

From Lab to Leadership

Women Shaping the Future of Neuroscience

*Calling all neuroscience enthusiasts, researchers, students, educators and advocates for gender diversity in **STEM***



Conference Proceeding

From Lab to Leadership

Women Shaping the Future of Neuroscience

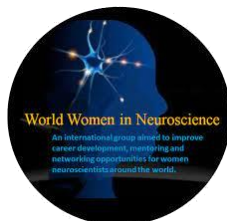


Thank you
to our collaborators and organizers

Organizers



Collaborators



ALBA NETWORK
Towards diversity and equity in brain sciences



From Lab to Leadership

Women Shaping the Future of Neuroscience



Team PASBAN & AEIRC (Executive Committee)

Founding President PASBAN

Prof. Dr. S. Ather Enam
Prof Neurosurgery, AKUH

President

Dr. Sadaf Ahmed
Associate Professor, University of Karachi
Executive Member, WWN

Vice President

Prof. Dr. Arif Herekar
HoD, Dept of Neuroscience, Baqai Medical
University

General Secretary

Dr. Shamoon Noushad
Director QEC, Malir University of Science and
Technology

Treasurer

Dr. Fazal Arain
Assistant Prof, Dept of Biomedical Sciences,
AKUH

Member

Prof. Dr. Nikhat Siddiqui
Merituous Professor, University of Karachi

Member

Prof. Dr. Touqeer Ahmed
Professor, National University of Science and
Technology

Member

Dr. Sonia Siddiqui
Associate Professor, Dow University of Health
Science

Member

Dr. Nouman Mughal
Assistant Professor, AKUH

Member

Dr. Nasir Raza Awan
Professor, Sharif Medical and Dental College

Organizing Committee

Patron

Prof. Dr. Iqbal Khan
Vice Chancellor,
Shifa Tameer-e-Millat University, Islamabad-
Pakistan

Co-Patron(s)

Prof. Dr. Tausif A. Rajput
Dean Faculty of Pharma & Allied Health Sciences,
Shifa Tameer-e-Millat University, Islamabad-
Pakistan

Prof. Dr. Aamir Waheed Butt
HoD, Dept. Rehabilitation Sciences,
Shifa Tameer-e-Millat University, Islamabad-
Pakistan

Conference Chair

Dr. Saima Gul
Associate Professor, Depart. Rehabilitation
Sciences, Shifa Tameer-e-Millat University,
Islamabad-Pakistan

Conference Co-Chair

Prof. Dr. Sagheer Ahmed
Director ORIC,
Shifa Tameer-e-Millat University, Islamabad-
Pakistan

From Lab to Leadership

Women Shaping the Future of Neuroscience



Advisory Committee

Prof. Dr. Muhammad Tahir Khalily
Dean FSSH,
Shifa Tameer-e-Millat University, Islamabad-Pakistan

Prof. Dr. Muhammad Tanvir Afzal
Dean College of Computing,
Shifa Tameer-e-Millat University, Islamabad-Pakistan

Prof. Dr. Maimoona Siddiqui
Director, Medical Education & SCOPE,
Shifa Tameer-e-Millat University, Islamabad-Pakistan

Dr. Muhammad Manan Haider
Associate Professor,
Department of Rehabilitation Sciences,
Shifa Tameer-e-Millat University, Islamabad-Pakistan

From Lab to Leadership

Women Shaping the Future of Neuroscience



Preface

This event, "From Lab to Leadership: Women Shaping the Future of Neuroscience," is a celebration of the pivotal role women play in shaping the future of brain and mind sciences. Organized by Shifa Tameer-e-Millat University in collaboration with PASBAN (Pakistan Society of Basic and Applied Neurosciences) and IBRO (International Brain Research Organization), the event highlights the challenges, achievements, and contributions of women in neuroscience and related STEM fields.

The program brings together a diverse group of participants, including researchers, educators, students, and advocates for gender diversity, to engage in meaningful discussions and share insights. With a blend of panel discussions, career development workshops, poster sessions, a diversity fair, and mentorship opportunities, the event aims to inspire, empower, and pave the way for more inclusive leadership in neuroscience.

