tricuspid Stenosis (TS): Tricuspid stenosis is usually caused by rheumatic heart disease (RHD). Because of this, there is obstruction to blood passing from the right atricum to the right ventricle. This results in enlargement of the liver, swelling on the feet, fluid accumulation in the abdomen and heart failure. **Tricuspid Regurgitation (TS)**: This may be due to enlargement of the right ventricle or due to effects of rheumatic heart disease. Because of the leak blood returns from the right ventricle to the right atrium. This is always seen together with mitral valve disease. The patient may suffer the same consequences as in tricuspid stenosis.

Symptoms: The patient experiences some difficulties when one of the heart valves is damaged. These difficulties are known as symptoms. One of the most common symptoms in breathlessness. In the early stages breathlessness is experienced on exercise like running, cycling, climbing stairs etc. However, as the disease progresses and becomes more pronounced the patient experiences breathlessness by just walking to the bathroom and sometimes even at rest. In extreme cases patient may be unable to lie down and may experience breathlessness just sitting up. The other most common symptoms are a thumping in the chest known as palpitation. This is due to rapid and forceful beating of the heart. Heart beat becomes irregular and fast in some patients with valve disease. Again, palpitation may come on with exercise or may even occur at rest. The next common symptoms are tiredness (Fatiguability). This may be experienced in the early stages and becomes more pronounced as the disease progresses. Patients with mitral valve problems may also have blood spitting. This is because of the severe narrowing of the valve in mitral stenosis (MS). Patients with aortic valve disease may notice giddiness, black out or fainting attacks. Patients with tricuspid valve disease may notice swelling on the feet, abdominal distension and bluish discoloration. In patients with calcified valves or in patients with clots inside the heart, paralytic strokes may occur resulting in paralysis of one limb or one side of the body or loss of speech. Permanent damage is sometimes quite likely.

Tests For Valve Diseases: Most heart valve disease patients can be diagnosed with an x-ray of the chest, ECG and Echocardiography. Echocardiography may have to be done by passing a tube into the stomach and examining from inside. This is known as Transesophageal Echocardiography (TEE). This may be necessary in patients who have suspicion of involvement of more than one valve; for example, the mitral valve and tricuspid valve or mitral valve and aortic valve. These tests do not cause much discomfort. Occasionally cardiac catheterization or angiography may be required in older patients. In this a tube is

passed from the groin into the heart where pressure is recorded and x-ray are taken to see the damage caused to the valves. The patient will need to stay in the hospital for a day. CT Scan and MRI Scan may not be required for diagnosis. With echocardiography the severity or seriousness of the problem can also be estimated, in order to recommend proper treatment, When the disease is mild no operation may be required.

Treatment: Generally, patients with heart valve problems develop heart failure. Because of this they retain fluids in the body which causes breathlessness and swelling on the feet. Treatment with medication is meant to improve heart function and to remove fluid from the body. Drugs like Digoxin and others which increases the flow of urine (like Lasix and Ditide) may be prescribed. Patients are also advised to restrict salt intake and fluid intake to 800 ml to 1000 ml (1 liter) per day. This includes fluids such as tea, coffee, fruit juice, milk and water that is taken in a 24-hour period. Seriously ill patients may require to restrict their activity in order to remain symptom free. In patients who have irregular heart beat (Atrial fibrillation). Drugs may be given to reduce the possibility of blood clotting. This will prevent the occurrence of strokes or paralysis. These drugs have to be taken carefully and require constant monitoring. During treatment with these drugs the patient is likely to bleed excessively during menstrual period or if an injury occurs. Operation is recommended for patients who have serious problems. Before operation patients should make sure that they do not have any infection in the teeth or elsewhere such as the ear in children and urinary tract in adults. The patient should be admitted to the hospital a day or two before operation. If your doctor recommends operation, it is better to get it done as early as possible before developing a complication which will require emergency operation with more risk to life. Narrowing of valves such as mitral stenosis (MS) or aortic stenosis (AS) can be opened up without a major operation by using a balloon catheter. This is known as Balloon Valvuloplasty. This is done by the Cardiologist in the Cardiac Catheterization Laboratory. In this procedure a tube is passed from the groin into the heart and maneuvered into the mitral valve. A balloon is passed through this tube into the mitral valve. When the balloon is inflated it forces open the narrowed valve. This operation avoids a scar; however, it is not possible to use this in all patients. This procedure costs between Rs. 230,000 to Rs. 40,000 in various hospitals. This procedure may also fail to open the valve or may cause a tear in the valve resulting in leakage. Such patients may require emergency operation to save their lives.

Operations For Heart Valve Diseases: Narrowing of the Mitral Valve or Mitral Stenosis: The operation for mitral stenosis (MS) is known as Closed Mitral Valvotomy (CMV). It is usually recommended for patients with only narrowing of the valve without calcification and in young patients who have a normal regular heartbeat. The operation can be performed in any major hospital by a qualified surgeon. Here a finger is passed under controlled conditions and an instrument called the dilator is introduced into the valve and the valve is forcibly opened. This operation is more successful than balloon valvuloplasty. This operation costs very less in a hospital like AIIMS and can be done free of charge for poor and needy patients. Patients who have irregular heart beat but do not have a clot in the heart can also undergo this operation provided a Transesophageal Echocardiography (TEE) shows that there is no clot. However, they have to be treated with blood thinning drugs (anticoagulant) for one and a half month before such an operation.

Open Heart Surgery: It the mitral valve is leaking or if the aortic valve is diseased or the tricuspid valve is diseased the patient will need open heart surgery. Here the heart has to be stopped and circulation of blood and oxygenation of blood will be taken over temporarily by a machine (Heart Lung Machine) so that surgeon can look inside the heart and perform a procedure to correct the problem.

Mitral Valve: Open heart surgery on the Mitral valve may be Open Mitral Commissurotomy (OMC), Mitral Valve repair or replacement. Open Mitral Commissurotomy (OMC) is possible if the valve is narrowed and is not calcified.

Mitral Valve Repair: In this operation correction of mitral stenosis (MS) and mitral regurgitation (leaking valves) is done under vision. This operation is suitable for young patients, women and those who do not have calcification. The surgeon will reconstruct the valve so that its function is returned to near normal. The advantage is that the patient retains his own natural valve. He will not require anticoagulant medicine for all his life. He will also not require expensive hospital tests. The operation also costs about ½ to 1/3 of the cost of valve replacement with an artificial valve. This operation is also best suited for young patients,

women and elderly people.

Mitral Valve Replacement: Replacement of the mitral valve becomes necessary when the valve is severely damaged or calcified. It may also be required in patients who are undergoing a second operation. In this, surgeon will remove the mitral valve and replace it with an artificial valve (Prosthetic valve), a valve made from animal tissue (Bio prosthesis or with a human valve taken from a dead person (homograft). The cost of such operation is much more than valve repair, in addition the patient will require to take anticoagulant medicines for the rest of his life. The patient will also require blood and other tests to monitor the function of the valve at regular intervals.

Aortic Valve: In young patients with narrowing of the Aortic valve a balloon dilatation can be done. However, this operation is not very successful. Most patients with aortic valve problem will require open heart surgery. Diseased aortic valve can be repaired or replaced.

Aortic Valve Repair: This operation can be performed only in some centers and by experienced surgeons. It is most difficult. However, it helps the patients to retain his own natural valve. It is also less expensive. The operation may also fail to correct the abnormality permanently. This means that the patient may require a second operation after several years if the valves is damaged again.

Aortic Valve Replacement: The major operation for Aortic Valve disease is aortic valve replacement. In this, surgeon removes the aortic valve and replaces with an artificial valve prosthesis, bioprosthetic valve, homograft or autograft. In young patients and in women and in elderly people it is better to have the valve replaced by human valve (homo-graft) or by the patients won pulmonary valve (Autograft). This operation with homograft or autograft replacement cannot be done in all centers. It can be done only in some centers where the surgeon is experienced and homograft valves are available. The advantages are that this is a natural valve and is expected to function normally. The autograft or the patient's own valves is also likely to grow in children and be free of complications and is therefore the best choice for Aortic valve replacement. In most centers the aortic valve is replaced by an artificial valve (prosthetic valve). Againthe patient needs to be on anticoagulant medication throughout his life after this operation. It is also necessary to take precautions to avoid infection. Prosthetic valve replacement is twice as expensive as homograft or autograft valve replacement.

Tricuspid Valve Repair: The Tricuspid valve is almost always repaired. It does not require replacement. However, minor degree of leakage may persist even after repair.

Complications: In good centers generally, there are no complications. However, because of the nature of the operation and because the heart has to be stopped for a period of time there is a risk to life. This risk may be anywhere between 3 to 15% depending on the type of operation performed. For closed mitral valvotomy the risk to life is less than one per cent. For Mitral valve replacement risk to life is 6-8. For Mitral valve repair it is 4-5%. For Aortic valve replacement it is 3 to 5% and for double valve replacement (Aortic and Mitral Valve) it is 10-12%. In patients who require replacement of Aortic and Mirtal valve and repair of Tricuspid valve risk to life is 15%. Patients may also develop bleeding soon after surgery and may require to be returned to the operating room for stopping bleeding. Damage to brain may cause prolonged unconsciousness and paralysis. Damage to the lungs, liver and kidneys is also possible in the operation. These complications are less in patients who come before heart failure has set in. It is therefore, better to get the operation done at the earliest opportunity after the diagnosis is made. A 60% decline in stroke and 50% decline in coronary artery disease (CAD) mortality over the past 25 years have been documented in the United States, with similar decreases in Finland and many other western countries. The dramatic decline in cardiovascular diseases (CAD) in the West is attributed to aggressive modification of lifestyle by the entire population rather than to high-tech hospital care of individual cardiac patients. Several interventions have been proven or shown likely to alter the risk of CVD. These include those dir5ected at cigarette smoking, diet, and low-density lipoprotein (LDL), hypertension, platelet adhesion, diabetes, physical inactivity, high-density lipoprotein, (HDL), triglycerides, obesity, and estrogen replacement therapy. An epidemic of CAD is underway in India. Life style modification for the entire population as part of a population-based strategy offers the best hope of arresting and reversing the epidemic of CAD among Indians. This strategy aims to reduce the smoking rate and lower the serum cholesterol and blood pressure levels of the entire population by emphasizing the perils of tobacco abuse, the importance of consumption

of healthy foods, and the need for regular exercise. This strategy is more likely to be practical and successful in India than the extensive use of expensive medical technology, which is beyond the reach of the overwhelming majority of Indians. The rise and fall in the CAD mortality in the Western world in the latter half of the …entieth century correlates directly with …anges in lifestyle in the society, rather than changes in the genetic pool. In India, similar lifestyle transformation with …normous significance is taking place; the middle class is undergoing tremendous changes in lifestyle and socioeconomic factors such as acquiring cars and consuming increasing amounts of alcohol and tobacco. Eating patterns are also changing rapidly with greater use of fast foods, meats, and fats. These changes are leading to sedentary habits and increased consumption of unhealthy foods. An epidemic of CAD is already underway in India because of these factors. Experiences in the West clearly show amazing success in reversing the CAD epidemic through aggressive modification of lifestyle. For example, the age-standardized mortality rate (SMR) for CAD in the US has declined by more than 50% in the past 25 years. Of this decline, about 30% is attributed to a modest reduction of serum cholesterol level in the entire American population, mainly through reduced intake of saturated fat. About 24% of the decline is attributed to reduction in smoking and 8% to the treatment of hypertension. Other advances in treatments such as coronary care units, cardiopulmonary resuscitation, coronary angioplasty and bypass surgery have had only a small impact. This review discusses the various aspects of lifestyle modification, which can be implemented immediately with minimal cost in India.

Cardiovascular Risk Factors –Priority for Intervention: The 27th Bethesda Conference on Matching the Intensity of Risk Factor Management with the Hazards for Coronary Disease Events is a landmark document that offers clear guidelines for management of risk factors. The priority of intervention for the various risk factors according to the degree of benefits is given in Table 1.

Crucial Role of Cigarette smoking in cardiovascular diseases: Cessation of smoking is given the top priority. The US Surgeon General's report in 1964 first established the epidemiological relationship between smoking and coronary artery disease. The 1989 Surgeon General's report presented definitive data from observational, case-control, and cohort studies, that smoking increases cardiovascular disease (CVD) mortality by 50%. More importantly, a linear relationship exists between cardiovascular risk and cigarettes consumed. An average smoker dies 3 years earlier than a non-smoker, and a person at "high risk" for CAD (due to other risk factors) dies 10 to 15years earlier if he or she smokes. A patient who continues to smoke after a myocardial infarction (MI) has an increased risk of death and reinfarction ranging from 22 to 47%. Smoking has clearly been implicated in bypass graft atherosclerosis and thrombosis. Continued smoking after a bypass graft is associated with a 2-fold increase in the relative risk of death and MI.

Smoking damages the cardiovascular system in at least two ways. One is a short-term effect produced by agents that have an immediate effect on the circulatory system, probably related to the thrombotic effects of smoking and vasoconstriction caused by nicotine. Smoking exerts its thrombogenic effects by inducing an elevation in blood fibrinogen concentration, enhancing platelet reactivity, and increasing whole blood viscosity by inducing secondary polycythemia. Smoking also accelerates the atherogenic process both in duration and a dose-dependent fashion. The second is a long-term effect, mostly determined by cumulative consumption, probably involving an increased rate of atherosclerosis that may be irreversible. Smoking promotes oxidation of LDL and lowers HDL. Recently, a 10% decrease in HDL levels in children of smoking parents has been reported. Monoclonal proliferation of vascular smooth muscle cells induced by different components of cigarette smoke or their metabolites is yet another mechanism.

Economic burden of Active and Passive Cigarette Smoking: In the US smoking is the leading preventable cause of death killing, 420,000 smokers annually. The total cost of medical services for smokers amounts to 50 billion annually, with another 50 billion in lost wages due to morbidity and mortality associated with smoking. Environmental exposure to second-hand smoke accounts for another 40,000 CAD deaths annually. Parental smoking is an important preventable cause of morbidity and mortality of American children; it result5s in an annual direct medical expenditure of 4.6 billion and loss-of-life cost of 8.2 billion. These startling data provide additional reason for elimination of smoking by parents of young children. No wonder the US tobacco companies were eager to reach an agreement to pay 368.5 billion in return for

immunity from litigation in the US courts and to cover the cost associated with the treatment of tobacco-related health problems!

Economic and Health Benefits of Smoking Reduction: Clinical data accumulated over the past 20 years strongly suggest that smoking cessation reduces the of CVD events. The impacts of smoking cessation accrue rapidly when heart disease and stroke are considered. The excess risk of MI or stroke falls by 50% within the first 2 years after stopping smoking. The decline in risk of overall CVD mortality is greatest in the several months after smoking cessation and continues to decline more gradually over the ensuing several years. Early benefit may derive from improving the prothrombotic state or result of retarding or reversing the progression of atheromata. In the US, it has been estimated that with a 1% reduction in smoking prevalence there would be 924 fewer hospitalizations for MI and 538 for stroke, resulting in an immediate savings of 44 million, in the first year alone. A seven-year program that reduces smoking prevalence by 1% reduction in smoking prevalence there would be 924 fever hospitalizations for MI and 538 for stroke, resulting in an immediate saving s of 44 million, in the first year alone. A seven-year program that reduces smoking prevalence by 1% per year would result in a total of 63,840 fewer hospitalization for Mi and 34,366 fewer for stroke, resulting in a total savings of 3.20 bi8llion in costs and would prevent 13,100 out-of-hospital cardiac deaths. Creating a new nonsmoker reduces anticipated medical costs associated with MI and stroke by 47 in the first year and by 853 during the next seven years. This degree of smoking reduction was successfully achieved in California, where the Proposition 99 Anti-tobacco Education Program accelerated the historical decline in smoking prevalence by 1% per year for the past seven years. A somewhat similar reduction in smoking was achieved by raising taxes on tobacco in Canada, where most adolescent children cannot afford to buy a pack of cigarettes that cost more than $4.

Differing Trends in smoking rates in East and West: Cigarette smoking has been declining in North America and Western Europe, but rapidly increasing in Eastern Europe and Asia. For example, over the past 30 years, the smoking rate in the US has come down from 55% to 29% in men and from 33% to 23%in women. America cigarette exports have grown 260% in the past decade, more than 40% of US tobacco exports are sole in Asia, where smoking rates remain high. Three-fourths of the Vietnamese men and two-thirds of the Chinese and Japanese men are cigarette smokers. Cigarette smoking is an important health problem in India where tobacco is used in many different ways such as bidi, Zarda, Gutka, huka, and betel leaves, in addition to cigarettes. The decline in cigarette smoking in the US has recently leveled off and some preliminary data suggest more American girls than boys are smoking cigarette. President Clinton has initiated a national campaign to reduce the smoking rates in children by 60% in the next 10 years. His proposal includes an increase in price and or tax of $1.50 per pack to make cigarettes unaffordable to children. There is an urgent need for such an initiative in India since tobacco use typically begins in childhood and nonsmoking children rarely become adult smokers.

Table 1: Cardiovascular Risk Factors. Priority for Intervention	
Class 1: Factors for which interventions have been proved to lower coronary artery disease risk. Class 2: Factors for which interventions are likely to lower coronary artery disease risk. Class 3: Factors that, if modified, might lower coronary artery disease risk. Class 4: Factors that cannot be modified or for which modification would be unlikely to lower coronary artery disease risk.	
Class 1 Cigarette Smoking	Class 3 Psychosocial factors

High LDL Cholesterol High fat/cholesterol diet Hypertension Left ventricular hypertrophy (LVH) Thrombogenic factors	Lipoprotein (a) Homocysteine Oxidative stress No alcohol consumption.
Class 2 Diabetes mellitus Physical inactivity Low HDL cholesterol High triglycerides; small, dense LDL Obesity Postmenopausal status (women)	Class 4 Age Male gender Low socioeconomic status Family history of early-onset CVD

Intervention Strategies for Smoking Cessation: Although more than 80% of smokers are aware that smoking has adverse health effects. Many underestimate the hazards. The different intervention strategies include self-help, physician advice or nurse counseling to quit, and pharmacological therapy such as transdermal nicotine patch, nicotine gum, clonidine, etc. These interventions can be combined for better results. The smokers may be motivated to quit if the self-help materials such as those prepared by the American Heart Association, American Lung Association and American Cancer Society are widely disseminated. It is estimated that 90% of Americans who successfully quit smoking do so using individual methods of smoking cessation rather than organized programs. This does not imply that other types of smoking cessation interventions are not necessary. Organized smoking cessation programs may be more helpful for heavy smokers. Most smokers who quit using self-help strategies may relapse, but this should not be viewed as a failure. It may be reassuring to know that, on an average, smokers attempt to quit three or four times before they maintain abstinence. Predictors of the outcome of smoking cessation efforts are Motivation to quit; intention to quit; confidence in quitting; and degree of nicotine addiction. The doctor's role in encouraging the patient to quit cigarette and beedi is given in Table 2.