As we gather to discuss strategies for bridging gaps, fostering innovation, and empowering women in STEM, this platform serves as a beacon of hope and progress. We hope the event inspires participants to take bold steps in their careers and leadership journeys, contributing to a future where diversity drives excellence in neuroscience and beyond.

Welcome to a day of learning, collaboration, and inspiration!

From Lab to Leadership

Women Shaping the Future of Neuroscience



Messages

Patron

Prof. Dr. Muhammad Iqbal Khan

Vice-Chancellor, Shifa Tameer e Millat University, Islamabad, Pakistan

As the Vice-Chancellor of Shifa Tameer-e-Millat University, I take immense pride in supporting this landmark conference, "From Lab to Leadership: Women Shaping the Future of Neuroscience." This event underscores the transformative power of diversity in advancing neuroscience, celebrating the contributions of women who bridge the gap between groundbreaking research and visionary leadership.

I would like to specially acknowledge the exceptional efforts of Dr. Saima Gul, whose dedication and vision as Chief Organizer have been instrumental in bringing this event to fruition. Her unwavering commitment to highlighting the contributions of women in neuroscience reflects her passion for fostering a culture of inclusion, excellence, and innovation.

I also extend my heartfelt gratitude to our esteemed collaborators, both international and national, including the International Brain Research Organization (IBRO), the Advance Educational Institute and Research Centre (AEIRC), and the Pakistan Society of Basic & Applied Neuroscience (PASBAN). Your invaluable partnership with Shifa Tameer-e-Millat University has been pivotal in ensuring the success of this event.

Together, let us continue to champion progress in science, inspired by the remarkable women shaping the future of this vital field.

Co-Patron

Prof. Dr. Tausif A. Rajput

Dean, Faculty of Pharma and Allied Health Sciences, Shifa Tameer e Millat University, Islamabad, Pakistan

It is my utmost gratitude and privilege to welcome you all to this conference. This event not only highlights the remarkable contributions of women in the field of neuroscience but also serves as a platform to inspire, engage, and empower the next generation of researchers and practitioners.

Neuroscience, as a multidisciplinary domain, continues to unlock the mysteries of the human brain, paving the way for breakthroughs in health and well-being. Women have been at the forefront of this exploration, bringing innovative ideas, pioneering research, and compassionate care to the field. This conference celebrates their achievements while encouraging more inclusive participation in this dynamic discipline.

From Lab to Leadership

Women Shaping the Future of Neuroscience



The Faculty of Pharmaceutical and Allied Health Sciences is committed to fostering excellence in research and collaboration. Hosting this conference aligns with our mission to promote interdisciplinary learning and champion gender equity in scientific endeavours. The diverse range of topics covered by the abstracts in this book reflects the depth and breadth of expertise that participants bring to this gathering.

I extend my heartfelt gratitude to the organizers, speakers, contributors, and delegates for making this event possible. May this conference spark meaningful discussions, nurture collaborations, and inspire future milestones in neuroscience.

Wishing you all an intellectually stimulating and rewarding experience.

Co-Patron

Prof. Brig. Dr. Aamir Waheed Butt

Head, Department of Rehabilitation Sciences, Shifa Tameer e Millat University, Islamabad, Pakistan

On behalf of the Department of Rehabilitation Sciences and as the Co-Patron of this esteemed conference, it is my profound Honor to express my heartfelt gratitude to our collaborators: the International Brain Research Organization (IBRO), the Advance Educational Institute and Research Centre (AEIRC), and the Pakistan Society of Basic & Applied Neuroscience (PASBAN). Your invaluable partnership with Shifa Tameer-e-Millat University (STMU) has been instrumental in the successful organization of this conference.

This conference stands as a beacon of inspiration, showcasing the transformative contributions of women leaders in neuroscience. It reflects the significant strides made by women in research, clinical practice, and innovation, paving the way for future generations. Neuroscience, with its complexities and vast potential, demands inclusive leadership, and the remarkable achievements of women in this field are a testament to the strength of diverse perspectives.

The abstracts within this book represent the culmination of dedicated efforts, groundbreaking ideas, and collaborative endeavours from across the region. These contributions underline the conference's commitment to fostering an environment where leadership, knowledge, and innovation thrive. I extend my heartfelt gratitude to the organizing committee, participants, and contributors who have made this event a success. May this abstract book inspire, educate, and empower us all to continue driving progress in the field of neuroscience.

Wishing everyone a productive and memorable conference experience!

From Lab to Leadership

Women Shaping the Future of Neuroscience



Founding President

Prof. Dr. S. Ather Enam

Pakistan Society of Basic & Applied Neuroscience (PASBAN), Pakistan

It is my honor to extend heartfelt congratulations and deepest appreciation to all those who contributed to the successful execution of the "Lab to Leadership: Empowering Women Neuroscientists" event.

From the earliest days of my journey in neuroscience, I have firmly believed in the exceptional potential of women in this field. Time and again, women have demonstrated not only their capabilities but their capacity to pioneer innovation and lead transformative change in the sciences. Their perspectives and contributions bring unique and invaluable insights, driving progress in ways that benefit humanity as a whole. As the Founding President of PASBAN, I have always envisioned this platform as one that is deeply inclusive—a space where women neuroscientists are empowered to lead, thrive, and shape the future of neuroscience. When everyone, irrespective of gender, is given the opportunity to grow and contribute, our society and science as a whole are enriched.

I would like to extend my profound gratitude to Dr. Sadaf Ahmed, the President of PASBAN, whose unwavering dedication and visionary leadership have been the driving force behind this event. Her tireless efforts to champion women in neuroscience have helped build a more inclusive and inspiring scientific community, particularly in Pakistan. Dr. Sadaf's commitment to empowering women neuroscientists is both uplifting and transformative.

My sincere thanks also go to Dr. Saima Gul, the Conference In-Charge, whose meticulous planning and steadfast commitment have ensured the seamless execution of this event. Her organizational expertise has brought together a platform that celebrates the talent, resilience, and potential of women neuroscientists.

I am especially grateful to our esteemed collaborators—IBRO, ALBA Network, WWN, and AEIRC—for their invaluable support in advancing the cause of women in science. Their contributions have played a pivotal role in the success of this conference and in fostering a more inclusive global scientific community.

A special note of appreciation is extended to Shifa Tameer-e-Millat University, our gracious host. Their generosity and support have provided the perfect environment for dialogue, collaboration, and empowerment, making this gathering truly impactful.

This event is not only a celebration of the remarkable achievements of women in neuroscience but also a testament to the power of collaboration and collective effort in driving scientific progress. The leadership and ingenuity of women are not only shaping the field but also redefining its future in groundbreaking ways. Together, we are laying the foundation for a future where women are not only active participants but also leaders in shaping the world of neuroscience.

At PASBAN, we remain steadfast in our commitment to fostering an inclusive environment where every voice is heard, valued, and empowered to shine.

From Lab to Leadership

Women Shaping the Future of Neuroscience



President (Elect)

Dr. Sadaf Ahmed

Pakistan Society of Basic & Applied Neuroscience (PASBAN), Pakistan

It is with immense pride and excitement that I address you as the first woman President of PASBAN, the Pakistan Society of Basic and Applied Neurosciences. Today marks a significant milestone not only for me but for the countless women who aspire to lead in the field of neuroscience.

As we gather for this special event focused on "Leadership in Neuroscience: Challenges and Opportunities", we celebrate the strides we have made as a community while acknowledging the journey ahead. Leadership is not merely about holding positions; it is about inspiring others, creating opportunities, and breaking barriers to pave the way for future generations.

Through my own journey, I have learned that resilience, collaboration, and a clear vision are essential for navigating the complex path from lab benches to boardrooms. This event is a testament to the collective potential of women and men working together to advance brain sciences in Pakistan and beyond.