Table 2: Physician Counseling guidelines for smoking Cessation
• Ask about smoking at every clinical visit • Advise all smokers to stop • Assist the patient by advising a quit date and providing self-help materials • Arrange follow-up visits to assess smoking status and encourage continued abstinence

Dietary Modifications: The results of 50 years of intensive research worldwide support the conclusion that diet is the major environmental cause of atherosclerosis and cardiovascular diseases. A high caloric density of diet, often due to high fat content combined with limited physical activity, contributes to obesity, insulin resistance, and dyslipidemia. All these abnormalities increase the risk of CAD. Salt intake in susceptible persons is associated with elevated blood pressure, the foremost risk factor for stroke.

Dominant Role of Serum Cholesterol in CAD: Elevated serum cholesterol level is the strongest risk factor for CAD. The mean level of cholesterol in umbilical blood of newborns worldwide is 75 mg/dl, which rises to 150 mg/dl in two weeks and remains at that level until approximately 20 years of age, when it starts to gradually rise again in most populations. However, in most native African, Latin American, and many Asian populations, the serum levels of cholesterol do not rise. These groups have a virtual absence of CAD. For example, despite a very high prevalence of hypertension and cigarette smoking, the Cad rate in China is one eighth, and Japan one tenth, the CAD rate of the UK. Yet, a 1% difference in the level of serum

cholesterol results in a 3% difference in the risk of CAD even within the desirable range of cholesterol level. For an extreme example, an increase in blood cholesterol from 147 mg/dl to 182 mg/dl among Chinese in Shanghai is associated with a 4-fold increase in CAD. The difference in the levels of serum cholesterol ranging from 116 mg/dl in rural China to 235 mg/dl in urban UK offer the best plausible explanation for the 13-fold difference in CAD rates among different population. Therefore, the optimum level of cholesterol appears to be 150 to 160 mg/dl, especially for Asians, much lower than the 200 mg/dl considered desirable in the Western society.

Fats and Fatty Acids: Contrary to common belief, the contribution of dietary cholesterol to serum cholesterol is small (<10 mg/dl). The average adult American and European consume daily about 500 mg of cholesterol (about the size of five toothpicks), which is hardly a calorie. On the contrary, dietary fat contributes to as much as 100 mg/dl of serum cholesterol. Fats are substances composed of a combination of fatty acids, which are classified as saturated (SAFA), monounsaturated (MUFA) or polyunsaturated (PUFA), depending upon the location and number of double bonds. ^Dietary excess of SAFAs is the largest contributor to serum cholesterol worldwide. SAFAs suppress LDL receptor activity, resulting in marked elevation of LDL. Substitution of 1% carbohydrate calories with SAFAs raises cholesterol by approximately 1.5 mg/dl, whereas PUFAs and MUFAs lower it by 0.5 mg/dl. SAFAs also increase HDL, and PUGAs decrease it; MUFAs are neutral on HDL.

Table 3: Atherogenicity, Thrombogenicity and Percentage of Fatty Acids in Common Cooking Oils and Dietary Fats

Oil/ fat	**PUFA**	**MUFA**	**SAFA**	**LDLResponse in mg/dl**	**Index of Atherogenicity**	**Index of Thrombogenicity**
Coconut Oil	2	6	92	+36	13.63	6.18
Palm Oil	10	40	50	+12	0.88	1.74
Olive Oil	11	72	17	-15	0.14	0.32
Soybean Oil	61	24	15	-24	NA	NA
Peanut Oil	32	50	14	NA	NA	NA
Corn Oil	59	28	13	-24	NA	NA
Sunflower Oil	96	19	12	-30	0.07	0.28
Safflower Oil	78	13	9	-30	NA	NA
Canola Oil	32	62	6	-25	NA	NA
Beef fat	2	39	51	+5	0.72	1.06
Pork fat (lard)	10	45	51	0	0.60	1.37
Butter fat	3	28	69	+5	2.03	2.07
British Diet	NA	NA	NA	NA	0.93	1.21

The current US caloric intake averages 34% total fat, 14% MUFA, 12% SAFA, and 6% PUFA. The recommended fat intake is <30% of the calories, with up to 15% from MUFA, up to 10% from PUFA and the remainder from SAFA (< 10% in Step I and <7% in Step II diet). Since the average consumption of fat in India is much lower than in the West (about 20-25% of the calories), this dietary guideline may be too liberal. About 7% to 8% of calories from each of the three fatty acid categories appear to be more appropriate for Indians.

Atherogenic Effects of SAFAs: Whereas serum cholesterol is the strongest risk factor for CAD, SAFAs are its largest contributor. Therefore, SAFAs are the essential predisposing factor fro CAD, acting through both atherogenic and thrombogenic mechanisms. However, only three SAFAs with chain lengths 12-16 have cholesterol-raising properties. These are lauric acid (C12:0), myristic acid (C14:0) and palmitic acid (C16:0). These three fatty acids account for only 25-30% of the total fat but 60-70% of SAFAs, in Western diets.

Palmiticx acid is the principal SAFA in palm oil and animal fats. Myristic acid is the most powerful cholesterol-raising SAFA, being capable of raising LDL from 70 mg/dl to 200 mg/dl. The cholesterol-raising ability of myristic acid is 50% more, and lauric acid is 33% less, than that of palmitic acid, the most common fatty acid in human diet. Replacement of 1% of energy from carbohydrate by 1% energy from myristic acid raises blood cholesterol by 2.3 mg/dl, compared to 1.5 mg/dl with palmitic and 1.0 mg/dl with lauric acid. Most of the risk in cholesterol is due to an increase in LDL, the respective contribution from HDL being 0.8 mg/dl, 0.4 mg/dl and 0.6 mg/dl. 13 Lauric acid is the principal SAFA in coconut and palm kernel oils, both containing 49%. The major sources of myristic acid are butter, coconut oil, and palm kernel oil, each containing about 18%. These three fats are more atherogenic and thrombogenic than lard and beef tallow, the latter two containing only 2 to 3% of myristic acid. Atherogenicity and thrombogenicity and the percentages of various fatty acids in common cooking oils are provided in Table

3. Antiatherogenic effects of MUFAs: Diets high in MUFAs (loeic acid C18”1) restore LDL receptor activity and lower cholesterol. In Mediterranean countries, the high intake of MUFAs in the form of olive oil is inversely related to CAD as well as total mortality. A diet high in oleic acid generates LDL that is resistant to oxidation, and decreases thrombogenicity by lowering Plasminogen Activator Inhibitor (PAI-I) levels. Olive oil and canola oil are rich sources of MUGA, but meat and dairy products, which are also rich in SAFAs, provide most of the MUFAs in the Western diet. Mustard oil is high in MUFAs but also high in erucic acid, which is known to have toxic effects on the heart.

Antiatherogenic Effects of Omega-…… PUFAs: Linoleic acid (C18:2), the major fatty acid in omega-6 PUFAs, inhibits the hepatia synthesis of apo B-xontaining lipoproteins and lowers serum cholesterol by 2.0 mg/dl for every 1% of the SAFA calories substituted. Between 1963 and 1990 the CAD mortality rate in the US declined by 54%. About a third of this decline is attributed to an increase in the consumption of PUFA from 3% to 6% of the calories, resulting in a 6% to 8% decrease in population level of serum cholesterol. Vegetable oils such as soybean, corn and cottonseed are primary sources of -6 PUFA and its average consumption in the Western diet is 6% to 8% of the calories. The two undesirable effects of PUFA are lowering of HDL and increased susceptibility for peroxidation.

The Anti-thrombogenic Effects of Omega-3 PUFAs: The principal effect of increased intake of omega-3 PUFAs is antithrombogenic, whereas that of omega-6 PUFA is antiatherogenic. Dietary consumption of omega-3 PUFAs reduces platelet and monocyte reactivity, lowers blood pressure, and lowers blood levels of triglycerides and homocysteine. Rich sources of omega-3 PUFAs include walnuts, canola oil, soybean oil, and fatty fish (sardine, salmon, mackerel, etc.). Recently an intake of one fatty fishmeal per week such as 80 g of salmon was shown to reduce the risk of primary cardiac arrest by 50%. In a secondary prevention trial of 605 French men recovering from MI, there was a 70% reduction in total and cardiac death during a follow-up of 27 months in those who received an experimental “Mediterranean diet” using canola oil-based margarine, enriched with omega-3 PUFA. Since a very high ratio of omega-6 to omega-3 PUFA increases thrombogenicity, a ratio of 4 to 55 appears to be optimum in reducing the risk of CAD.

Table 4: Eating Pattern: General Guidelines (DHHS/AHA/NCEP)
• Avoid too much fat, saturated fatty acids, and cholesterol • Eat foods with adequate complex carbohydrates and starch • Avoid too much simple sugar • Avoid too much sodium • If you drink alcoholic beverages, do so in moderation - 1 drink for women - 2 drinks for men • Eat a variety of foods - Dietary energy (calorie) levels needed to reach or maintain a desirable body weight and waist. - An average of 30% of total calories or less from all fat (20-25% for Indians) - Less than 10% of total calories from saturated fatty acids (7-8% for Indians) - Less than 200 mg of cholesterol per day

Atherogenic Effects of Trans Saturated Fatty Acids (TRAFAs): Hydrogenation of vegetable oils converts

some PUFAs to TRAFAs (elaidic acid), which have a significant adverse effect on lipoproteins. These include a decrease in HDL and increases in LDL, triglycerides, and lipoprotein (a). TRAFAs in the West are doughnuts, Danish pastry, fried chicken, vegetable shortenings, and hard margarine. Butter contains 60% SAFAs, whereas stick margarine contains only 16% TRAFAs and the tub form even less. Therefore, the fat spread of choice is soft margarine. The impact of TRAFAs on the American diet is small as it contributes only 2% of the calories, but may be higher in those developing countries where unhealthy margarine containing 50% TRAFAs is sold. Therefore, the TRAFA content of vegetable ghee and other hydrogenated fats in India deserves scientific scrutiny.

Antioxidants: Extensive laboratory data indicate that the oxidative modification of LDL accelerates the atherogenic process by recruiting monocyte macrophage, stimulating autoantibodies, stimulating LDL uptake by macrophages and increasing vascular tone and coagulability. Iron, copper, zinc and SAFAs all are likely to increase oxidative potential, whereas antioxidants, both in vivo and in vitro, can increase LDL resistance to oxidation. In epicemiological studies, diets high in vitamin C, vitamin E and beta-carotene are protective against coronary heart disease with the clearest effect for vitamin E Many other dietary and non-dietary factors may reduce LDL oxidation, including selenium, estrogen, flavenoids, magnesium and monosaturated fat. The value of vitamin supplementation continues to be unresolved. Although the Finnish Alpha-Tocopherol Beta-Carotene Cancer Prevention Study failed to lower the CAD risk among middle-aged male smokers, the Cambridge Heart Antioxidant (CHAOS) Study has clearly demonstrated a 47% reduction in recurrent clinical events in CAD patients who received Vitamin E at a daily dose of 400 to 800 IU. Despite these uncertainties, about 44% of the cardiologists in the US routinely take antioxidants and 37% of them recommend it to their patients. In addition, 28% of these cardiologists take both antioxidants and aspirin, virtually all of them prophylactically. Only 2% of them had CAD and the remainder had a very low risk factor profile.

Food for the Heart: The greatest reductions in the risk of CAD can be achieved by lowering the serum cholesterol level by reducing the intake of SAFAs. This goal is best accomplished by avoiding butter and ghee, replacing full fat milk with skim milk, and consuming less of dairy fat, and more of fatty fish and fiber-rich foods. No more than two servings a day of lean meat and shellfish may be used. One serving is 2 oz – the size of a woman's palm or a deck of cards. In-creased consumption of MUFAs such as canola (low erucic acid), olive, high-oleic varieties of safflower or sunflower oils is advisable. Unless and until a beneficial effect is clearly demonstrated, the liberal use of palm oil and coconut products should be discouraged, especially in those whose diet contains other sources of SAFAs. However, in those with negligible intake of fish, meat, milk and dairy fat, modest use (>5% of the calories) of such oils may be preferable to no fat at all. Anti-thrombogenic effects of omega-3 PUFAs may be critically important in the middle-aged to prevent heart attacks. This is hest accomplished by the weekly or bi-weekly use of fatty fish (like salmon, mackerel, farm-raised catfish, etc). Consumption of fish is preferable to taking large number of fish oil capsules. Similarly, daily consumption of five or more servings of fruits and vegetables would provide most of the necessary antioxidants and are preferable to vitamin supplements. Several studies have shown that a diet rich in fruit and vegetables and low in SAFAs and high-fat dairy products can substantially lower blood pressure. Since fruits and vegetables are rich in potassium, a liberal intake of these foods can be recommended for the prevention and treatment of hypertension, especially in those who are unable to reduce their intake of sodium. Good sources of potassium include bananas, orange, backed potato, beans, fish, and dairy products, while you can get an overdose of potassium from pills, you can't get an overdose of potassium from food. General dietary guidelines are given in Table 4.

Physical Activity and Exercise: Physical inactivity has recently become a major target of preventive medicine. Approximately 12% of the premature mortality in the US is attributable to physical inactivity, which is associated with at least a 2-fold increase in the risk for CAD. It is difficult to measure physical activity, and consequently, it is difficult to quantify the relationship between the amount of exercise and CAD risk. Nevertheless, over 50 studies have established that physical activity, either on the job or during leisure time, reduces the risk of CAD events in both men and women. Reduction in the risk appears to be

greatest between non-active and moderately active individuals. Less benefit occurs with increases from moderate to extreme amounts of total energy expenditure. Although any physical activity appears to be of benefit, those activities of higher intensity (>7 Kcal/min) such as brisk walking. Jogging, or heavy gardening appear to be more protective. Studies have suggested that the "blood thinning" effects of exercise provide another reason for patients to stay active. Exercise probably exerts its beneficial effect through a variety of direct and indirect mechanisms. Physical training improves the myocardial supply/demand relationship, lowers triglycerides, raises HDL cholesterol, lowers blood pressure, decreases platelet aggregation and improves other clotting factors. Studies of exercise in both animals and humans with established coronary atherosclerosis demonstrate slowing of atherosclerotic progression, and in some circumstances, actual reversal of the process. Several meta-analyses of randomized trials support a 20 to 30% reduction in coronary disease deaths with regular aerobic exercise. In addition to preventing heart disease, exercise can also lower blood pressure and prevent stroke, diabetes, osteoporosis, osteoarthritis and possibly colon cancer and breast cancer. The following guidelines will help you stay physically active without much exertion. • Take a walk after dinner instead of watching television. • Take an activity break at work-get up and stretch, walk around and give your muscles and mind a chance to relax. •Take the stairs in lieu of the elevator. •Walk instead of driving short distances •Use fewer labor-saving devices, doing housework or yard work •Become more physically active throughout the day.

The Role of the Physician in Increasing Physical Activity: Sedentary living is a serious and pervasive health problem. Getting patients moving is always a challenge. Many sedentary patients would like to become more active but do not know how to begin. Perceived lack of time is the most commonly cited barrier to participation. Many persons can readily insert shorter bouts of lifestyle activity into busy schedules. Remember that doing something is better than nothing. The American College of Sports Medicine, Center for Disease Control, and the US Surgeon General have jointly recommended that "Physicians should routinely counsel sedentary patients to accumulate 30 minutes of moderate-intensity activity, equivalent to walking at 3 to 4 mph, for most healthy adults – on most, preferably all, days of the week. "Many physicians do not feel adequately prepared to prescribe exercise to their patients. The counseling style for exercise has to be empathetic, supportive and encouraging. Once the stage is set, it is best to establish small, attainable initial goals with the patient. The prescription should be very specific, achievable, and realistic (Table 5). Recording prescribed physical activity in patient charts can help with follow-up office visits, since despite the best intentions, many persons who begin an exercise program will not stay with it over time.

Obesity: Obesity is one of the most inconsistent risk factors of CAD. Obesity is a predictor of CAD in univariate analysis, but not when serum lipids, diabetes and hypertension are included in multivariate analyses. Analysis of the relationship is difficult because obesity itself predisposes to diabetes, hypertension, decreased HDL and increased triglyceride concentrations. Obesity also predisposes one to avoid exercise. The current availability of highly palatable, calorically dense foods combined with a sedentary lifestyle promote weight gain. If the daily caloric intake exceeded expenditure by 5%, the result would be an increase of approximately 20 lbs. in a year. Obesity in childhood appears to increase the risk of subsequent morbidity, whether or not obesity persists into adulthood. Obesity is a cholesterol-dependent risk factor, not an independent risk factor. The total number of calories is an important factor from the standpoint of body weight, but fat calories or fat grams is the important item from the standpoint of atherosclerotic disease. Snacks just before bedtime are rarely fat or calorie-friendly except that fruit snacks are permitted for those who take an early dinner (typically Americans eat dinner between 5:30 and 6:30 P.M.). Smoking and alcohol consumption are inversely associated with adiposity. No study has specifically examined the effect of weight loss or the type of weight loss on coronary artery disease events. However, deficit of 500 to 600 Kcal per day is usually well tolerated. A combination of diet and exercise is more effective than either alone. Although a body mass index (BMI) of >27 is considered normal, recent data suggest that a BMI of > 22 is the optimum. An increase of BMI from > 21 to > 27 is associated with a 3-fole increase in risk of CAD in women and a 6-fold increase in risk of diabetes in men. There is no better

monitor for fat consumption than body weight. Distribution of body fat rather than the absolute weight appears to be a more important predictor of heart disease, with truncal distribution of body fat being worse than peripheral distribution. Visceral (central, abdominal, or apple-type) obesity, which can be quantified by the waist to hip ratio (WHR), is a precursor to insulin resistance and hypertension. This pattern has been shown to markedly increase CAD risk. The desirable WHR is < 0.9 for men and <0.8 for women. It is uncertain if hip circumference yields any useful information, waist circumference as the sole measurement has been recommended. The metabolic complications of obesity increase when the waist circumference is >80 cms in women men and > 94 cms in men. The risk is substantially increased if this circumference is > 88 cms in women and > 102 cms in men.