I invite you to engage, reflect, and take away lessons that empower you to lead with integrity, creativity, and purpose. Let this be a platform for exchanging ideas, fostering mentorship, and building networks that shape the future of neuroscience.

Thank you for your support and for being a part of this transformative journey. Together, we are breaking barriers and building a legacy of impactful leadership.

Conference Chair

Dr. Saima Gul

Associate Professor, Depart. Rehabilitation Sciences, Shifa Tameer-e-Millat University, Islamabad-Pakistan

It is with immense pride and gratitude that I welcome you to the conference "From Lab to Leadership: Women Shaping the Future of Neuroscience." This event represents a journey of passion and collaboration, from its initial conception to its execution, fuelled by a shared vision of advancing women in neuroscience and fostering global inclusivity in science.

I extend my heartfelt thanks to Dr. S. Ather Enam & Dr. Sadaf Ahmed for adopting this initiative under the platform of PASBAN. Their efforts have been pivotal in making this event accessible to women across the globe, ensuring its far-reaching impact. Special gratitude goes to our valued partners—Women in World Neuroscience (WWN), ALBA, the Advance Educational Institute and Research Centre (AEIRC), and most prominently, the International Brain Research Organization (IBRO)—for embracing this idea and taking it forward.

This conference also highlights the inspiring role of young scientists and dedicated volunteers whose passion for promoting science in Pakistan has been invaluable. Their enthusiasm, creativity, and commitment to fostering a vibrant scientific community have contributed immensely to the

From Lab to Leadership

Women Shaping the Future of Neuroscience



success of this event. They exemplify the spirit of innovation and collaboration that drives progress in neuroscience.

This event is built on the belief that diversity and inclusivity are keys to advancing science. By creating opportunities for women and fostering a spirit of collaboration, we aim to inspire future leaders and cultivate innovation in neuroscience.

I am deeply grateful to all the contributors, organizers, sponsors, and participants whose dedication has turned this vision into a reality. May this event serve as a platform for meaningful dialogue, transformative ideas, and enduring inspiration as we celebrate the extraordinary contributions of women shaping the future of neuroscience.

Conference Co-Chair

Prof. Dr. Sagheer Ahmed

Director, ORIC, Shifa Tameer-e-Millat University, Islamabad-Pakistan

As the Director of ORIC and Co-Chair of the conference, I am delighted to welcome you to this transformative event, "From Lab to Leadership: Women Shaping the Future of Neuroscience." This conference celebrates the remarkable contributions of women in neuroscience and aims to inspire future leaders by bridging the gap between research and impactful leadership.

Neuroscience is an ever-evolving field that thrives on innovation, collaboration, and diverse perspectives. Women have been instrumental in advancing groundbreaking research, fostering inclusive communities, and challenging conventional boundaries. This event is not only an opportunity to showcase scientific excellence but also a platform to discuss the challenges and opportunities unique to women in this field.

The insightful abstracts featured in this book reflect the depth and breadth of research being conducted across the neuroscience spectrum. They stand as a testament to the talent, dedication, and vision of researchers who are shaping the future.

I extend my heartfelt gratitude to the organizing committee, our speakers, participants, and supporters for making this conference possible. I hope these discussions will ignite new ideas, collaborations, and pathways for success.

Together, let us continue to pave the way for a more inclusive, innovative, and impactful neuroscience community.

From Lab to Leadership

Women Shaping the Future of Neuroscience



Chief Guest

Prof. Dr. Anila Kamal

Vice-Chancellor, Rawalpindi Women University, Rawalpindi-Pakistan

It is with immense pride and privilege that I extend my heartfelt greetings as the Chief Guest for this groundbreaking conference, "From Lab to Leadership: Women Shaping the Future of Neuroscience."

This event signifies not just an academic convergence but a celebration of the brilliance, resilience, and transformative leadership of women in neuroscience. It is an acknowledgment of their pivotal contributions, from unravelling the mysteries of the human brain in the lab to redefining leadership paradigms across the globe.

In an era where diversity and inclusion are recognized as the bedrock of innovation, this conference stands as a beacon of inspiration. It highlights the power of collaboration and the unique perspectives that women bring to science and leadership. The exchange of ideas and research shared here will undoubtedly propel the field forward and inspire the next generation of neuroscientists.

I commend the organizers for creating this platform and applaud every participant for their dedication to advancing neuroscience. May this conference ignite new ideas, foster meaningful collaborations, and pave the way for even greater achievements.

Advisor

Dr. Shamoon Noushad

General Secretary, Pakistan Society of Basic & Applied Neuroscience (PASBAN)

Associate Professor & Director QEC, Malir University of Science and Technology, Pakistan

On behalf of PASBAN, I am proud to welcome you to the "From Lab to Leadership: Women Shaping the Future of Neuroscience" conference. This event celebrates the pivotal role women play in neuroscience as researchers, leaders, and mentors.

I am particularly inspired by the incredible achievements of our female mentees, who have shown exceptional promise and dedication in their scientific careers. Their success is a testament to the power of mentorship and the importance of creating opportunities for women in STEM. I also extend my deepest gratitude to the women mentors who have guided and empowered the next generation of neuroscientists, helping them navigate the challenges of their fields.

Let this conference remind all aspiring scientists, especially young women, that the journey from lab to leadership is within reach. We can all contribute to a more inclusive and innovative scientific community with curiosity, resilience, and strong mentorship.

Thank you to all the organizers, collaborators, and participants for making this event possible. Let's continue working together to shape a diverse and forward-thinking future for neuroscience.

From Lab to Leadership

Women Shaping the Future of Neuroscience



Advisor

Prof. Dr. Maimoona Siddiqui

Director, Medical Education & SCOPE, SCRC, Consultant Neurologist STMU & SIH, Islamabad -Pakistan

With immense pride and great enthusiasm, I welcome you to the conference “from lab to leadership, Women Shaping the Future of Neuroscience.” This event is a celebration of the remarkable achievements of women in neuroscience and serves as a vibrant platform for exchanging innovative ideas, fostering meaningful collaborations, and inspiring the next generation of scientific pioneers.

As the advisor for this conference, it is an honor to witness the convergence of trailblazing researchers, passionate students, and dedicated professionals, all united in their commitment to unravelling the complexities of the human brain. This gathering is more than just a showcase of scientific excellence; it stands as a testament to the strength, creativity, and resilience that women bring to the forefront of this transformative field. The diverse range of topics presented here underscores the groundbreaking research being conducted across multiple disciplines. I encourage each of you to engage in insightful discussions, build lasting connections, and reflect on the critical role we all play in shaping the future of neuroscience.

Let this conference not only be a celebration of accomplishments but also a call to action—an opportunity to promote equity, inclusion, and mentorship across neuroscience and beyond. Together, we can ensure that the voices of women continue to lead, innovate, and inspire in the world of scientific discovery.

Thank you for your participation, and I eagerly look forward to the wealth of insights and inspiration that this conference promises to deliver.

Advisor

Prof. Dr. Muhammad Tahir Khalily

Dean, Faculty of Social Sciences and Humanities, Shifa Tameer e Millat University, Islamabad -Pakistan

It is my distinct honor and privilege to welcome you to the conference, “From Lab to Leadership: Women Shaping the Future of Neuroscience.” This event represents a profound celebration of the remarkable contributions women have made—and continue to make—in the field of neuroscience, while also serving as a platform to inspire future generations of leaders. In the dynamic world of neuroscience, diversity of thought and experience fuels innovation and discovery. Through the collective wisdom shared during this conference, we aim to bridge the gap between groundbreaking research and influential leadership. By highlighting the achievements of pioneering women in the field, we aspire to create an enduring legacy of empowerment, collaboration, and progress. I extend my heartfelt gratitude to the distinguished speakers, dedicated organizers, and enthusiastic participants who have come together to make this event a success. Your shared commitment to advancing neuroscience and fostering inclusivity is what truly shapes the future of this discipline.