Postmenopausal Status: Although CAD develops about a decade later in women than in men, more women than men die from CAD in the US. Endogenous estrogen not only protects against the development of coronary atherosclerosis, but also prevents plaque rapture and MI. Estrogen might also have a direct effect on the vessel wall. Case-control and cohort studies suggest that postmenopausal estrogen replacement result in a 50% reduction in the risk of developing CAD. The reduction risk is even greater fro subsequent coronary events among women with established coronary disease. Estrogen replacement therapy (ERT) raises HDL and lowers LDL, although it modestly elevates serum triglycerides. ERT can lower elevated lipoprotein by 50%. Since Indian women have high rates of CAD and high levels of lipoprotein, ERT should be given strong consideration in postmenopausal women with or at high risk of CAD.

Alcohol: **Moderate alcohol consumption** – one or two drinks per day appear to reduce the risk of Cad by 40 to 50%. All alcoholic beverages (wine, beer and spirits) probably protect against CAD and additional protection by specific beverages are minor. Beer and wine appear to have the same protective effect, and red wine is not more protective than white wine. The apparent differences in benefits in different studies are related to user traits and drinking patterns. For example, men drink more than women. American men are more likely to drink liquor or beer, whereas some women are more likely to drink wine. Wine drinkers have the largest proportion of whites and college graduates and the smallest proportions of smokers; beer drinkers are generally heavier drinkers, and persons with high drinking variability.

Mechanism of benefits of Alcohol: Among populations with high cholesterol and fat intake, such as the French, wine consumption is more strongly related to reduced risk of CAD than is total alcohol consumption. Both red wine and grape wine inhibit platelet activity in vivo, lending credence to the idea that some derivative of grape juice is beneficial. Alcohol appears predominantly to reduce the incidence of Mi and sudden cardiac death and has less effect on the incidence of angina pectoris. This may be due to alcohol's effect on vascular reactivity or on homeostatic factors, thereby reducing acute events rather than reducing coronary atherosclerosis progression. About 50% of the benefits of alcohol are due to raising HDL (both HDL2 and HDL3 subtypes). However, the benefits appear to be limited to those with low HDL (<40 mg/dl) or high LDL (>200 mg/dl). An additional 18% of the cardiac protection is attributable to a decrease in LDL, but this is counterbalanced by a 17% increase in risk due to increased systolic blood pressure. The regular use of three or more drinks of alcohol per day is an important risk factor for hypertension. As much as 10% of hypertension is attributable to alcohol, more than all the secondary causes of hypertension considered together. Thus, although alcohol is a vasodilator at low doses, it is a pressor at high does.

Dangers of Alcohol Excess: There is no doubt that heavy alcohol use is harmful because of adverse effects on the lover, heart (alcoholic cardiomyopathy, hypertension and arrhytghmia), and other organs. The adverse effect of alcohol appears to be more concentrated in people of low socio-economic status. In addition, alcohol consumption tends to occur along with other activities like smoking cigarettes, which has implications for the heart and other organs. Heavy drinkers are more likely than teetotalers to smoke cigarettes and engage in unhealthy behaviors, which consequently increases the risk to death from all causes. Alcohol intake is hard to measure and information about its consumption obtained at any one time may be misleading as a measure of long-term alcohol exposure. The recent documentation of a decrease in longevity in Russia is attributed to alcohol abuse. Russians have one of the highest annual per person

alcohol consumption rates (14 liters), and they often engage in binge drinking, a behavior that increases the risk of stroke, cardiac arrhythmia, and fatal alcohol poisoning. A recent Finish study has shown that men who drink 6 or more bottle of beer at a time hve a substantially higher risk of death (3-fold higher all-cause death: 7-fold higher death from violence, suicides, injuries, poisoning; and 7-fold higher fatal MI) after adjusting for age and total alcohol consumption. While the choice of whether or not to drink alcohol remains a personal one, the following guidelines may be helpful: People who do not drink at all should not start. Light to moderate drinkers should feel sate in continuing one or two drinks per day, but never more than three drinks at a time. Heavy drinkers should reduce their intake of alcohol, and if they cannot control their drinking, they should stop altogether. In France, renowned for liberal consumption of wine and no guidelines for drinking, the following motto has been popular; "One glass is OK. Two glasses are too much, Three glasses spell trouble. "Drinking should not be anyone's main strategy for preventing CAD.

Dramatic Reduction in CVD Rates from Lifestyle Modification: **Lessons from Finland**: In the north Karelia and Kuopio provinces of Finland, the CAD mortality declined between 1972 and 1992 by 55% in men and 68% in women. The changes in three major risk factors during the 20 years explained 43% decline in men and 49% in women and underscore the tremendous benefits of smoking cessation, controlling blood pressure, and lowering cholesterol. In men, the relative role of the three risk factors is as follows: 26% decline in CAD mortality for a 13% decrease in serum cholesterol level; 15% decline for a 9% decrease in diastolic blood pressure; 10% decline for a 16% decrease in smoking. The greater than expected decline in CAD mortality may have been due to modification of other risk factors such as physical inactivity, obesity, dietary pattern, and flavonoid intake, the impact of which were not analyzed.

Other Interventions to Reduce CVD Burden: A variety of other intervention have been documented to drastically reduce the risk of CVD. An estimate of benefits from various interventions in reducing the risk of a first Mi is given in Table6. Maintaining ideal body weight, avoiding tobacco and exercising daily can halve the risk of a CVD event. Further halving of the CVD risk can be achieved by a 10% reduction in serum cholesterol and 10% increase in HDL, along with low dose aspirin and estrogen replacement therapy (in postmenopausal women). The benefits of these interventions appear to be far greater than that of coronary revascularization procedures. Although such procedures are highly effective in relieving severe angina, their impact on preventing MI or death is small. Safe and effective medications are also now available to lower LDL by as much 60%, in those who are unsuccessful was maximum modification of lifestyle.

Conclusion: Diabetes mellitus, atherosclerosis hyperlipidemia, hypertension, physical inactivity, obesity, and insulin resistance are highly interrelated. Each is an independent risk factor fro atherosclerotic events, although the pathogenic mechanisms involved are unresolved. The magnitude of the risk reduction with exercise, diet, lipid modification, and smoking cessation is similar to other medical therapies fro CAD such as aspirin, beta-blockers, and coronary bypass surgery. Smoking is perhaps the most important and least genetic of all risk factors. Smoking augments the severity of other risk factors such as dyslipidemia and hypertension and markedly increases the incidence of and mortality from CAD. A prescription for your health is "Live an active life feels better, look better and work better".

Reference: 1A socio psychological study of patients undergone open heart surgery PhD thesis of Soumen Acharya 1995 JMI

Early Antenatal Care Visits Among Pregnant Women Attending Antenatal Care in Rural Gambia: Prevalence and Determinants

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Abstract: In 2018, there were reportedly 303,000 maternal fatalities worldwide. The maternal mortality rate in The Gambia is also said to be 400 deaths per 100,000 live births. 24 percent of expectant Gambian mothers receive prenatal care four times. 79% of births take place in hospitals, and 24% of them need medical assistance. The key factors contributing to Gambia's rising maternal and neonatal death rate include a lack of awareness about ANC services. The main objective of the study was to determine what characteristics affect pregnant women in rural Gambia who get early prenatal care. The research employed a cross-sectional community-based survey using standardized questionnaires. A specified questionnaire was used to collect respondents' primary data, and cluster random selection was employed to choose samples from 5 different districts. The study discovered that early ANC attendance in rural Gambia was impacted by the majority of socioeconomic variables, a small number of economic factors, and accessibility to prenatal care service centers. Following multivariate analysis, there is a strong correlation between early ANC attendance and marital status, the number of children, the mother's employment, cultural acceptability, and educational attainment. The high mother and child mortalities seen in the Foni districts are explained by the district's relatively low early ANC attendance as compared to WHO standards and falling short of the national threshold (>80%). Sadly, despite the fact that the study indicated high understanding of ANC services, this did not boost ANC attendance rates.

Keywords: Antenatal Care Visit, Early ANC Attendance, Pregnant Women, Rural Gambia, Determinants

1. Introduction: Antenatal care is one of the most significant health interventions for reducing mother and child mortality and morbidity by establishing a personalized delivery plan and anticipating complications (MoH The Gambia, 2021; NaNA, 2019) Pregnant women should receive ANC at least four times during their pregnancy, according to the World Health Organization. Early antenatal checkups allow health professionals to manage and discover pregnancy-related problems early on. It also provides tetanus toxoid immunization, malaria intermittent preventative treatment, nutritional supplementation, and birth preparation services [4]–[6]. Over the last twenty-five years, the global maternal death rate has decreased by roughly 44%, from approximately 532,000 in 1990 to an estimated 303,000 in 2015. Majority (99%) of maternal deaths worldwide occurs in developing nations, and The Gambia is no exception. Sub-Saharan Africa is home to 66 percent of the world's population [7]. To reduce morbidity and mortality, the third Sustainable Development Goal (SDG3) aims to promote maternal and newborn health and welfare. In Africa, direct obstetric causes accounted for 73% of all maternal fatalities, whereas indirect obstetric causes accounted for 27% of all maternal mortalities [8]–[11]. Postnatal hemorrhage (27.1%), hypertensive disorders of pregnancy (14.1%), the effects of botched abortion (7.9%), obstructed labor (9.6%), and infection are the leading causes of maternal death in Africa [7], [12]. 86 percent of pregnant women worldwide get access to good prenatal care at least once [7], [13]. In Sub-Saharan Africa, where the majority of maternal deaths occur, just 52% of pregnant women have at least four prenatal visits [13]–[15]. In The Gambia, 24 percent of pregnant women receive antenatal treatment at least four times (GDHS, 2019/20). The Gambia Health and Demographic Survey reported that 79% of women deliver at a major health facility and 21% deliver at home. From the same source, 67% of all pregnant women in the rural area do ANC visits either at the end of their second trimester or in the beginning of their third trimester. Furthermore, 15% of pregnant women who have had miscarriages have limited access to post-abortion care [13], [16]. According to study conducted by (B. Manjang, 2022), women who received antenatal care earlier had a seven-fold increased risk of giving birth in a health institution. Focused prenatal care is underutilized by many African women. They frequently arrive late for ANC services and attend fewer prenatal care visits than advised [6], [17], [18]. In most of Sub-Saharan Africa, maternal and child health care remains a major issue, with maternal mortality estimated at 546 per 100,000 people in 2019 (GDHS, 2019/20; MICS, 2018). The Gambia's maternal mortality rate is around 400 deaths per 100,000 live births (GDHS, 2019/20). This is significantly higher than Kenya's rate of 316 fatalities per 100,000 live births. In fact, it is believed that one out of every nine women in The Gambia dies because of pregnancy-related complications (UNICEF, 2021). One out of every ten Gambian children dies before reaching the age of one. Antenatal care coverage in The Gambia for at least four visits in rural Gambia is 41% this is low compared

to neighboring countries such as Senegal, which is 58 % (GDHS, 2019/20; SDHS, 2019). Around 3.2 million women and men in The Gambia need emergency health services [1]. In 2020 under five mortality rates in The Gambia were 62.74 deaths per 1000 live birth [3]. Anemia affects 44 percent of women of reproductive age, and 55.8% of children under the age of five [22]. Furthermore, there were over 20,000 confirmed malaria cases, raising the risk of low birth weight and complications during pregnancy [5], [15], [23]. **2. Methods: 2.1. Research Design**: This study used a descriptive cross-sectional community-based survey with structured questionnaires. This is because the researcher intends to determine the frequency (prevalence) of a particular attribute (determinants of early antenatal care attendance), in a defined population (pregnant women) at a particular point in time. This is because cross sectional community-based studies are usually conducted relatively faster and are inexpensive. 2.2 Population and Sample: In the Fonis, the study's target group was women of reproductive age aged 15 to 49. The sample for the study was only pregnant women within the Fonis. 2.2.1 Sampling Technique: The Fonis were purposively selected for the study the reason was that Fonis are among the top five districts with high maternal and infant mortalities. The district has more than 50 villages which was erratically picked for the research using pieces of paper which were folded using simple random sampling. The respondents were then drawn from the houses using systematic random sampling with a 5-point interval or a predetermined interval. The first respondent from the household is selected using simple random sampling through folded pieces of paper. The villages' fifth household is chosen for an interview, and so on, until the necessary number of responders has been attained. The number of respondents selected from each household is proportional to the number of households in the villages and the total sample size for the study was 384 pregnant women as respondents. **2.2.2 Inclusion/Eligibility and Exclusion Criteria:** The study included pregnant women between the ages of 15 and 49 who had lived in the area (Fonis) for at least a year and are willing to participate in the study. The study excluded those are not pregnant women who and also pregnant women within the reproductive age but are not willing to participate, very ill women and thus not able to participate.

2.2.3 Data Collection Tools: The research used a well-structured questionnaire to collect data from primary respondents. Trained research assistants will be recruited (if necessary) to interview the respondents. Closed and open-ended questionnaires will be used to collect information from the respondents. The questionnaire was pretested in Brikama, a city in west coast region, in The Gambia which has the same characteristics with the Foni districts. 20 pregnant women were used as respondents for the pretesting. **2.2.4 Data Coding and Analysis**: Data analysis of quantitative raw data from questionnaires was done by coding the data using epi data. The coded data was entered into SPSS 22.0 data entry program and then analyzed. The statistical mode such as chi-square test and multivariate logistic regression was used determine the relationship between the variables. In the study, estimated mean age was 24 years.

2.2.5 Multivariate Analysis: Multivariate analysis was conducted on seven variables which initially has a statistical relationship during the bivariate analysis using Pearson's Correlation coefficient and linear regressions.

3. Results and Discussion: The study administered 384 questionnaires to pregnant women. The study was conducted between January 2022 and March 2022. Questionnaires that had been properly filled out and returned were considered and analyzed. Following data validation and cleaning, 384 surveys representing a 100% response rate were considered suitable for study.

Table 1: Characteristics of Respondents in relation to ANC Services provided in rural Gambia

Variable	Frequency	Percentage
Age of the pregnant woman		
15-24	100	**26.0**
25-29	116	30.2
30-34	95	24.7
35-39	46	11.9
40-44	16	4.1
45-49	11	2.9
Marital Status		
Married	286	74.5
Divorced	70	18.2

Widowed	18	4.7
Separated	10	2.6
Level of Education		
No formal education	169	44.0
Primary	170	44.2
Secondary	42	10.9
Tertiary	3	0.78
Number of Deliveries (Parity)		
One	26	6.8
Two	60	15.6
Three	133	34.6
Four	62	16.1
Five	48	12.5
Six or more	55	14.3
Respondent's Occupation		
Housewife	284	73.9
Businesswoman	59	15.4
Unemployed	36	9.4
Employed	5	1.3
Level of Household Income in dollars ($)		
<50	79	21.3
50-100	142	38.3
150-200	93	25.0
200-250	35	9.4
> 250	22	5.9
Distance to the nearest ANC Center (KM)		
< 5	111	28.9
6-10	116	30.2
11-15	128	33.3
16 or more	29	7.5
Cost of the ANC Services ($)		
<20	101	35.9
20-30	67	23.8
40-50	21	7.5
>50	4	1.4
Cultural Acceptance		
Yes	372	96.8
No	12	3.1

Table 1 shows the characteristics of respondents where it was found that majority of pregnant women in the Fonis are between the ages of 25-29 years (30.2%), approximately 75% are married, almost half of them either have no formal education or got primary education. Majority (more than 30%) have three children and a vast number of them (73.9%) are housewives. Furthermore, the study found out that a significant number of them (38.3%) have a monthly income between 50-100$ and live close to the antenatal care site. Modern antenatal care services are culturally accepted in almost all the regions (more than 95%) and costs less fortune or sometimes free for antenatal women with a Gambian national identity. The study showed that 54% of the respondents attended one ANC visit in Foni Bintang Karanai district. This is higher compared to Foni Berefet district where early ANC attendance was 13% (MoH, 2022). In The Gambia, the rate of early ANC visits by women of reproductive age was excessively low when compared to neighboring nations. This can be related to The Gambia's women's poor educational levels, incidences of insecurity, and cultural concerns. Sierra Leone had a 62% rate ofe antenatal care attendance, Nigeria had a 58% rate, and The Gambia had a 24% rate (GDHS, 2019/20; NPC, 2018; SLDHS, 2019). Although 96.8% of respondents said that ANC services are culturally acceptable, Foni had a relatively low rate of early ANC attendance. The majority of the women (62,5%) were also aware of the ANC services. This contrasts with a

study conducted in Nigeria that found that women's use of maternal health care, specifically ANC services, may have been positively influenced by their level of awareness about ANC services [26]. Furthermore, 30.2% of respondents fall between the ages of 25 and 29 reported having attended ANC. According to [25], mothers aged 20 to 34 are marginally more likely to receive prenatal care than mothers of other ages. There was no significant correlation between respondent age and early ANC attendance in rural Gambia (p>0,005). Contrary to popular belief, age is statistically significant for early ANC attendance, according to a Nepalese study [11], [17]. Early ANC attendance was found to be significantly influenced by the respondents' marital status, educational background, and parity. According to the findings, 223 married respondents (78.0%) went to ANC during their first trimester. Marriage status and early ANC attendance were significantly associated (p<0.005). This study is comparable to a Rwandan study that found that married women were more likely to attend early ANC appointments than widowed or separated women [9], [27]. The difference may be that married women have husband assistance whereas widowed women do not, especially if the husband is well-educated and financially secure, as this increases the likelihood that he will take his wife to a medical institution [28], [29]. 95 (53.1%) of the respondents in the study who had no formal education did not attend ANC, according to the findings. Early ANC attendance and educational level were associated (p<0.005). Education is related to getting the recommended number of ANC visits, according to (GDHS, 2019/20) Compared to 69 percent of women with a secondary or higher education, 43 percent of women with no education attended four or more ANC visits. According to a study by [30], [31], women with greater levels of education were more likely to attend at least four ANC visits than women with no formal education in HIV positive pregnant women. This can be explained by the notion that educated women are more likely to be aware of ANC services' availability and benefits. Additionally, educated women are more knowledgeable about health issues, are more aware of the services that are available for healthcare, and are better able to make use of the information than uneducated women. Women are more likely to seek out health care when their education levels rise. This was comparable to a study conducted in Pakistan, which discovered that more education tends to positively influence health-seeking behaviors and may provide women more control over their pregnancies [32]–[34]. The study showed that 55 (14.3%) of the respondents who had six or more children had not attended ANC. There was a significant statistical association between number of children and early ANC attendance (p<0.005). The findings are consistent with a rural Ghanaian study that found that women with one kid were more likely to attend ANC than women with two to four children [35], [36]. The reason could be that younger women, who may have had previous pregnancies without issues, may not perceive the need to visit an antenatal clinic, whereas older women, who may be experiencing their first pregnancy, may feel that they do. In this region, grand multiparity is widespread; 42.9% of respondents have four or more off springs [37]. Number of children gives women experience where they tend to understand and know exactly what to expect during antenatal care visits. These visits will give them a lot of protection against most of the antenatal complications such as anemia. Other studies (Birhan & Seretew, 2020; Duodu et al., 2022; Ibworo et al., 2020) (Birhan & Seretew, 2020; Duodu et al., 2022; Ibworo et al., 2020) revealed that the more children women have, the more they become aware and willing to attend antenatal care services at their own convenient time. At least 4 visits are recommended by WHO but some pregnant women have issues with that [8].