From Lab to Leadership

Women Shaping the Future of Neuroscience



As we engage in insightful discussions and build meaningful connections, let us also renew our dedication to nurturing an environment where everyone—regardless of gender—can thrive and contribute to the forefront of scientific advancement. Thank you for being part of this extraordinary journey.

Advisor

Prof. Dr. Muhammad Tanvir Afzal

Dean, Faculty of Computing, Shifa Tameer e Millat University, Islamabad -Pakistan

As the Advisor of this conference, it is my great honor and privilege to welcome you to this transformative gathering. This conference serves as a platform to celebrate the achievements of women in neuroscience, highlight their groundbreaking contributions, and inspire the next generation of researchers and leaders in the field.

The theme of this event resonates deeply in the dynamic and evolving landscape of neuroscience. It is essential to create inclusive opportunities and foster environments where diverse voices can thrive and innovate. By coming together, we not only share knowledge and ideas but also build supportive networks that propel progress and promote equality. I am thrilled by the wealth of insight and expertise reflected in the abstracts featured in this book. These works symbolize the relentless passion, perseverance, and intellectual curiosity of women and their allies working in neuroscience across the globe. I am confident that the discussions and collaborations born from this event will shape the future of our field in meaningful ways. I extend my heartfelt gratitude to the organizing team, contributors, and participants who have worked tirelessly to make this conference a success. Let us continue to empower, uplift, and inspire one another as we advance the boundaries of neuroscience. Thank you for your participation, and I wish you a productive and inspiring conference experience.

Advisor

Dr. Muhammad Manan Haider

Associate Professor, Dept. Rehabilitation Sciences, Shifa Tameer e Millat University, Islamabad -Pakistan

As the Advisor of this conference, it is my distinct honor to welcome you to this gathering of inspiring minds and trailblazers. This conference serves as a platform to celebrate the remarkable contributions of women in neuroscience, showcase innovative research, and foster meaningful discussions on leadership and equity in our field. The journey from lab to leadership is filled with challenges, breakthroughs, and transformative moments. It is vital to recognize and amplify the voices of women who have not only advanced the science of the brain but also paved the way for future generations of neuroscientists. This event brings together a diverse community to share knowledge, empower one another, and spark collaborations that will shape the future of neuroscience. I extend my heartfelt thanks to the organizers, participants, and supporters for making this event possible. May this conference inspire us all to champion diversity, innovation, and leadership as we collectively advance the frontiers of neuroscience. Thank you for being a part of this momentous occasion.



Plenary Talk

Creating Opportunities: How Diversity and Inclusivity Drive Innovation in Neuroscience

Prof. Dr. Sohail A Qureshi

Director of Research & Innovation, Shalamar Institute of Health Sciences, Lahore-Pakistan
Executive Member, Pakistan Society of Basic and Applied Sciences (PASBAN), Pakistan

In Pakistan, the journey of women in education and professional life remains fraught with challenges. Despite a growing focus on education, only 44% of girls are enrolled in primary school, and the percentage drops significantly as they progress to higher education. Even in universities where female enrollment often surpasses that of males in certain disciplines, the transition to professional practice or leadership roles remains minimal. Data reveals that less than 25% of women with higher education degrees enter the workforce, and an even smaller percentage rise to leadership positions. This disparity reflects deeply ingrained societal, cultural, and institutional barriers that women must overcome to succeed. In neuroscience, as in other scientific domains, Pakistani women have proven their potential despite these obstacles. Those who have made a mark in laboratories, classrooms, boardrooms, or leadership roles have done so by breaking through systemic barriers, defying societal expectations, and thriving in an environment that often offers little support. Their success stories are a testament to the critical role of diversity and inclusivity, which not only allow women to flourish but also enrich the scientific community with varied perspectives, innovative ideas, and collaborative approaches. Research shows that diverse teams outperform homogeneous ones, and inclusivity drives better decision-making and productivity. This plenary talk emphasizes the importance of creating equitable opportunities for women and fostering environments that celebrate differences, whether in gender, ethnicity, or diversity. Drawing on global and local examples, it highlights how diversity and inclusivity have transformed neuroscience and STEM fields, leading to groundbreaking discoveries and equitable representation. The talk also presents actionable strategies to address barriers faced by women in neuroscience, such as mentorship programs, gender-sensitive policies, and inclusive research spaces.