Figure 1: Percentage of antenatal care attendance among pregnant women attending antenatal care services in rural Gambia

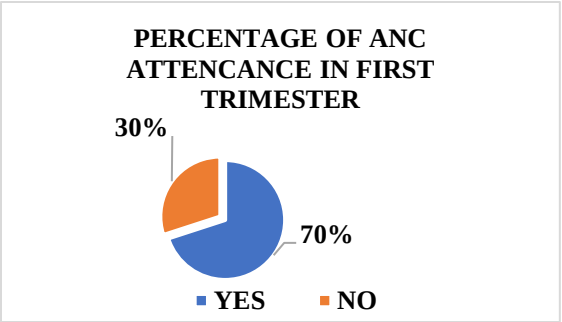

Figure 1 above shows that 54% of pregnant women attend antenatal care services during their first trimester. This is a clear indication that family support and encouragement in important in decision making as the pregnant woman will need someone to be encouraging her to take most of the decisions especially those that have to do with health.

3.1.1 Economic factors: Respondent's occupation, husband's occupation, and the level of income of the respondents was found to be significant for early ANC attendance. The results revealed that 128 (72.0%) of the respondents who were housewives did not attended ANC. There was a significant statistical association between respondents' occupation and early ANC attendance (p<0.005). The result is agreement with study done in Ghana which reported that occupation of the mother is statistically significant for early ANC attendance, [35], [39].

Table 2: Multivariate analysis of the variables related to early antenatal care attendance among pregnant women in rural Gambia.

Variable	OR	95% CI		P Value	B
		Min	Max		
Number of Children	0.82	0.72	1.29	0.004	0.998
Respondent's occupation	2.03	1.91	2.15	0.001	0.203
Household monthly Income	2.04	1.75	2.25	0.062	0.709
Distance to the nearest health facility (km)	0.75	0.50	1.10	0.072	0.556
Cultural acceptance	2.82	2.60	3.11	0.001	1.038
Marital Status	2.30	1.85	2.59	0.001	0.713
Highest Educational Level Attained	1.03	0.86	1.25	0.003	0.873

used multivariate logistic regression

Table 2 above shows a multivariate logistic regression analysis, number of children, respondent's occupation, culture, marital status, and level of education have a significant statistical relationship with early antenatal care visit in rural Gambia. Experience allows pregnant women to evolve and grow. When they're presented with a new environment, they tend to learn and adapt to the situation to succeed. They may also tend to develop new ideas and strategies because of their past experiences during their previous pregnancies. From the analysis, is can be stated that the more children a parent have, the more likelihood for her to attend antenatal care services in the first trimester (1.06) times more likely (OR [95% CI]: 1.06 [0.72-1.29]). The less busy a pregnant woman is at work (not working in an office), the more likely for her to visit antenatal care services earlier (2.03 times more likely). People's culture and tradition plays an important role in their health seeking behaviors. If a pregnant woman feels like her family or culture accepts her to do antenatal care services, it is 2.82 times more likely for them to attend antenatal care services earlier (OR [95% CI]: 2.82 [2.60-3.11]). Education level is important as mothers tend to know much and are well informed about the importance of early antenatal care attendance. Highly educated pregnant women are 1.03 times more likely to attend antenatal care services during their first trimester than those with no formal education systems. (OR [95% CI]: 1.03 [0.86-1.25]). Pregnant women in rural Gambia are more likely willing to attend antenatal care services during the first trimester when they are not far from the antenatal care service centers regardless of their household income.Sixty-six (62.3%) of the responders who had husbands who worked irregular hours skipped ANC according to the study. The husband's profession and the wife's early ANC attendance were related in other studies but and also in rural Gambia (p<0.005). This is consistent with a study conducted in Ethiopia that found the father's profession to be statistically relevant for early ANC attendance [40]. According to the study, 61 (35.5%) of the respondents with family incomes under $ 50 did not participate in ANC. The husband's profession and the wife's early ANC attendance were related (p>0.005). This may be explained by the fact that some respondents may find it difficult to afford the direct and indirect fees associated with accessing ANC services. The study's findings are in line with a study by [27], [41], which found that women in high-income households were three times more likely to receive ANC services than women in low-income households. The chance of households attending ANC services is predicated on their level of income, which is assumed to rise.

3.1.2 Accessibility to the health services: The study further revealed that almost three quarter of the pregnant women in rural Gambia are attending antenatal care services during their first trimester and more than 96% of the people are accepting and supporting the pregnant women to do so because it is culturally accepted in the area. The study shows that although the distance to the health facility or nearest antenatal care service center has no significant statistical relationship, but cultural acceptability, was found to be significant for early antenatal care attendance in rural Gambia. The results confirmed that 77 (43.0%) of the respondents whose distance to the nearest health facility was between 11-15km still attend ANC services. There was no significant statistical association between distances to the nearest health facility and early ANC attendance (p> 0.005). In contrast, distance has always been noted as a significant impediment to the usage of services, particularly in rural areas [13], [15], [42]. According to studies, the distance to services has an impact on how often people use general health services. But unfortunately, in rural Gambia that was not the case as pregnant women choose ANC service areas according to their liking. According to the study, 96% of those who said that ANC services should be tolerant of culture had used ANC. Early ANC attendance and cultural acceptance had a significant statistical relationship (p<0.005). This is in line with a study conducted in Malawi by [41] which found that culture was a determining factor of ANC utilization and women who were comfortable attending the services compared to their counterparts were more likely to do so [39], [43]. Culture can have an impact on early ANC attendance since, in some African cultures, it is the social norm to announce pregnancy only when it is visible, especially in women in the prime of pregnancy. This can result in a late start to ANC [32], [41]. The study also found that 39.5% of those who said ANC services were free did not really use them. However, there was no correlation between the price of ANC services and early ANC attendance (p>0.005). The result contradicts a study conducted in East Africa and Central Africa that found that early ANC attendance was severely obstructed by the high cost of ANC treatment [17], [44], [45]. 3.1.3 Level of awareness and Early ANC attendance: The survey found that the majority of the 165 respondents (80.5%) who were aware of the existence of ANC programs in the district participated in ANC. There was a relationship (p>0.005) between awareness level and early ANC attendance. This is consistent with a study conducted in Nigeria, which found that pregnant women who were highly informed about ANC services used those services more frequently overall, especially ANC [25], [26], [32].

3.1.4 Multivariate analysis of the variables related to early antenatal attendance among pregnant women attending antenatal care services in rural Gambia. The multivariate analysis shows that knowledge about ANC, level of education, number of children, mother's occupation, marital status and cultural acceptance (p value <0.005) have a significant statistical relationship with early antenatal care attendance of pregnant women in rural Gambia, while distance to the nearest health facility and household monthly income has no significant statistical relationship (p value > 0.005) with early antenatal care attendance of pregnant women in rural Gambia. 4. Conclusion: According to the study's findings, the majority of sociodemographic variables affected early ANC attendance. In the study, there was a statistically significant correlation between early ANC attendance and marital status, education level, and parity. According to the study's findings, respondents' early ANC attendance was significantly influenced by many economic circumstances. The findings of the study demonstrated the significance of health facility accessibility for encouraging early ANC attendance. Early ANC attendance was not significantly influenced by the distance to the medical institution but was significantly influenced by cultural acceptance. According to the study's findings, the district's early ANC attendance was low by WHO guidelines, which accounts for the district's high rates of mother and infant mortality. The study finds that there was widespread knowledge about ANC services, but regrettably this did not help to boost the percentage of early ANC attendance.

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Pattern of Congenital Anomalies as Seen in University of Benin Teaching Hospital, Benin City, Nigeria

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Abstract: **Background**: Congenital malformations are a major cause of perinatal and neonatal deaths, and disability both in developed and developing countries. Objective: The objective of this study was to

determine the pattern of congenital anomalies seen in babies admitted into the special care baby unit of University of Benin Teaching Hospital, Benin City, Edo state, Nigeria. Method: A prospective register of all congenital anomalies seen in newborns were kept within the study period of 2years. The details of each child's anomaly were documented and characterized. All the babies with congenital anomalies admitted from t" January 2008 to 31st December 2009 were included in this study.

Results: A total of 153 babies were admitted during the study period, 85 (5.6%) had congenital anomalies. More male babies had congenital anomalies, though the finding was not statistically significant. Booking status of the mother was significantly associated with having a child with congenital anomalies. More term babies had congenital anomalies than preterm babies. One quarter of the babies with congenital anomalies, died within the neonatal period. Gastrointestinal system malformations (36.5%) were the most common. CNS anomalies was second (29.4%) with myelomeningocele being the most common anomaly (18.8%), followed by musculoskeletal system anomalies (14.2%), genitourinary system (10.6%), chromosomal (5.9%), cardiovascular (3.5%).

Conclusion: The pattern of congenital anomalies in our region is different from that of developed countries. The booking status of the mother is significantly associated with having a child with congenital anomaly. Proper antenatal care could help detect this problem for early intervention.

Keywords: Congenital Anomalies, Newborns, Benin City, Nigeria.

Introduction - Congenital anomalies, birth defects and congenital malformations are synonymous terms used to describe structural, behavioral, functional, and metabolic disorders present at birth. The birth defect could be minor and allow the individual to live a near normal life or could be major and life threatening, that it prevents growth and development or may even result in death. Major anomalies are more likely in premature babies than in full term newborns."

Correspondence: Prof. A. I. Omoigberale Department of child health, University of Benin Teaching Hospital, PM B 1111, Benin City, Edo state. Congenital malformations are a major cause of perinatal and neonatal deaths 1•4 and disability both in developed and developing countries." The rapid decline in infant morbidity and mortality, in the developed countries has, focused the attention of pediatricians on the problem of congenital malformations; however, this might not be the case in sub-Saharan Africa where the burden of infection still holds sway. The global prevalence of major congenital anomalies ranges between 3_7%.7 However, when minor inconsequential anomalies are included, the incidence can be as high as 10-15%.6 Worldwide surveys have shown that the birth prevalence of congenital anomalies vary greatly from country to country. It was reported to be as low as 1.07% in 18

Comparison of Bioactive Molecules Produced in Vivo and In Vitro inan Aromatic Medicinal Plant: Vitex Negundo and its Use as Phytomedicine

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Abstract: Many traditionally used medicinal plants hold importance in modern-day's medical regimes as they have been scientifically proven to possess therapeutic properties. One such plant is Vitex negundo (Family: Verbenaceae) which has about 270 species distributed around the world. The plant parts possess diverse pharmacological activities including antimicrobial, analgesic, anti-inflammatory, anti-fertility, antioxidant, antihyperglycemic, and hepato-protective effects. Phytochemical studies of Vitex negundo have shown the presence of several types of compounds, such as volatile oils, lignans, flavonoids, terpenes (triterpenes, diterpenes, sesquiterpenes), and steroids. The most common flavonoid glycosides from an ethanolic extract of the leaves of Vitex negundo are 5-hydroxy-3, 6, 7-trimethoxy-2-(3, 4- dimtoxypheny)-

4H-chrome-4-on and 5, 7-dihydroxy-2-(3, 4-dihydroxy phenyl)-4H-chromen4-one, Nirgundosite. This plant also contains many polyphenolic compounds, glycosidic iridoids, and alkaloids and thus has a high antioxidant potential. In the present study, Vitex negundo callus was established using leaf explants from in vitro germinated seedlings and maintained on various artificial media to increase the secondary metabolite content. The leaf extracts and callus extracts were then screened for their phytochemical composition and compared to check the optimization of bioactive molecules in-vitro. The callus extracts were also checked for some novel component development. It was observed that there was 20% increase in Nirgundosite content in the callus cultures, while no novel compound was as far seen in the callus, though callus cultures are still being explored for the same. In-vitro cultures can thus be used for extracting Nirgundosite a potent drug that promotes healthy joints and improves blood circulation, which is also being formulated and popularly sold as herbal preventive medicine.

Assessment of Knowledge, Attitude and Perception of Covid-19 Vaccination among Final Year Students of the Faculty of Social Sciences of Nigerian Universities

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Abstract: Corona Virus Disease 2019 (COVID-19) is a pandemic that has posed a serious threat and challenge to our public health. It has so much impact on all aspects of life. The symptoms are enormous but not limited to fever, cough, tiredness, loss of smell, etc. effective vaccination has been found to be the most effective intervention in reducing the risk of getting seriously ill and dying upon exposure to the virus while reducing the risk of contracting and spreading the virus to offering protection against COVID-19 variants. The major aim of this study is to assess the knowledge, attitude, and perception of COVID-19 vaccination among final year students of the Faculty of Social Sciences, Enugu State University of Science and Technology, Enugu, Nigeria. A cross-sectional study was conducted using a well-structured questionnaire, distributed among the students. The questionnaire was retrieved and entered into an excel spreadsheet and analyzed using simple percentages. A total of 408 participants between the age bracket of 18 and 23 were assessed with 79.4 of the respondents not vaccinated. 63.7% of the participants recorded below- average knowledge of COVID-19 vaccination while 60% of the participants possessed below average attitude towards COVID-19 vaccination, and 61.7% of the respondents have a below-average perception of COVID-19 vaccination. In conclusion knowledge, attitude, and perception of COVID-19 vaccination among the students were found to be below average.
Keywords: Knowledge, Attitude, Perception, COVID- 19 Vaccine, Vaccination

Implementing New Health Care Technology Approaches: Benefitsand Challenges

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Abstract: Medical technology is applied to improve the delivery of safe patient care by providing tools for early diagnosis, monitoring, and ongoing treatment of patients. This technology consists of bedside telemetry, bedside physiological monitors, electrocardiogram devices, pulse oximeters, infusion pumps, online ventilators, and e-health records. Healthcare costs are a challenge for society, and hospitals are under pressure to cut costs by releasing patients earlier. Healthcare technology is utilized to facilitate these early discharges. Lack of knowledge and limited understanding about how healthcare facilities buy, deploy and adopt the technology. The pandemic has certainly accelerated technological advancements and their adoption in the healthcare sector. It is now easier and faster to get medical treatment outside the traditional four walls of a medical facility, which improves convenience and accessibility for everyone. This study explores the benefits of smart healthcare and how technology is changing the healthcare sector as well as the emerging and future challenges of technological advancement such as data sharing, medical life transparency, predictive analytics, and the power of technology and mobility control. Two areas of theory and approaches are presently in use when studying technology: technology application and implementation. Technology adoption primarily focuses on how end-users adopt technology, while implementation reports the methods, interventions, and variables that drive the use of the evidence-based practice. The study reports two approaches are not well-informed about each other and the limited concept of health technology implementation frameworks emerges the knowledge gap. The study confirms a holistic approach is required to fill this gap. This research might be helpful to understand the new technology implementation drivers applied by major healthcare institutions via the study review of present theories and recent approaches to technology adoption and implementation.
Keywords: New Health Care Technology, Approaches, Benefits, Challenges, Future Trends

Can Social Media Influencers Encourage Healthier Behaviour? AStudy of Food Influencers and Home Cooking Intentions

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Abstract: Context - Previous literature acknowledges the importance of exercise and diet for health. In recent decades, the consumption of takeaway and premade processed foods has become more frequent, as has eaten away from home. The Interprofessional Association of Fresh Fruits and Vegetables (Interfel) reports a reduction in fruit and vegetable consumption in 2021 among the French population, in favor of ready-made meals. However, a body of research points to the negative effects of such eating habits on health. In contrast, home cooking has been shown to be beneficial to health. As such, it seems important to better understand the factors that encourage home cooking. Social media influencers are found to be very effective in promoting and influencing the purchase intentions of their audience. Influencers typically position themselves as experts in particular topics of interest, such as technology, fashion, fitness, beauty, food, and health. As such, aside from products, influencers may also promote particular lifestyles and behaviors, including healthy eating. However, it is unclear whether digital celebrities have the power to

influence the behaviors of their followers beyond their purchase intentions. Research Objectives - In this article, we aim to investigate whether social media influencers could help to improve public health by being role models for their followers and encouraging home cooking. Based on social cognitive theory, we build an original research model to investigate factors that would encourage social media users to reproduce the recipes provided by food influencers on their channels. Methodology - We collect data using an online survey administered within a large population of users of social network platforms in France. To operationalize our constructs, all measures used in this study are adapted from the literature. A partial least squares (PLS) approach with SmartPLS software is used to assess our model and our hypothesis. Findings - Our results show that novelty-seeking and, to a greater extent, the vicarious experience of cooking with an influencer can motivate home cooking. However, we find no effect deriving from perceived benefits relating to finances, health, entertainment or socialization. Although self-efficacy is influenced by the cooking experience, one's similarities with an influencer, verbal persuasions or the perceived ease of recipes, self- efficacy itself does not seem to play any role in the intention to imitate an influencer. **Research Outcomes** - According to social cognitive theory, the behaviors that are observed and recalled would be imitated if the person is somehow motivated to imitate. A behavior that is perceived as beneficial and attainable is more likely to generate the motivation to reproduce it. According to our results, on the other hand, the effect of perceived benefits and perceived self-efficacy do not seem to motivate social media users. Rather, it is emotional, vicarious experience and novelty-seeking that drives behavior reproduction. Thus, from a theoretical point of view, social cognitive theory does not seem to apply well to social media influencers, probably due to the nature of the context, which is entertaining rather than educational. From a practical point of view, influencers could indeed play a role in influencing healthier behaviours, providing motivation via the emotional transfer of experiences via processes similar to those applied in the advertising industry. We would also expect our results to apply to more traditional media, such as cooking TV shows and maga- zines, which could influence home-cooking by eliciting vicarious experiences. Future Scope - Our results highlight the importance of vicarious experiences in attempts to encourage a particular be- behavior. Thus, future research could go further by investigating the causes of such experiences.Also, future research could further explore the power of social media and its influencers in encouraging positive behaviours that are beneficial to public health.

Keywords: Social Cognitive Theory, Social Media, Influencers, Home Cooking, Public Health

A Portable Miniature Syringe Needle Remover and Receptacle for Drug Injection Users

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Abstract: In today's drug-ridden society, drug injection is gradually becoming more popular and has hidden danger to IDUs (injection drug users) such as infectious diseases. According to reports, 67% of IDUs reported improper disposal at some point over the prior 30 days, leading to a proliferation of injection needles on streets. In recent years, the number of cases of children or ordinary people unintentionally picking up needles have increased. Various needle remover inventions have begun to surface, but the existing ones are either expensive, unportable, or risky for IDUs. In order to effectively alleviate the proliferation of drug injection needles and improve the invention of needle removers, a miniature portable needle remover and receptacle is invented. The device for capturing and storing syringe needles contains an upper lid portion mounted tightly onto the lower box portion through an interlock system on the opposing sides of the device with a breaking-twisting mechanism to remove the needle. The invention is intended to be affordable to the general public, safe enough for IDUs to use, reliable enough not to harm the others, and effective in breaking needles from the syringe. This report is conducted in the hope to spread awareness of the dangers of drug injection and to provide a way to mitigate this drug rampant situation.

Keywords: Needle Remover, Drug Injection, Injection Drug Users, Portable, Receptacle

Challenging And Issues of Public Health Systems in Developing Countries; A Quantitative Study

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Abstract: This paper investigates the issues and challenges of public health systems in developing countries. This study claims the following possible challenges of failing the public health systems such as the poor health information systems, social inequality and discrimination, lack of financial and human resources. This paper has also claimed the lack of public awareness about the healthy life styles, polluted environment and healthy diet in their daily activities. This paper will use the quantitative research approach to present and analyze the data in this study. The SPSS software will use to quantify the data and present the finding of the study. The questionnaire will be used to collect data for this study. The main finding of this study will be to investigate the issues and challenges of developing-country public health systems. The main challenges in developing countries will be poor lifestyles, pollution, illiteracy, a lack of infrastructure, attitudes toward medical professionals, traditional treatment, cultural systems, and government policy. The data for this paper will be analyzed using the SPSS software, which is based on quantitative research.
Keywords; Public Health, Awareness, Healthy Diet, Health Systems

Relationship Between Technology Usage, Curiosity, Self-efficacy and Misbehaviour among Preschoolers from the Perspective of Teachers

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Abstract: Misbehavior is a significant problem among preschoolers. It is a common and frequently reported by the preschool teachers. It has been highlighted because past studies found that preschoolers who misbehave are at high risk of Emotional Behavioural Disorder and often facing difficulties in study. Recently, there has been growing attention on the impact of preschoolers' misbehaviour at the school, government, as well as the society level. This study aims to examine the relationship between technology usage, curiosity and misbehaviour among preschoolers from the perspective of teachers. Additionally, this study also examined the role of self-efficacy as mediator between technology usage and curiosity relationships with preschoolers' misbehaviour. A total of 400 preschoolers (4 - 5 years old) in Selangor, Malaysia involved in the study. Multistage cluster sampling was used to recruit the sample. The instruments used to assess the variables were: 1) Behaviour Rating Index for Children, 2) Curiosity and

Exploration Inventory (II), 3) Self-Efficacy Questionnaire for Children (SEQ-C) and 4) Technology Usage. The data was analysed by using SPSS Pearson correlation, multiple regression, and PROCESS macro. Findings from this study illustrated that there were significant and positive relationships between technology usage, curiosity, self-efficacy and misbehaviour among preschoolers. Self-efficacy was found to be the strongest predictor of misbehaviour. The results of mediation analysis suggest that self-efficacy mediated the relationships between technology, curiosity and misbehaviour. This present study increases the understanding on the technology usage, curiosity and self-efficacy as the factors of misbehaviour among preschoolers. The findings of this study can be useful for teachers, parents, counsellors, future researchers and policy makers.
Keywords: Technology Usage, Curiosity, Self-efficacy, Misbehaviour, Preschoolers

Social Media Usage and Mental Health During The COVID-19 Pandemic: Mediator Role of Negative Affect Among Working Adults In Malaysia

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Abstract: The current COVID-19 pandemic has led to various impact of our life including the mental health. Base on research conducted early in 2020, they found that a higher percentage of Malaysian reported with depressive, anxiety and stress symptoms in the fourth time period from August till September (Wong et al., 2020). This study aims to look at the correlation between the social media usage and mental health while identifying whether negative affect play mediator role for it among working adults in Malaysia. The sample of 385 working adults in Malaysia were recruited via purposive sampling method. The research's variables were evaluated by using total hour of the social media usage, Depression Anxiety and Stress Scale (DASS-42) and Negative Affect Negative Affect (NA) scale of the Positive and Negative Affect Schedule (PANAS) via online Google Form. The present study's results were analysed with Pearson correlation, multiple regression and mediation analysis through SPSS program. Based on this study, the result shows that there is a significant relationship between social media usage and level of mental health. Furthermore, the results demonstrated that negative affect is partially mediates the relationship between social media usage and level of mental health of the working adults.

The Perception of Family and Emotional Experiences of Orphan Adolescents in Malaysia

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Abstract: Children's development, particularly in the area of their emotions, has been adversely affected as a result of their lack of early exposure to the experiences of family life. Teenagers who have lost both of their parents must not only learn to live with the anguish and sorrow that accompany this loss, but also find a way to adjust to the additional demands placed on them as a result of this tragedy. Previous research minimally focuses on the family concept and emotional condition. This led the current study to explore the perception of family and emotional experiences of orphan adolescents in Malaysia and if social support has an influence on their life. To achieve the objective of this study, qualitative research using phenomenological approach was conducted on 8 participants who were recruited through purposive sampling from orphanages in Klang Valley, Malaysia. The participants were selected based on the inclusion criteria, (i) age of 13 to 17 and (ii) who lives in orphanages for a minimum of three years. The data was collected using semi-structured interview through open-ended questions. The collected data was analysed using qualitative tool, Atlas.ti. The themes are referring to caretakers and friends as family, definitions and significance of family, positive emotional experiences, struggles faced growing up in orphanages, social support received and expectations of future social support. The study reported that the participants experiences both positive and negative emotional experiences of staying in orphanages due to many reasons. Therefore, as for social support, participants deemed tangible needs as the most useful and hoped for more informational, tangible and social network support in the future. From the results, it can be concluded that the caretakers or friends could be referred to as a family for orphan adolescents which influences their emotional experiences. Future researchers may utilize other methodologies to discuss the topic in broader terms and support with stronger evidence.

Sensitive and Low-Bias Transcriptome Sequencing Using Agarose PCR

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Abstract: Transcriptome sequencing has emerged as an important research tool for exploring the mysteries of life at the single cell level. However, its wide application is limited by the bias associated with the amplification reactions which is essential for library building of trace RNA. In this study, low-melting-point agarose was added to the amplification reactions to take advantage of its molecular crowding effect and polymer cross-linked structure to improve the sensitivity of the reactions and reduce bias. To further evaluate the performance of the method, it was applied to transcriptome sequencing of microregion samples from brain tissue sections of mice with Parkinson’s disease at the single cell level. The results showed that agarose PCR had better performance than in-tube PCR. Further application of agarose PCR to transcriptome library sequencing could obtain data closer to that of unamplified. With the addition of low melting point agarose, the sensitivity of the amplification reaction was significantly increased, while homogeneity was increased by approximately 2-fold. Not only that, but this work also provides 11% sensitivity improvement for spatial transcriptomic study on Parkinson’s disease-associated gene detection. The agarose PCR provides a new tool for efficient and homogeneous amplification of trace samples and can be widely used for spatial transcriptome library sequencing and studies.

Fear of Negative Evaluation and Social Interaction Anxiety Among Persons with Disability and Typically Developing Persons

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Abstract: **AIM** to study the influence of fear of negative evaluation on social interaction anxiety among persons with disabilities. To study the influence of fear of negative evaluation on social interaction anxiety on persons without disability.
Hypothesis: Fear of negative evaluation has significant influence on social interaction anxiety among persons with disabilities. Fear of negative evaluation has significant influence on social interaction anxiety among persons without disabilities Fear of negative evaluation has significant influence on persons with disabilities.
Method: The participants of the present study consist of 118 individuals (56 individuals without disability and 63 individuals with disability) data was collected using Google form and printed questionnaires. The instruments used in the current study are social interaction anxiety scale developed by Mattick and Clarke (1989) and brief fear of negative evaluation developed by Leary (1983).1) There is a significant positive relationship between fear of negative evaluation and social interaction anxiety among typically developing Persons 2) persons with disabilities. 3)difference in social interaction among persons with disabilities and typically developing persons. 4)there is a significant difference in fear of negative evaluation among persons with disabilities and typically developing persons.
Results: There is a positive correlation between social interaction anxiety and fear of negative evaluation among persons with disabilities and typically developing persons. Females are more socially anxious than males. There is no gender difference in fear of negative evaluation gender moderates the relationship between social interaction anxiety and fear of negative evaluation. The world health organization (2011) defines disability as an umbrella term for impairments, activity limitations, and participation restrictions, referring to negative aspects of the interaction between a person with impairment and attitudinal and environmental barriers. India is an authorized signatory in the convention of rights of persons with disabilities in the year2006as the result of which the rights of persons with disabilities act (2016) passed in the country according to which a person with a disability is defined as a person with long term physical, mental, intellectual or sensory impairment which in interaction with barriers hinders their full participation in the society equally with others. The recent act in India is rights of persons with disabilities act in india (2016) in this act he types of disabilities have been increased from 7 to 21. The act added mental illness, autism, spectrum disorder, cerebral palsy, muscular dystrophy, chronic neurological conditions, speech and language disability, thalassemia, hemophilia, sickle cell disease, multiple disabilities including deaf blindness, acid attack victims and Parkinson's disease which were largely ignored in earlier act. Social interaction is defined as " the development of cooperation and competition, the impact of status and social roles, and the changes of group behavior, leadership, and conformity."(APA Dictionary 2020 p996) social anxiety and fear of negative evaluation (FNE) are risk factors for numerous maladaptive outcomes, including depression (Stein, Tancer, Gelernter, Vittone, & Uhde, 1990), restricted development of interpersonal relationships (Schneier, Johnson, Hornig, Leibowitz, & Weissman, 1992), poor academic functioning (Turner, Beidel, Dancu, & Keys, 1986), and heightened risk for substance abuse (Page & Andrews, 1996). Given the serious consequences that can follow from social anxiety symptoms, it is essential to determine which individuals are most vulnerable. Although broad vulnerability factors have been known for some time, such as a withdrawn, behaviorally inhibited temperament (e.g., Biederman et al., 1993), little is known about how to predict which particular individuals will go on to develop social anxiety later in life, suggesting the importance of intervening life experiences in the manifestation of

anxiety (Turner, Beidel, & Wolff, 1996). Specifically, “prospective studies of children characterized as shy or behaviorally inhibited suggest that a proportion of them will develop anxiety during adolescence. However, to date, it is unclear how to determine which children are likely to develop more severe disorders.” (Beidel, Morris, & Turner, 2004, p. 147). The various phases of developing children, their stages of growth at times, and their regression or failures have been the most appealing frames of reference, in the developmental approach. this approach to the study of childhood, emphasizes the biological, of physical and physiological processes. The shortcoming of this approach is that children are expected to perform in a step-by-step manner as they reach particular age if they fail to meet the developmental milestones of Particular age, this may create anxiety in parents (Banarjee, 1987). This is especially true in the case of individuals with disability. The onset of adolescence – is typically between12–and 18(Erikson, 1985). During adolescence, individuals experience hormonal changes that create impulse control issues, anxiety and rebelliousness, and distance from parents (Freud, A.1958; S.Freud, 1921/1949) When a child goes through a transition from childhood to adolescence they pass through a crisis which is known as identity versus role confusion. It is a critical period for the development of identity that includes career and works an individual wants to practice,(vocational identity), political identity, spiritual or religious identity, relationship identity, intellectual identity personality characteristics like whether the person is introvert or extrovert and body image.(Eickson, 1950/1968).Adolescents with disabilities often experience lack of friends of their own age group -outside their families, this may impact self -image development(Adamson, 2003). Issues faced by youth with disability have often been defined in terms of medical concerns, it is now clearly recognized that disability is a cross-cutting issue and that it is often not medical but rather social, economic and human rights issues that are key barriers in the lives of these young people. For this reason, the UN Convention on the Rights of Persons with Disabilities (CRPD; UN, 2008) identifies persons with disabilities as individuals who have long-term physical, mental, intellectual or sensory impairments which, when combined with negative attitudes or environmental barriers, prevents them from taking a full and active role in society. A study was conducted by Miklos, Johansen Nyquist Hanisch, Girdler s. (2022) on the social interaction and personal engagement of persons with disabilities in a rehabilitation center context. It was an ethnographic study consisting of 16 young adults recruited using purposive and theoretical sampling. Structured interviews, participant observation, and informal interactions were used to attain triangulation. The results revealed that the experience at the rehabilitation centers helped the individuals with a disability to helps them to create more friends be part of a community seeing on the self through others, activity sharing experiences of living with disability lead to two types of experience 1) equality and cohesion and stigmatization due to comparison. with peers, self-exploration regarding social interaction four themes emerged setting goals and achieving desired outcomes. Trying and participating in different activities, improving skills in different areas, mastery experience improving physical functioning like training to exercise and managing energy. The participants anticipated various benefits of being with peers like understanding, peer learning, and being young.4) autonomy and motivation i.e., being energetic in social interaction self-understanding and what one can learn about oneself and a follow-up study was conducted where the participant's transportation, economics, and being oneself. According to Erickson (1968) middle adulthood extends from the age of 40 to 65, the main crisis faced by this age group is generativity versus stagnation. Generativity means that adults desire to leave legacies of them through the next generation (Peterson, 2002) stagnation is a state experienced by the individuals when they feel they had done nothing for the next generation. Generativity can be achieved in a number of ways like biological generativity refers to having children, parental generativity refers to nurturing and guiding children, work generativity refers to skills passed down to others. Cultural generativity refers to conserving some aspects of one’s culture (Kotre 1984) individuals with disability face many obstacles in employment, education marriage and raising children so persons with disability experience more developmental crisis than typically developing individuals. Older and ns middle adullts face various issues like limitations in performing activities of daily living (ADL) They face low social contact because of factors like death of spouse and children going abroad for studies and job (Atchley 1980; George 1989). This is high among persons with disabilities and women (Simonick kasper &Philips 1998). Social interaction is defined as “ the development of cooperation and competition, the

impact of status and social roles, and the changes of group behavior, leadership, and conformity."(APA Dictionary 2020 p996) social anxiety and fear of negative evaluation (FNE) are risk factors for numerous maladaptive outcomes, including depression (Stein, Tancer, Gelernter, Vittone, & Uhde, 1990), restricted development of interpersonal relationships (Schneier, Johnson, Hornig, Leibowitz, & Weissman, 1992), poor academic functioning (Turner, Beidel, Dancu, & Keys, 1986), and heightened risk for substance abuse (Page & Andrews, 1996). Given the serious consequences that can follow from social anxiety symptoms, it is essential to determine which individuals are most vulnerable. Although broad vulnerability factors have been known for some time, such as a withdrawn, behaviorally inhibited temperament (e.g., Biederman et al., 1993), little is known about how to predict which particular individuals will go on to develop social anxiety later in life, suggesting the importance of intervening life experiences in the manifestation of anxiety (Turner, Beidel, & Wolff, 1996). Specifically, "prospective studies of children characterized as shy or behaviorally inhibited suggest that a proportion of them will develop anxiety during adolescence. However, to date, it is unclear how to determine which children are likely to develop more severe disorders." (Beidel, Morris, & Turner, 2004, p. 147). Fear of negative evaluation (FNE) was originally defined as a trait related to "apprehension about others' evaluations, distress over their negative evaluations, avoidance of evaluative situations and the expectation that others would evaluate oneself negatively" (Watson & Friend, 1969 p. 449). Social anxiety is partially a response to fear of negative evaluation (Kumar et.al 2015). The fear of being negatively evaluated (FNE) is regarded as a defining feature of social anxiety. According to cognitive theories, this anxiety may be the result of biased information processing, especially when one is anticipating a threatening situation (Clark and McManus, 2002). Individuals with social anxiety demonstrate an unfavorable assessment of social events, which is defined by the selective retrieval of negative information about the individual (Rapee and Heimberg,1997). This biased information is then utilized to make negative self-evaluations (Rapee & Heimberg.; Rapee and McManus,2002). spence and rapee 2004). In their influential approach, Rapee and Spence (2004) suggested that social anxiety might be seen as lying on a continuum: the lower end of the sequence indicates no social anxiety and o end of the sequence meets the criteria of social anxiety disorder. **Hypothesis**: 1) There Social interaction anxiety and fear of negative evaluation among typically developing individuals 2) There is a significant relationship The social interaction anxiety and fear of negative evaluation among persons with a disability 3) There is a significant gender difference in social interaction anxiety 4) There is a gender difference in fear of negative evaluation.

Method: **Participant Details**: Frequency participants by categorization of disability

Disability	No. participants
Mobility problems	27
Blind/seeing difficulty	8
Deaf/hearing difficulty	13
Mental illnesss	11
Multiple disability	2
Disability other than listed	1
Unseen disability like asthma epilesy	1

TOOLS USED: **Social interaction anxiety scale**: It consists of 20 items. Each item measured on a 4-point scale ranging from not at all true of me to extremely true of me the score ranges from 0 to80. The scale has good reliability its consistency ranging from the scale have good psychometric properties as attested by satisfactory reliability indices: determined by Cronbach's α, ranged from 0.88 to 0.93.

Fear of negative evaluation scale: It was developed by Leary in 1983. Each item is measured in 5 Point Likert scale scores ranging from 1 to 60.and the reliability of the scale is 0.9 and the scale also has good psychometric properties.

PROCEDURE: The study consisted of 118 participants. (56itypcally developing children and 63 persons with disability and 59 males and females Participants were located using Google and specifilly form. participants with disability were located from 2 disability rehabilitation centers. were located and consent was asked from them. Those who cannot fill the question alone the questionnaire was filled by the researcher after completion the participants were thanked for their co-operation.
ETHICAL CONSIDERATIONS: consent was asked for participation. confidentiality was maintained. And nonparticipant was harmed.