From Lab to Leadership

Women Shaping the Future of Neuroscience



Thematic Talk

From Lab to Leadership: A Journey of Resilience, Advocacy, and Inclusivity in Neuroscience

Dr. Sadaf Ahmed

Psychophysiology Research Lab, University of Karachi, Pakistan | CEO, Advance Educational Institute & Research center (AEIRC), Karachi-Pakistan | President (Elect) – Pakistan Society of Basic & Applied Neuroscience (PASBAN), Pakistan | Executive Member, World Women in Neuroscience

In this personal journey, I share my experiences as a woman neuroscientist in Pakistan, steering the complex path from working in the lab to taking on leadership roles in neuroscience. My journey has been shaped by overcoming significant challenges, including societal and institutional barriers and gender bias in a male-dominated field. Starting in the lab, I developed a deep passion for neuroscience and research, but I soon recognized the need for advocacy and the importance of translating research into real-world impact. As I progressed in my career, I moved beyond the lab to engage in advocacy efforts aimed at raising awareness about neuroscience and mental health in Pakistan, working to bridge the gap between scientific research and the wider community. In my academic role, I have strived to foster an inclusive environment for students and built Pakistan's first Psychophysiology research lab at University of Karachi, providing mentorship and guidance, and helping them direct the complexities of neuroscience. I also led PASBAN, where I created platforms for collaboration, research, and gender inclusivity in the neuroscience community. My work at AEIRC has further allowed me to drive initiatives that support educational development, innovation, and community health. Leading these efforts has reinforced my belief in the power of science to improve lives, particularly in underserved communities. Throughout this journey, I have also embraced my neurodivergent identity, using it as a source of strength to push for greater inclusivity in both academic and community settings. This experience has shaped my approach to leadership, advocating for the empowerment of neurodivergent individuals and women in neuroscience. From my lab work to my advocacy, from supporting students in academic settings to leading community health initiatives, my journey is a testament to resilience, the importance of mentorship, and the transformative power of diversity. I hope to inspire women and neurodivergent individuals who aspire to lead in neuroscience, encouraging them to pursue their passions and contribute to a more inclusive and equitable scientific community.

“In every challenge lies an opportunity to break barriers and shape the future for those who follow.”



Panel Discussion

Panel Session 1

Breaking Barriers in Neuroscience Leadership

The panel "Breaking Barriers in Neuroscience Leadership" delves into the multifaceted challenges and opportunities in advancing leadership roles in neuroscience, particularly for underrepresented groups. With an emphasis on diversity, equity, and inclusion, this discussion examines the systemic barriers that hinder access to education, mentorship, and leadership opportunities, particularly for women and marginalized communities in Pakistan. Panelists, including accomplished neuroscientists and policymakers, will share their journeys, insights, and actionable strategies to foster an environment that encourages innovation and excellence in neuroscience leadership. This dialogue aims to inspire young scientists and highlight the critical role of inclusive leadership in shaping the future of neuroscience.

Panel Session 2

Mentorship and Support Networks for Female Neuroscientists

The panel "Mentorship and Support Networks for Female Neuroscientists" explores the transformative role of mentorship and community-building in empowering women to excel in neuroscience. With a focus on bridging the gender gap, the discussion emphasizes creating robust support networks that address the unique challenges faced by female neuroscientists, from early education to leadership roles. Panelists, including esteemed neuroscientists, educators, and advocates, will share experiences and strategies for fostering mentorship, collaboration, and solidarity. The panel aims to inspire actionable initiatives to nurture the next generation of female neuroscientists and create a sustainable ecosystem of support within the neuroscience community.