Antiurolithiatic Investigation of Aerva Lanata Metabolites in Synthetic Urine and Cell-Free in Vitro Assays

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Abstract: Urolithiasis commonly referred to as kidney stone disease, is a painful urologic condition that can cause fast deterioration of renal function. Though several anti-urolithiasis treatment options are available, there is still a need for economical treatment, and to avoid stone recurrence and maintain renal functions. In this study, we investigated the anti-urolithiasis potential of Aerva lanata extracts. We identified the potential phytochemicals in Aerva lanata with a majority of α-Tocopherol, γ-Sitosterol and campesterol being identified using gas chromatography-mass spectrometry (GCMS). In the in-vitro study using nucleation, aggregation and oxalate depletion assays, inhibition efficiency of the plant extract at different stages of stone development was tested, and the experiments were performed in triple runs. The results showed a maximum of an average crystal area reduction of up to 88.73% and a 52.36% stone formation inhibition at a concentration of 3mg/ml during a 30-minute incubation period. Hence, this pilot study on the Aerva lanata metabolites proved anti-urolithiatic efficiency.
Keywords: Antiurolithiatic Activity, Ayurveda, Calcium Oxalate, Gas Chromatography-Mass Spectrometry, Kidney Stones, Siddha Medicine

A Study of The Correlation and The Validity of Serum Nt Probnp Level in

Predicting Left Ventricular Systolic Dysfunction in an Adult Population in Sri Lanka

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Abstract: **Introduction**: Identifying the presence of Left Ventricular Systolic Dysfunction (LVSD) facilitates appropriate treatment at an early stage of the disease process and by so doing, reverses the severe complications such as Congestive Heart Failure (CHF). The increased blood N-Terminal pro Brain Natriuretic Peptide (NT- proBNP) level reflects ongoing cardiac dysfunction hence it provides a steadfast indication of LVSD. However, only a few studies could be located addressing the role of NT proBNP in identifying LVSD in South Asian region, therefore, the current study aimed to address the correlation and validity of serum NT proBNP level in predicting LVSD in an adult population in Sri Lanka.

Methodology: A total of 100 LVSD patients (left ventricular ejection fraction -LVEF <50%) as confirmed by echocardiography were recruited for the study carried out from November 2020 to October 2021 at a tertiary care hospital in Sri Lanka and the findings were compared with a control group of 100 non-LVSD individuals (LVEF >60%). First, with the informed consent, eligible participants were assessed for their demography and clinical information. A 4mL of venous blood sample to yield the serum was then obtained. The serum NT proBNP level was assessed by using Human NT-proBNP ELISA Kit (Catalog No: E-EL-H6126) imported from Wuhan Elabscience Biotechnology Company.

Results: The mean ages of the LVSD and non-LVSD groups were 69.1 ±6.2 years and 68.3±6.15 years,

respectively. The LVSD group demonstrated a mean serum NT proBNP level of 1073 ±1345.74pg/mL as compared 139.18 ±153.55pg/mL in non-LVSD group (p< 0.001). The highest mean NT proBNP level was in the severe LVSD (LVEF<30%) category (2522.40±1732.77pg/mL) followed by moderate (541.20±185.74pg/mL) and mild LVSD (LVEF 40%-50%) category (357.21±108.53mL). A strong negative correlation of serum NT proBNP level with LVEF (Spearman rho = -0.859, p<0.001) was observed whilst the area under ROC curve of serum NT proBNP level for differentiating LVSD was 0.942 (95% CI: 0.911 – 0.973). The optimal cut-off level of serum NT proBNP for predicting LVSD in the local study population was 209.86pg/mL (96% sensitivity, 80% specificity, PPV of 82.8% and NPV of 95.2%) along with an odds ratio of 96 (95% CI, 31.51-292.39) for predicting LVSD. Discussion and Conclusion: The LVEF exhibited a strong negative correlation with the NT proBNP level suggesting that when the LVSD become severe, the serum NT proBNP level gradually rises. The proposed cutoff level in the present Sri Lankan study falls among the range of different cutoff levels as presented in the overseas studies. Because of the higher NPV related to the proposed cutoff level, it can be used as a reference point to exclude LVSD in high-risk individuals effectively.
Keywords: Left Ventricular Systolic Dysfunction (LVSD), Left Ventricular Ejection Fraction (LVEF), Congestive Heart Failure (CHF), N-Terminal pro Brain Natriuretic Peptide (NT- proBNP), Adults, South Asia

Dielectrophoresis Spectroscopy for Nucleotide Identification in DNA

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Abstract: DNA sequence with a known physical position on a chromosome is called a genetic marker, so the causal gene may identify with genetic markers in different kinds of hereditary diseases. DNA segments near one another on a chromosome often inherit the other concurrently; as a result, the inheritance of a neighboring gene that has not yet been discovered but whose general position is tracked by using genetic markers. So, Genetic markers can play a significant role in biological research because they can contribute to identifying many diseases. Single nucleotide polymorphism, or SNP (pronounced "snip"), is the variation of a single nucleotide in a DNA due to genetic disorders. For example, in a specific region of DNA, an SNP may replace the nucleotide cytosine (C) with the nucleotide thymine (T). SNPs, or single nucleotide polymorphisms, are one of the most common genetic variations that assist in detecting many human diseases such as Migraine, Cancer, Schizophrenia, Sickle Cell Anemia, Alzheimer's Disease, etc. Hyperchromicity, Short Oligonucleotide Analysis Program (SOAP), quantitative PCR techniques, Fluorescence Polarization Melting Curve Analysis, SNP Microarrays, Intercalating Dyes, and many other techniques are commonly used to identify SNPs nowadays. However, those methods are not much reliable, a bit costly, time-consuming, and difficult to use, whereas dielectrophoresis can be an excellent way to detect SNP easily. A non-uniform electric field generated by electrodes interacts with polarizable suspended particles to regulate and alter particle movement; this process is known as dielectrophoresis (DEP). Cell transfer, in vitro fertilization, and biological testing are a few uses for dielectrophoresis, particularly in the biomedical industry. Cell fusion using dielectrophoresis has also improved

crossbreeding, cancer treatment, and scientific research. Most notably, dielectrophoresis is used to classify changes in the electrical characteristics of cells. In this phenomenon, when a dielectric particle is exposed to a non-uniform electric field, a force is produced on it, and this DEP force may be utilized to recognize the variations in a single location in a DNA sequence. DEP is less time-consuming, cheap, and reliable than other processes to detect the SNPs easily.
Keywords: Spectroscopy, Single Nucleotide Polymorphism, Dielectrophoresis, Oligonucleotide

Time For a Do-Not-Resuscitate Policy? Outcomes Of Inpatient Cardiopulmonary Resuscitation in Very Old Patients in Bahrain

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Abstract: **Background**: Globally, do-not-resuscitate orders have been used for many years. Due to the lack of a do-not-resuscitate policy, full resuscitative measures including cardiopulmonary resuscitation (CPR) are applied for all patients admitted to our institution regardless of prognosis.
Aims: To observe the outcomes of very old patients who underwent CPR, including mortality rate and length of stay. This will allow discussion of the need to implement a do-not-resuscitate policy in Bahrain, and its associated challenges.
Methods: This was a retrospective observational study conducted in a 1200-bed tertiary hospital in Bahrain. We included patients aged ≥ 80 years admitted under general medicine who underwent CPR between January and July 2018. Medical records were reviewed for patients' characteristics and outcomes.
Results: Ninety patients were included in the study with an average age of 87.91 (6.27) years. The in-hospital mortality rate was 96.67%, and 57.78% of patients died immediately after the first CPR attempt and 38.89% died during subsequent attempts. The survival rate at 1-year follow-up was only 1.11%.
Conclusion: Survival of very old patients after cardiopulmonary arrest is low, and survival at discharge is even lower. The increase in the very old population will lead to a higher demand for critical care resources given the absence of a do-not-resuscitate policy. Our results demonstrate that implementing such a policy at our institution is crucial to reduce the number of futile CPR attempts, minimizing patients' suffering, and optimizing resource allocation.
Keywords: Cardiopulmonary Resuscitation, Critical Care, Do Not Resuscitate, Geriatric Medicine, Inpatient Mortality
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Assessing the Copy Number Variations in Saudi Autistic Children

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Abstract: **Objective**: Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by difficulties in social communication and interaction along with repetitive behaviors. The prevalence of autism is increased dramatically each year while the etiology of autism is still not fully understood. The cytogenetically visible chromosomal abnormalities which refer to copy number variations (CNVs), have been contributing to the pathogenesis of ASD. More than 1% of ASD conditions can be analyzed via genetic locus whereas the ratio rises nearly 5-10% by CNVs. However, few studies in Saudi Arabia have been detected the CNVs linked to ASD. Therefore, the experimental investigation conducted in this study to explore the related CNVs in Saudi autistic children.
Patients And Methods: The genomic DNA was extracted from the peripheral blood of 14 Saudi autistic children along with four healthy control children then array-based comparative genomic hybridization (aCGH) was used to detect CNVs.
Results: Bioinformatics analysis of aCGH reported that recurrent and non-recurrent deletion/duplication CNVs were detected in many regions of the genome of autistic children. The most frequent CNVs are 1q21.2, 3p26.3, 4q13.2, 6p25.3, 6q24.2, 7p21.1, 7q34, 7q11.1, 8p23.2, 13q32.3, 14q11.1-q11.2, 15q11.1-q11.2, Xp22.33, Yp11.32, Yp11.2, Yq11.21.
Conclusions: In this study, the result identified CNVs in Saudi autistic to comprehend more about the etiology of autism, which may facilitate the diagnosis of autism in Saudi Arabia. Additionally, this study illustrated the importance of aCGH in autism diagnosis since it can be used to characterize a patient sample in terms of potential cytogenetic aberrations through the detection of CNVs.
Keywords: CNVs, Autism, aCGH, Genetic Variants, Chromosomal Abnormalities

A Qualitative Study of Effects of COVID-19 Outbreak on Older Adults with Mild Cognitive Impairment in Chile

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Abstract: The COVID-19 pandemic imposed a psychological burden on elderly and particularly individuals with cognitive impairment and dementia. The objective of this study was to explore the experiences and feelings of older adults with MCI during the COVID-19 outbreak in Chile and to know what strategies they used to overcome social isolation. Method: A qualitative design was used. Participants with a diagnosis of MCI took part in this study. All interviews were recorded and coded using thematic analysis. Results: The thematic analysis identified three themes related to the quarantine experience of older adults with MCI diagnosis: (1) Effects of social isolation during the COVID-19 pandemic (2) Believes, feelings and behaviors about the SARS-CoV-2 virus (3) Coping with social isolation/response to difficulties during the pandemic. It was found that older adults with MCI have been mainly psychologically and socially affected by social distancing and isolation, particularly individuals who were alone during COVID-19 outbreak. The only physical dimension negatively affected was the level of activity. Social isolation led to a significant number of negative emotions such as anger, fear of contracting the virus or possibility of contagion for their families, worries and sadness as well as emotional loneliness. It is noteworthy that the majority of participants have used several coping strategies during this challenging time. It is noteworthy that the majority of participants have used several coping strategies during this challenging time such as acceptance, positive reframing, religion, self-distraction, instrumental support, planning, and venting as well as staying connected. Conclusion: Since social isolation and a sedentary life have been associated with

poorer cognition and functionality in people with MCI, a rational plan to both prevent the progression of cognitive decline and to increase social contact, is essential. Special attention must be drawn to maintaining people physically active at home and keeping their daily routine (within the possibilities) and also to ensure social connectedness through technology. Implementation of these measures could potentially reduce negative emotions during the pandemic.

Keywords: Mild Cognitive Impairment, Elderly, Mental Health, COVID-29

Outcomes of Substance Use Disorder Treatment Service Users During COVID-19 Pandemic: 1 Year Longitudinal Study

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AIM: COVID-19 pandemic led to significant disruption of substance use disorder (SUD) treatment services. However, there is limited literature on how these disruptions eventually impacted the service users. We aim to present longitudinal outcomes of substance users enrolled at our centre.

METHOD: In response to COVID-19 disruptions our centre shifted to a hybrid model of care. We telephonically collected baseline data of service users from a tertiary care Centre in North India in April 2020 and followed up after 12 months, enquiring the clinical details. RESULTS: Response rate was 66%. The most common substance for which treatment was sought were opioids (54.8%) and alcohol (32.8%). About half (51.7%) of the respondents relapsed over this period, with majority relapsing in < 3 months (36%) and 3-6 months (32.6%) of their last contact. The most common reason attributed to relapse were increased boredom (32%) and inability to continue treatment (27.7%) due to the pandemic. Only 2/5th of service users reported any hospital visit during this period with most common challenge being the travel related difficulties (52%).

CONCLUSION: SUD treatment disruption due to COVID-19 had severe impact on service users, with majority dropping out of treatment and relapsing eventually.

Shall I Stay and Try Harder or Leave? Focusing on The Identified Relationship Foundation and Dynamics to Study the Experience of Perceived Faded Affection, and Coping Strategies to Deal with The Emerging Changes in Dating Relationships

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Abstract: This study investigates the fading of affection in dating relationships, which goes beyond the phenomenon of the end of honeymoon phase. This being a relatively unexplored area of relationship, the aim of the study was established to identify the underpinnings of fading affection and highlight the myriad ways of coping with the perceived lost affection to restore the relationship. Other important goals included identifying the factors salient to fading affection. Purposive snowball sampling was employed to appoint the participants from India. We used phenomenology and obtained the data through in-depth, one on one interviews of 15 individuals, which comprised 13 females, and 2 males, who have experienced feelings of fading affection. Results highlighted the pathway of experiencing perceived fading affection, the beginning, and continuation of fading affection in participants and their partners, and the role of vulnerability in securing affection. We also underlined the patterns among participants that of limerence, and among the participant's partners that of toxicity, both of which facilitated trauma bond, impacted unworthiness, and influenced the efforts to remedy the situation. Further results showed that the experience of fading of affection as a process, which comprises accompanied feelings, and behavior over the course of the relationship, contradictions, and coping mechanisms based on participants' narratives. Thoughts that developed, or reinforced as the affection fluctuated were also identified and discussed with the participants. The results further indicated the discovered pathway to building a weak foundation for the relationship, while highlighting the differences between healthy, and unhealthy relationships. The result concluded the experience of fading affection in the relationship as a common phenomenon, but different in terms of experiencing it based on the foundation, patterns, and individual contributions (self-worth, attachment wounds) in the relationship.
Keywords: Affection, Self-Betrayal, Limerence Attachment Wounds, Conflict Management, Trauma Bond

The Universal Basic Education Policy (Ube) and the Right to Education in Rural Nigeria

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Abstract: The UBE policy is the product of Nigeria's commitments to international agreements on education and human rights on the aegis of the United Nations such as the Universal Declaration of Human rights (UDHR) Convention on the Rights of the Child (CRC), Education for All (EFA), and the Millennium Declaration Goals (MDGs) to mention a few. It stipulates that, "Basic education shall be universal, free and compulsory". The essence is to guarantee quality basic education for all. However, in the implementation of the UBE policy; the rural dwellers have been excluded. In addition, quality has not been assured. This paper discusses the UBE policy in relation to the education rights of the rural dwellers that constitute 70% of Nigeria's population. Finally, it suggests ways of realizing the objectives of the policy in rural Nigeria.
Keywords: Basic Education, Human Rights, Rural, Policy
Introduction: Education is a highly veritable commodity for the emergent global societies that no developing nation can continue to ignore because it is acknowledged as a major determinant of national development in all its ramifications. In fact, education has become a major determinant of living standards. Consequently; nations and individuals with limited or no access to the skills, knowledge and dispositions fostered by education will fall behind others in developmental strides. Hence the level of education, in terms of access to and quality is the mirror of the nation's level of development. In recognition of the fact

that quality education is an indispensable resource that engineers and sustains national development, the United Nations declared education a human right. This implies that limited access to and or poor-quality education are infractions of human rights of the victims. Nigeria is a state party to international and regional instruments/laws on education. These include the Universal Declaration of Human Rights (UDHR), Convention Against Discrimination in Education, Convention on the Elimination of All Forms of Discrimination Against Women-CEDAW, Convention on the Rights of the Child – CRC, The African Union Charter on The Rights and Welfare of The Child, Copenhagen Declaration, Education for All-EFA initiative, Dakar Framework of Action and the Millennium Declaration (2000). In line with her commitments to these international and regional laws one education rights, Nigeria has embarked on various education reforms over the years. One of these reforms is the promulgation of the UBE Act of 2004. (NERDC). The UBE policy guarantees basic education for all Nigerians irrespective of age, sex, ethnic origin and place of residence/location. The implementation of the UBE policy is yet to actualize its goals; in fact, it has missed its targets. This is sustained by the recent revelation that over 10.5 million Nigerians of primary school age are out of school. Non school attendance is highest among the states in the NorthWest and North East zones; 72% of primary age children never attended school in Bornu state. According to the US Embassy in Nigeria (2012) the factors influencing primary school drop-out are monetary cost (32%), Insufficient Interest (26%), Labour Needed (16%), Unlikely Able to Join Junior Secondary School (JSS) (9%), Unfavorable Distance (7%), Hard Enough Schooling (6%) and Poor-Quality School (4%). In addition; is the failure of adult education programmes especially in the rural areas of Nigeria? The most recent National Literacy Survey reveals that literacy rate in the urban areas is 74.6 % as against48.7% in the rural areas. Also in 17 out of 36 states and the Federal Capital Territory Abuja, the adult literacy rates range from 14.5% to 49.3%. (NLS,2010).This clearly shows that most of the illiterate and uneducated population are rural dwellers. It is also an indication of inequity of access to and that quality of basic education is not assured. These situations constitute infractions of the education rights of rural dwellers in Nigeria. Context: The Federal Republic of Nigeria comprises 36 states and the Federal Capital Territory, Abuja. These states are grouped into six geo-political zones for political expedience: North West, North East, North Central, South South, South West and South East. (Eme-Uche,2010) There are 774 local government areas in Nigeria. (FGN,1999). Nigeria is the most populous nation in sub-saharan Africa with an estimated population of 168 million.70% of this population are rural dwellers. Evidence from the Rural Poverty Report 2011 (IFAD,2010) shows that rural poverty is very high in Africa (excluding North Africa). In NIGERIA, Poverty, illiteracy, disease and isolation characterize the rural areas. Socio – economic amenities are inadequate or not available in most of the locations. The dominant occupation of Nigeria's rural dwellers is subsistence agriculture. This has its toll on the rural children because families are compelled by their circumstances to engage them in farm work and other income generating ventures. This has its implications for school enrollment, attendance, retention and the performance of the children at school. This situation is not peculiar to Nigeria and developing nations. It is also a feature of more developed nations like the United States of America where poverty equally ravages rural dwellers. O'Hare (2009) observes that poor children living in America facesignificant challenges just as their urban counterpart; but many problems are exacerbated by theirisolation and limited access to support services that are common in urban areas. Background to the Universal Basic Education Policy: The first education reforms in Nigeria were initiated by the then Western Region and Eastern Region governments in 1955and 1957 respectively. This was most expedient because of the need to revise the colonial education curriculum to make it responsive to the needs of the emergent nation, Nigeria. These efforts although ground breaking at that time, were limited in their scope of application and curriculum content. The first national and large-scale initiative was the free Universal Primary Education scheme launched by President Obasanjo in 1976. It resulted to a phenomenal increase in access to educationat all levels. At the basic education level, school enrollment moved up from 6million to 12 million. (Essn,1976). The UPE was free and universal. This was perhaps the world's highest rate of education expansion, but also, it set in motion the greatest crisis in education in the country. (Ukeje, 1998). The identified constraints of the UPE policy were inadequate funding, poor infrastructural facilities, insufficient qualified teachers, poor planning, inaccurate data, poor supervision and monitoring of the programme (Denga, (2000), Ocho (2005) and Maduewesi (2005). It is important to

note that although the government declared the UPE scheme universal and free, schools-imposed dues and levies for the provision, maintenance and/or improvement of facilities and services. These levies were, in some cases higher than fees paid before the UPE scheme. In addition, parents and guardians assumed responsibilities for other school needs of their children/wards such as school uniform, shoes, text books, exercise books, transportation etc. These made the UPE scheme far from being free and limited to those who could pay the bills. Consequently, rural and urban poor children whose parents could to pay the bills were excluded. The UPE scheme provided six years of free primary education; however, it was not compulsory. So the state did not assume responsibility for the education rights of the child. This was in contravention of Nigeria's commitments to the earlier mentioned international/regional education rights laws. The UBE Act was promulgated in 2004, that is, 28 years after the UPE was launched. The state assumed full responsibility for the child's education hence the free and compulsory component of the Act. The UBE (2004) and the National Policy on Education -NPE (2004) are the instruments for the realization of the six EFA goals, Goal 2 of the MDGs – Universal Primary Education and the home grown National Economic Empowerment and Development Strategy (NEEDS) and the Vision 20, 20;20. Education as a Human Right: The indispensability of education in the fostering, protection and sustenance of the dignity of the human person is incontrovertible. This fact informed the collective efforts of the international community individually, at the state and corporately at the international/ regional levels on the aegis of international/regional bodies to guarantee unfettered access to basic education. The United Nations and its agencies have been in the forefront of this struggle. Nigeria is a signatory to significant international lhuman rights laws /instruments on education rights that have and are still influencing education reforms in Nigeria. Nigeria is a state party to the following international /regional human rights laws that guarantee the right to basic education: Universal Declaration of Human Rights. Article 26 states: (1) Everyone has the right to education; Education shall be free, at least, in the elementary and primary stage. Elementary education shall be compulsory. B. International Covenant on Economic, Social and Cultural Rights. According to Article 13 (1) primary education shall be compulsory and available free to all. C. Convention against Discrimination in Education. Articles 3 and 4 mandate State parties to: undertake to discontinue any practice which involves discrimination in education and to make primary education compulsory and free. D. Convention on Elimination of all forms of Discrimination Against Women (CEDAW). Articles 2, 5, 10 and 12 protect the education rights of women and the girl-child. E. The Convention on the Rights of the Child (CRC). Article 28 of this convention acknowledges the rights of the child to unlimited access to free and compulsory primary education. F. World Declaration on Education for All, (EFA): Article1 and Preamble of EFA (1990) provide that Education is a fundamental human right of all people men and women of all ages throughout the world…G. Declaration and Program of Action of the World Summit for Social Development adopted during the UN Copenhagen World summit. Commitment 6 unequivocally stresses the commitment of State to the goals of universal and equitable access to quality education for all without any form of discrimination H. The Dakar Framework of Action, Captioned Education for All: Meeting Our Collective Commitments adopted by the World Forum on Education. (i) expanding and improving comprehensive early childhood care and education, especially for the most vulnerable and disadvantaged children;(ii) ensuring that by 2015 all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to and complete, free and compulsory primary education of good quality I. Millennium Declaration OF 2000: Goal two is the eradication of illiteracy through compulsory free basic education. J.African Union Charter on the Rights and Welfare of the Child-1990 guarantees every child's right to education .k. ILO Convention 182 on Age Employment and ILO Convention 138 on Elimination of Worse Forms of Labour Nigeria is a signatory to the above instruments on education rights. They have had tremendous impact on the education policies of the Nigerian state. Policies and actions of government taken to safe guard education rights include; Constitutional Provisions: In chapter 11 of the 1999 constitution is on the Fundamental Objective sand Directive Principles of State Policy clearly state Nigeria's education all objectives in section 18 thus.

Symptom Profile Following Cumulative Mild Traumatic Brain Injury in Early Adolescent Rugby Union Players in South Africa

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Abstract: The symptom profiles of young adolescent rugby and noncontact sport were investigated over one sport season. In a non-equivalent quasi-experimental design, a group of rugby players (n = 99) were compared with a demographically equivalent group of noncontact sport participants (n = 74). The computerised ImPACT post-concussive symptom scale was employed to assess and compare pre-season and post-season assessment of both groups. Independent comparative analyses revealed that the damaging effects due to exposure to the concussive and sub-concussive incidents appear to be more pronounced in the rugby group in terms of symptomatic presentation relative to controls.
Keywords: Cumulative Mild Traumatic Brain Injury, Adolescent Male, Rugby Players

The General Impact of Self-Stigma of Mental Illness on Adult Patients with Depressive Disorders: A Systematic Review

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Abstract: **Background**: Mental illness stigma is often found to impact mentally ill patients. This stigma can come from others or from the patients themselves, which is called 'self-stigma'. Self-stigma is associated with depressive disorders. The present study explored the widespread impacts of self-stigma on adult patients with depression. Additionally, this researcher compared self-stigma levels among psychiatric disorders.
Methods: A narrative systematic review was conducted using the JBI approach as a guideline. The search process was performed via research databases including MEDLINE, EMBASE and CINAHL. The included studies were limited to the English language studies that were published from 2016 and onwards.
Results: Eight cross-sectional studies were included in this systematic review, and 28 studies were excluded for not fulfilling the inclusion criteria of the review. The findings were extracted and synthesized into three main categories negatively affected by self-stigma of depression. These are: (1) the impact on the quality of life, (2) the impact on self-esteem and (3) the impact on self-worth. Moreover, in regard to the comparison of self-stigma levels among psychiatric disorders, self-stigma for people with schizophrenia was higher than self-stigma of depression.
Conclusion: Self-stigma of depression has negatively impacted multiple aspects of the patient's life. Thus, the review brings the following recommendations: increase community awareness, educate the nursing staff, include mental illness stigma in academic curriculums and establish educational and assessment programs by nursing managers to assess newly joined mental health nurses.

Immunomodulatory Effects of Beta Vulgaris (Sugar Beet) Extract against Experimentally Induced Coccidiosis

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Abstract: Coccidiosis is an infectious disease chicken caused by Eimeria Parasite which have various species of Eimeria causing heavy economic losses to poultry farming in Pakistan and different parts of word. Current study reports immunomodulatory effect of Beta vulgaris (root extract) against experimental coccidiosis in broiler chicken. For evaluation of immunomodulatory potential, a total 175-day old broiler chicks were divided into five equal groups. Mixed Eimeria infection was given orally at one week of age. At same age Beta vulgaris extract was orally given at 100, 200 and 300 mg/kg of body weight in first three groups respectively. Vitamin E and PBS treated chicks served as control groups. Cell mediated immunity was inquired through PHA-P, and Dinitrochlorobenzene (DNCB) test. Humoral immunity was evaluated by hemagglutination test. Results of study showed that B. vulgaris extract treated groups showed higher cellular and humoral immune response against coccidiosis. Immunological response of groups administered with Beta vulgaris at highest dose i.e., 300 mg was higher as compared to lower dose and caused more positive effect on infected chicks.

Early Prediction of Adult-Onset Dementia by Deep Learning Models Using MRI Labelled Images

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Abstract: Adult-onset dementia disorders represent a heterogeneous class of diseases that largely affect an individual's memory loss and cognitive decline. It ranges from different stages of mild to severe and impacts physical changes in the brain. Alzheimer's disease (AD) is the most common dementia type that affects cognitive functioning, and social and behavioural skills. Early diagnosis and intervention to delay the onset of dementia are beneficial and can decrease the burden of the disease and save costs for the healthcare systems. Integrative data analysis using ML techniques is becoming increasingly popular. Deep learning is a branch of ML that focuses largely on the automatic classification of image data by learning subtle patterns from high-dimensional datasets. The use of these algorithms could lead to the early

detection of AD and the progression of the disease. For image processing, deep learning uses neural networks such as convolutional, recurrent, and artificial types. In this work, based on MRI, a deep learning model for predicting Mild Cognitive Impairment (MCI) subjects' progression to AD with the highest accuracy is proposed. During the discrimination of AD type, deep and convolutional neural networks (CNN) show significant differences in accuracy, they classified AD subjects with 97.83% of accuracy. By introducing different deep learning models to understand and check which model frameworks are really helpful in the early detection of adult-onset dementia disorders.

The Development Model of Nursing Care in Patients with Reconstructive Surgery of the Total Knee Replacement, Loei Hospital

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Abstract—Total knee replacement surgery is a treatment to correct disability and to relieve pain when medications are ineffective. Risks after surgery may include pain and surgical site infection. Within the past year, postponing the surgery due to unavailable equipment has reached 16.9 percent and the occurrences of infected wounds is 2.8 percent. Total knee replacements are limited by its elaborate surgical techniques, being time consuming and risk of contamination. While nurses faced issues such as adjusting nurses' rotation, unclear knowledge of the management and nurses' individual reasoning being inadequate knowledge and experiences. Therefore, this research aims to develop a nursing care model for patients undergoing total knee replacement surgery in Loei hospital. Using the models Kemmis and McTaggart (1988) as development guidelines. The duration for the study is from April to July 2020. The number of participant nurses and patients that had undergone total knee surgery during this period amounted to 50

nurses and 36 patients. The equipment includes nursing assessment forms, satisfaction assessment forms, reflection and brainstorm guideline. Analysis data, nominal scale will be presented in a form of frequency and percentage by comparing it with the Friedman test. While continuous data are presented as average and deviation by using Mann-Whitney U test. Proceed with the work in 2 cycles. The first cycle will aim to develop a nursing model and the second cycle aims to utilize that model as a nursing guideline. In all cycles, these four steps must be followed which includes planning, implementing, observing and evaluating. The new development results in nurses having a clear guideline for patient's care which leads to a proper assignment system and follow up techniques. Furthermore, it provides better cooperation among nurses which later inspires the development of new knowledge to be used in their field of work, this includes; a practical manual of nursing care for patients undergoing total knee replacement surgery. The outcomes are divided into 2 parts. 1) Nursing care results; nurse judgment and following standard protocol by giving correct and standard required nursing care. Evaluation of nursing behavior increased from 5.6 to 8.9 ($p<0.001$) and the incidence of postponing surgery due to unavailable equipment decreased by 12 (17 %) to 0 (0 %). Nurse's satisfaction for new regulation increased from 2.91 (very high) to 4.22 (very high). 2) Clinical results show a decrease in pain from 2.3 to 2.2 points. Incidence of swelling/redness after surgery decreased from 2 (3 %) to 0 people (0 %) and activities of daily living (ADL) increased from 15.95 to 16.47 points. In summary, the development of the new nursing model leads to changes in the system which resulted in positive feedback in nurses and patient. Factors that contributed to successful operation of this research are the nursing leader, group motivation and a cooperative nursing team that solved problems to assist with the development of this model. It is recommended to follow this model's protocols as a nursing care routine and to further develop these services in other departments such as in the outpatient department, inpatient department, operating room and continuous care.
Index Terms— Nursing Model, Total Knee Replacement, Surgery
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Attitudes, Stereotypes and Ageist Behavior of Youth Towards Older People: The Case of Georgia

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Abstract: The current study aims to investigate young people's attitudes, stereotypes and ageist behaviors towards the elderly, and the relationship of these variables to their perceptions of distance and difference from older people. Georgia has an aging society, with a high percentage of senior citizens in the population, though only a few research in the Georgian context have been conducted to study young people's attitudes towards old people. The study of ageism -related phenomenon is important both from a scientific point of view, as well as for the development of awareness raising interventions and social policy. Research instruments included in the research was adapted with 150 young people. The survey

research was carried out with 450 young people as respondents selected by means of convenient sampling in Tbilisi. The data reveals ambivalence and mixed feelings of young people towards the elderly. Young people often stereotype older people as warm and kind, but with limited cognitive capacity. Additionally, they perceive elderly people as being old-fashioned, non-competitive and having low social status. According to the Stereotype Content Model (SCM) young people have 'pseudo-positive' attitude toward older people and often represents infantilizing behavior, i.e., not letting aged people take responsibility for their own lives.

Keywords: Elderly, Stereotypes, Young People, Attitudes, Ageist Behavior

A Cross-Country Analysis of Corporate Carbon Performance: An International Investment Perspective

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Abstract: Research Objectives: • To investigate corporate carbon management efficiency globally from the perspective of country-level dispersion. • To assess the association between the Paris Agreement and corporate carbon management efficiency. • To examine the changes in corporate carbon management efficiency after the Paris Agreement in OECD vis-à-vis non-OECD countries. • To assess the association between international equity ownership and corporate carbon management efficiency before and after the Paris Agreement. • To assess whether the association between international equity ownership and corporate carbon management efficiency differ across OECD vis-à-vis non-OECD countries.

Methodology: Under the condition that the variation in corporate carbon performance within a country decreases while average firms achieve a high carbon performance, the dispersion variable (Theil index) measures the overall efficiency of improving corporate carbon management in a country. Corporate carbon management scores are from the MSCI database. The sample consists of 20,712 listed firms and 91,884 firm-year observations from 64 countries covering the 2010-2020 period. We use fixed effects regression models.

Findings: After the Paris Agreement, the average carbon performance (dispersion) of listed companies increased (decreased) more across the OECD countries vis-à-vis the non-OECD countries. Foreign investor ownership is negatively associated with the dispersion of corporate carbon performance in the post-Paris Agreement period. The decrease in the dispersion after the Paris Agreement is larger in non-OECD countries than in OECD countries.

Research Outcomes: The results imply (1) that developed countries have larger efficiency to improve carbon performance than developing countries after the Paris Agreement and (2) that sophisticated foreign investors from developed countries exert a significant positive influence on the carbon management efficiency of firms in developing countries. Thus, we deliver a novel contribution to the carbon literature and practical insights to industry practitioners and policymakers.

Future Scope: Further research could (1) use alternative measures of corporate carbon management efficiency (2) conduct regional analyses (3) examine the causality between foreign ownership and efficiency.

Keywords: ESG, Carbon Performance, International Ownership, OECD

Assessing the Accuracy of COVID-19 Rapid Antigen Test (RAT) Positive by Evidence-Based Medicine (EBM)

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Abstract: **Introduction**: From May 2021, COVID-19 began to spread around the world. Taiwan has adopted strict control strategies, including land, sea and air blockades and international exchanges, but it can still not resist the spread of the epidemic. The outbreak of COVID-19 began in March 2022. The daily number of newly confirmed patients from 20,000 to 90,000 due to high infection rates and a sharp policy shift. 2022.05.26 Changed to a positive COVID-19 Rapid Antigen Test (RAT) as a confirmed case.
Objectives: Due to changes in Taiwan's diagnostic policy, various imported rapid antigen tests (RATs) for COVID-19 significantly differ in precision and accuracy. Therefore, we wanted to use Evidence-Based Medicine (EBM) to assess the accuracy of positive COVID-19 rapid antigen tests (RATs).
Methodology: Step 1: Ask answerable questions P Suspected COVID-19 I Rapid Antigen Test C Real-Time Polymerase Chain Reaction O Diagnosis of SARS-CoV-2 or COVID-19 Step 2: Acquire the track the best evidence ❶ Use the evidence database to search the literature for 2018 to 2022, including published and unpublished studies results. ❷ Enter keywords: COVID-19 diagnostic accuracy and rapid antigen detection tests. ❸ Access database: Summary Clinical Texts: Best Practice (24 Items) DynaMed (2 Items) EBM Guidelines (1 Item) Systematic Guidelines: Guidelines in McMaster PLUS (0 Items) Systematic Reviews: ACP Journal Club (0 Items) McMaster PLUS (1 Item) ❹ DynaMed database: 0 Items Trip database: Systematic Reviews 21 Items PubMed database: Systematic Reviews 13 Items ❺ There are two articles in full compliance with the PICO; We selected one report based on the research design, the publication age, and free full-text search availability.
Results: Step 3: Appraise Critical Evaluation Article Title: Diagnostic Accuracy of Rapid Antigen Tests for COVID-19 Detection: A Systematic Review with Meta-analysis. Arshadi M, et al. Front Med (Lausanne). 2022. PMID: 35463027 Free PMC article. According to the 2011 Oxford Level of Evidence, the level of evidence for this systematic review and meta-analysis is 1a. Step 4: Apply to integrate assessment with patient preferences Diagnostic Accuracy of Rapid Antigen The pooled sensitivity and specificity of the RAT were 69% (95% CI: 68–70) and 99% (95% CI: 99–99). The PLR, NLR, DOR, and AUC estimates were found to be 72 (95%CI: 44–119), 0.30 (95% CI: 0.26–0.36), 316 (95% CI: 167–590), and 97%, respectively. The AUC estimates in this report also represented a high level of test accuracy. Deek's test result indicated no likelihood of publication bias ($P > 0.05$). The sensitivity of RAT was slightly higher in symptomatic (65%) than in asymptomatic patients (64%). Step 5: Audit evaluates the effectiveness in many patients with suspected COVID-19, RAT can quickly confirm whether the diagnosis is approved and is less expensive than RT-PCR. The accuracy was 71% for CT>25 and 67% for CT>26.
Conclusion: In Taiwan, the current diagnostic criteria are confirmation of RAT positivity, expediting the diagnosis of suspected COVID-19 patients. It is faster and cheaper than using RT-PCR as the sole diagnostic criterion. However, if there are apparent symptoms of COVID-19 and the RAT is negative, further confirmation by RT-PCR is still required.
Keywords: COVID-19, Evidence-Based Medicine (EBM), Rapid Antigen Tests (RATs), Rapid Antigen Detection Tests (RADTs), RT-PCR

Cognitive Hypnotic Psychotherapy

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Abstract: Cognitive Hypnotic Psychotherapy is a unifying approach to psychotherapy that uses hypnosis (hyper-suggestibility) as a base to seamlessly integrate all major approaches to psychotherapy i.e., Cognitive, Behavioural, Humanistic and Psychodynamics with techniques from Metaphors, Mindfulness, Guided meditations and NLP.The approach is based on the understanding that problems are multi-layered. One needs to work with a combination of these layers to be able to create lasting change. These layers include 1. Clearly defining the problem 2. Understanding and exploring the desired outcomes 3. Dysfunctional behaviours 4. Unhelpful thoughts, physical feelings and emotions 5. Limiting beliefs, conflicting values 6. Secondary gains or positive intention 7. Suppressed emotions, traumas, repressed memories. Since different approaches to psychotherapy work with different layers in different ways, integrating them into one holistic process provides us with the opportunity to comprehensively work with an issue quickly and effectively. More details about the approach along with case studies detailing the application of this approach can be found here.

Bacterial Cellulose (BC): An Emerging Future Biomaterial

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Abstract: Bacterial cellulose (BC), which produced by well-known Komagateibacter sp., often secreted as pure membranes (sheets), has received extensive study as a nanomaterial with special qualities for a wide

range of applications, but it has actually been employed primarily for biomedical ones. BC, a highly adaptable biopolymer and consists of ultrafine nanofibrils that is extruded by tiny, single-cell bacteria using chemical energy obtained from renewable substrates as their carbon source. Unlike other biopolymers that need to be extracted and purified, BC is extracellular and naturally pure compared to plant-derived cellulose. BC gained a lot of interest in the cosmetic, pharmaceutical, and medical fields due to its biological, physical, and mechanical characteristics. For the treatment of wounds, a variety of dressing styles are employed, in which having unique benefits and challenges. This makes it possible to create polymer composites and mixtures with a variety of applications. BC was initially utilized in the medical field for artificial blood vessels, tissue regeneration, and bandages for wounds. Due to its significant fluid retention and suitability for treating a variety of skin conditions characteristics for loading medications. As a temporary dressing, BC sheets are employed. This work highlights the applications of BC in biomedical and other potential applications.

Keywords: Bacterial cellulose, Komagataeibacter, Nanomaterial, Applications, Biomedical

A Questionnaire to Assess Nursing Compliance to Practices Related to Central Line Care in Our Hospital to Prevent and Reduce the Rates of Central Line Associated Bloodstream Infections (CLABSI)

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1. Background:

1.1 Introduction

Central Venous Catheters (CVC) play an essential role in the management of patients with chronic medical conditions who require complex care. They are highly imperative for regular medication administration and blood sampling when it is difficult to gain or maintain a peripheral access, and for delivery of specialized treatment such as hemodialysis and parenteral nutrition. Despite their utility, these devices predispose patients to various complications including the risk of a Central Line Associated Bloodstream Infections (CLABSI) [1-2]. Typically, non-tunneled catheters are more susceptible to CLABSI, and this risk is further potentiated by long duration of indwelling, extensive replacement, frequent repositioning, and poor handling [3]. CLABSI are most commonly caused by Gram Positive organisms and are considered a major cause of prolonged hospitalization and increased mortality [2-3].

Pathogens responsible for causing CLABSI include coagulase negative Staphylococcus spp. (37.8%) followed by Enterococcus (11.2%), Staphylococcus aureus (9.3%), Enterobacter spp. (6.2%), Candida Albicans (5.5%), Pseudomonas aeruginosa (4.9%), and Klebsiella pneumonia (4.1%) [2].

The Centers for Disease and Control prevention (CDC) has developed guidelines [4] for the prevention of CLABSI, which enable facilities to assess effectiveness of applied prevention efforts. At the bulk of those guidelines are recommendations for nurses regarding handling and maintenance of central lines in the ICU and non-ICU settings.

1.2 Objective

- Assess awareness and perceptions of policies and practices related to CLABSI prevention within the nurses in our hospital.
- To implement a surveillance program for central line associated bloodstream infections.
- Determine if compliance to these preventative measures reduces the rate of CLABSIs.

2. Methods

2.1 Audit Plan

- We adopted the CDC guidelines for handling and maintenance of CVCs and assessed the compliance rate by distributing an online questionnaire to all nurses involved in in-patient care.
- The questionnaire consisted of 15 questions which assessed the awareness and compliance of nurses to those guidelines, and how often do they adhere to them.

2.2 Guidelines

- The questionnaire was based on the 2011 CDC guideline for prevention of intravascular catheter-associated bloodstream infections. Those guidelines targeted healthcare professionals responsible for handling, surveillance, and control of infections in hospital, outpatient, and home healthcare settings.

3. Results

3.1 First cycle

The first cycle involved 32 nurses from the in-patient pediatric wards. The results of their compliance to each specific guideline are as follows:

CDC Guidelines Percentage

1 Are central lines maintained and accessed only by trained personnel who have demonstrated competency? 90.6%

2 Is hand hygiene performed before and after replacing, accessing, repairing, or dressing the catheter? 96.9%

3 Are catheters accessed with only sterile devices? 93.8%

4 Are access ports or hubs scrubbed immediately prior to use with an appropriate antiseptic (e.g., chlorhexidine, povidoneiodine, an iodophor, or 70% alcohol)? 93.8%

5 Are dressings changed using aseptic technique using clean or sterile gloves? 100%

6 Is clean skin prepared with >0.5% chlorhexidine with alcohol during dressing changes (or if chlorhexidine is contraindicated, tincture of iodine, an iodophor, or 70%alcohol as alternatives)? 81.3%

7 Are dressings that are wet, soiled, or dislodged immediately replaced? 87.5%

8 For temporary central lines, are gauze dressings changed every 2 days or semipermeable transparent dressing at least every 7 days (except in pediatric patients in which the risk for dislodging the catheter may outweigh the benefit of changing the dressing)? 81.3%

9 Are patients encouraged to report changes or new discomfort related to their central line? 93.8%

10 Are insertion sites monitored visually during dressing changes or by palpation through intact dressing for tenderness or other signs/symptoms of infection regularly (e.g., daily)? 93.8%

11 Are administration sets that are used continuously in patients (those not receiving blood, blood products, or fat emulsions) replaced every 4 days to 7 days? 78.1%

12 Is tubing used to administer blood, blood products, or fat emulsions replaced within 24 hours of initiating infusion? 93.8%

13 Is tubing used to administer Propofol infusions replaced every 6-12 hours, when the vial is changed, according to manufacturer's recommendations? 71.9%

14 Are needle-less components changed at least as frequently as the administration set and no more frequently than every 72hours (or according to manufacturer's recommendations)? 87.5%

15 Do personnel collecting blood cultures attempt to use peripheral sites before using the central line? 43.8%

	CDC Guidelines	**Percentage**
1	Are central lines maintained and accessed only by trained personnel who have demonstrated competency?	90.6%
2	Is hand hygiene performed before and after replacing, accessing, repairing, or dressing the catheter?	96.9%
3	Are catheters accessed with only sterile devices?	93.8%
4	Are access ports or hubs scrubbed immediately prior to use with an appropriate antiseptic (e.g., chlorhexidine,	93.8%

	povidoneiodine, an iodophor, or 70% alcohol)?	
5	Are dressings changed using aseptic technique using clean or sterile gloves?	100%
6	Is clean skin prepared with >0.5% chlorhexidine with alcohol during dressing changes (or if chlorhexidine is contraindicated, tincture of iodine, an iodophor, or 70%alcohol as alternatives)?	81.3%
7	Are dressings that are wet, soiled, or dislodged immediately replaced?	87.5%
8	For temporary central lines, are gauze dressings changed every 2 days or semipermeable transparent dressing at least every 7 days (except in pediatric patients in which the risk for dislodging the catheter may outweigh the benefit of changing the dressing)?	81.3%
9	Are patients encouraged to report changes or new discomfort related to their central line?	93.8%
10	Are insertion sites monitored visually during dressing changes or by palpation through intact dressing for tenderness or other signs/symptoms of infection regularly (e.g., daily)?	93.8%
11	Are administration sets that are used continuously in patients (those not receiving blood, blood products, or fat emulsions) replaced every 4 days to 7 days?	78.1%
12	Is tubing used to administer blood, blood products, or fat emulsions replaced within 24 hours of initiating infusion?	93.8%
13	Is tubing used to administer Propofol infusions replaced every 6-12 hours, when the vial is changed, according to manufacturer's recommendations?	71.9%
14	Are needle-less components changed at least as frequently as the administration set and no more frequently than every 72hours (or according to manufacturer's recommendations)?	87.5%
15	Do personnel collecting blood cultures attempt to use peripheral sites before using the central line?	43.8%

Figure 1 (Guideline No. 2):

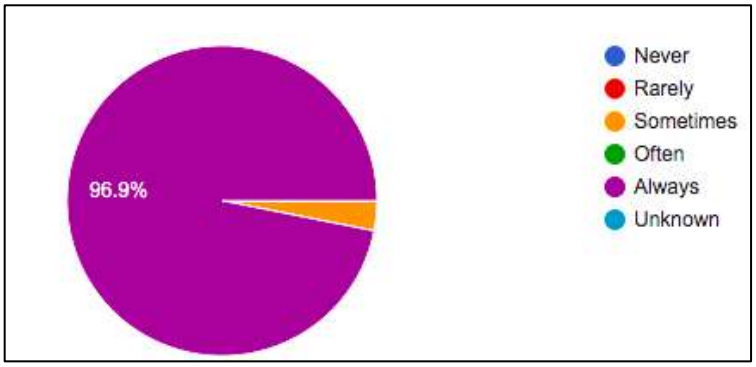


Figure 2 (Guideline No. 6)

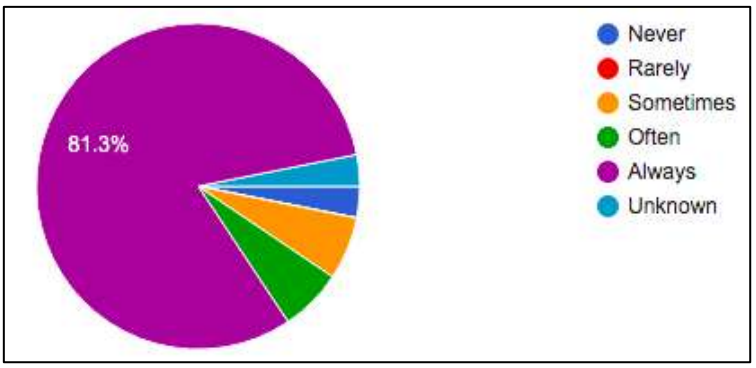


Figure 3 (Guideline No. 8):

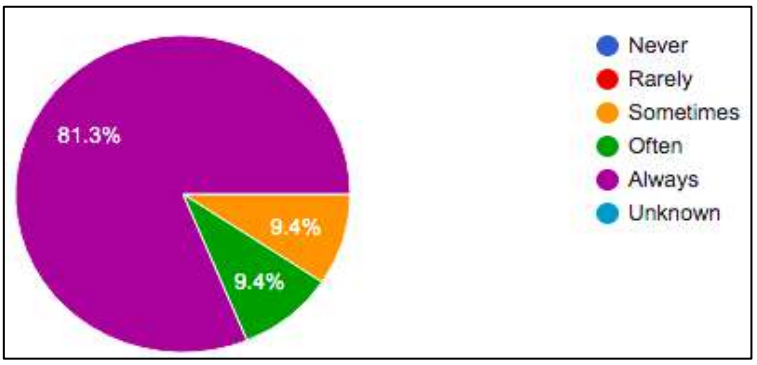
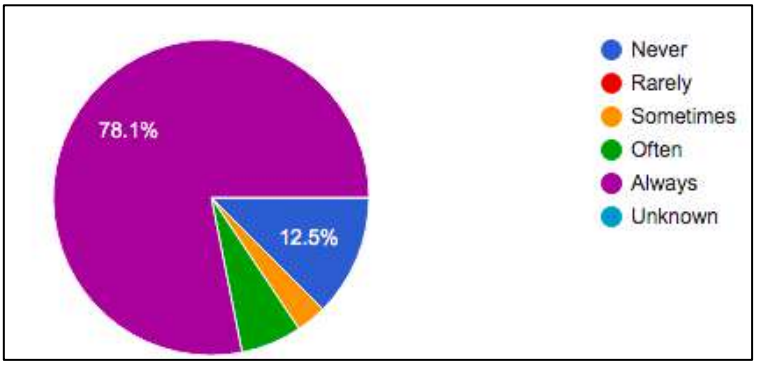


Figure 4 (Guideline No. 11)



3.2 Recommendations

- Central lines should be only maintained and accessed by trained personnel
- Disinfect catheter hubs, needleless connectors, and injection ports before accessing the catheter
- Administration sets used for patients with prolonged hospitalization should be replaced every 4 to 7 days.
- Pay closer attention to the dressings and the area around it.
- Dressings that are wet, soiled, or dislodged should be immediately replaced
- Use chlorhexidine-containing dressings for CVCs
- Use antimicrobial locks for CVCs
- Assess the need for continued intravascular access on a daily basis during multidisciplinary rounds, and remove non-essential catheters
- Ensure appropriate nurse-to-patient ratio and limit the use of float nurses in ICUs
- Perform regular surveillance for CLABSI in ICU and non-ICU settings and measure the unit-specific incidence of CLABSI

3.3 Second cycle

A leaflet containing all the above recommendations was distributed to all the nurses involved in handling central lines. They were advised on proper central line care techniques to reduce the risk and prevalence of central line infections. The head of infectious disease department was informed regarding deficiencies in our hospital guidelines. A second questionnaire was preformed and distributed to the nursing staff and it showed significant effect and improvement in adherence to the guidelines by 60%. We have also contributed to development of strategies that increased adherence to local guidelines.

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Type Of Residence, Physical Activity and Chronic Diseases in Indonesia

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Abstract: Globally, chronic diseases are believed to cause of 74% of all deaths. We evaluated the Indonesia Family Life Survey (IFLS4) cross-sectionally with 8,403 Indonesian individuals aged 22 to 97. In order to compare the prevalence of chronic diseases among subjects according to their type of residence and physical activity, we used the chi-square test. Urban and rural dwellers had slightly similar numbers (52.41% and 47.9%, respectively). Only 29.62% of individuals were active. Nevertheless, urban dwellers were more likely associated with diabetes mellitus and stroke ($p<0.001$ and $p=0.05$, respectively). However, compared to the less active group, active individuals had significantly lower percentages of chronic illnesses like diabetes mellitus, TB, asthma, stroke, and heart disease. Finally, chronic diseases such as diabetes and stroke are more common in urban areas. On the other hand, those who are physically active experience lower chronic diseases than those who are less active. Expanding the type of residence and physical activity differences by incorporating confounding variables will help explore this underlying public health concern.

Interrogating the Use of the Biopsychosocial Model in Professional Psychology Training

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Abstract: Professional psychology as an allied health profession is a complex practice that has struggled for relevance in South Africa. This paper closely interrogates one peculiarity that occurs during professional training that may contribute to this: This is the continued (mis)use and transposition of the biopsychosocial model from the medical encounter to both psychological care and case formulation. The use of the biopsychosocial model in professional psychology training remains unquestioned. I question its value and use in training by discussing the history of the model and outlining its critiques in order to suggest alternative integrative models in the training of professional psychologists. These include critical health

psychology, evolutionary psychology and, in placing the discipline within current use and developments of technology, also considering a biocybersocial model. However, the tradition of discursive use of the biopsychosocial model in policy, training, and practice presents barriers to change. Counselling psychologists, in particular, via their role as activists for the profession of psychology, can contribute to innovative models to replace the use and rhetoric of the biopsychosocial model; but this needs to happen during professional training.

Relationship Between Parents Education Level, Parental Attachment, Subjective Social Status, and Future Orientation on Adolescent's Attitude Towards Early Marriage

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Abstract: Early childhood marriage in South Kalimantan is still high, even in 2017 South Kalimantan was ranked first with an early marriage rate reaching 32.12%. Meanwhile, the early marriage rate at the national level is only around 11.54% (Susanto, 2021). This figure is still much lower than the actual events in the field. The Office of Women's Empowerment and Child Protection (PPPA) of South Kalimantan has noted that during 2018-2020 there were 1219 cases of child marriage under the dispensation of the Ministry of Religion. Even though the religious court itself recorded a higher figure, namely 1419 cases. This research uses a type of correlational quantitative method. This method connects one variable to another through statistics. Sampling in this study used a purposive sampling technique, namely a sampling technique that uses certain criteria. The conclusion is the parent's educational level ($p<0,05$) and future orientation ($p<0,05$) have significance correlation to adolescent's attitude towards early marriage and the calculated F value is 44.564 > F table 2.48, so it can be concluded that parent's education level, parental attachment, subjective social status, and future orientation are accepted which means there is a simultaneous influence on attitude towards early marriage.
Keywords: Parent Education, Appendix, Subjective Social Status, Future Orientation, Early Marriage.

How can (A) I Help you Today? Clinician Perspectives on the Adoption of Ai Enabled Psychotherapies

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Background: As we work to surpass the effects of the COVID-19 pandemic, we are observing an insurgence of a mental health (MH) crisis presenting at an already overwhelmed primary care service. Despite the efficacy of existing counselling and therapy services, patients in the UK have had to wait up to four years to receive therapeutic treatment for depression and anxiety. The development of AI-based psychotherapy applications (AI-PAs) could serve as a potential solution to long waiting lists for cognitive behavioural therapy, but what do general practitioners (GPs), the gatekeepers of mental healthcare provision, think of the challenges to implementing these apps in everyday clinical practice? This study aims to understand the barriers and facilitators to the adoption of AI-based psychotherapy apps into primary care so that AI-PAs can be appropriately recommended for patients with symptoms of anxiety and/or depression. We aim to do this by understanding the perceptions of General Practitioners (GPs) when it comes to the potential of recommending these apps and identifying key areas for policy makers.
Method: Firstly, we elucidated the strengths and limitations of AI-PAs by conducting a systematic literature review using Medline, Embase, PsychInfo, Psych Articles and Scopus (total included n = 12). Secondly, we embarked on an exploratory mixed-method primary data collection approach involving semi-structured interviews with General Practitioners (n = 11), followed by a cross-sectional survey (n = 30).
Results: The barriers and facilitators identified were stratified into three meta-themes: organisational, technological and physician factors. Implementable recommendations developed include an interactive artificial intelligence (AI) psychotherapy app workshop; an international AI conference; an informative website; a BAME community targeted focus group and testimonial posters from AI champions.
Conclusion: AI-PAs have the potential to support and reinvigorate mental health treatment as AI therapists have evolved the ability to augment some traits of human therapists. Synthesis of published literature revealed many strengths to AI-PAs. As this is the first study to explore barriers and facilitators for the adoption of AI-PAs in GPs, future research should also explore the perspective of other key stakeholders such as psychiatrists and patients to paint a more holistic picture of the current landscape.

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