Oral Presentations

Diversity and Inclusion: The Essential Psychological Benefits of Gender-Equitable Laboratories

Rizwana Amin

Effat University Jeddah-Saudi Arabia

Diversity and inclusion are essential for fostering innovation and success in neuroscience research. Gender-equitable laboratories create an environment where diverse perspectives and talents can thrive, resulting in enhanced creativity, collaboration, and problem-solving. This paper examines the psychological benefits of gender-equitable labs, emphasizing how inclusivity enhances individual and collective well-being. Gender diversity fosters psychological safety, promoting open communication and minimizing the fear of judgment or exclusion. Inclusive nurturing environments foster cognitive flexibility, which is vital for scientific innovation. When individuals feel empowered to express their unconventional ideas and challenge the status quo, it creates a supportive space where creativity can thrive. It's important to embrace diverse perspectives, as they can lead us to remarkable discoveries together.

The presence of equitable practices in research teams is linked to increased job satisfaction, motivation, and professional fulfillment for both women and men. This also highlights the importance of systemic change to tackle unconscious biases and to implement policies that promote equity. It emphasizes that fostering diversity and inclusion is not only an ethical responsibility but also provides psychological benefits that can accelerate scientific breakthroughs and create healthier, more dynamic work environments.

Platform for Women in Neuroscience

Rukhsana Nawaz

Department of Clinical Psychology, College of Medicines and Health Sciences,
United Arab Emirates University, Al Ain, UAE

Across the world, spectacular increased in diverse approach to scientific research and progress in neuroscience through cellular and molecular mechanism study in last few decades. Though, the innovative work of women scientists is still unrecognized and unacknowledged because fewer women are in leadership positions and less or limited federal grant awards and scholarships. Women who contribute in neuroscience deserve more recognition and support.

From Lab to Leadership

Women Shaping the Future of Neuroscience



In this talk, we will discuss women challenges to attaining success in mentoring experience and in innovative scientific work in the field of neuroscience. How to prevail over their fear of asking for help in academic talent and need guidance, encouragement and advise to face difficulties to achieve success in their career. Our main focus is on successful women neuroscientists insight significant impacts in neuroscience and the positive influence of their work on advancing society and culture. The purpose of our talk to maintain positivity environment for women's work come up with encouragement and contribution and also provide them different forums to give praise and benefit within the field as a leaders and mentors. In future, these women will be as enthusiastic and resourceful in your turn to direct young women seeking counsel in neuroscience field of study.

From Challenges to Triumphs: Women Shaping the Future of Neuroscience

Farina Hanif

Dow University of Health Sciences, Karachi-Pakistan

Women have made remarkable strides in neuroscience, yet gender disparities persist, limiting their full potential to shape the future of this dynamic field. This presentation explores my journey from a researcher to a leadership role in molecular medicine and neuroscience, reflecting on challenges faced and lessons learned as a woman in science. By drawing on examples of pioneering women neuroscientists, I will discuss the progress made and the barriers that remain in achieving gender equity in STEM.

The talk will highlight emerging trends in neuroscience, such as neurogenomics, artificial intelligence applications, and brain-machine interfaces, emphasizing the vast opportunities for young researchers to contribute to transformative discoveries. Special focus will be given to empowering women through mentorship programs, leadership initiatives, and scholarships designed to address gender disparities in STEM fields.

By fostering inclusion and building supportive networks, the next generation of neuroscientists can drive innovation while ensuring diversity in research and leadership. This presentation seeks to inspire and equip attendees, particularly women, with actionable insights to overcome challenges, embrace opportunities, and contribute meaningfully to the future of neuroscience.



Poster Presentations

Balance performance of young adults with cognitive and physical load under multi-task conditions

Esha Khan, Iqra Rauf, Hira Mashal, Tuba Arshad, Mahnoor Alam, & Aleysa Zeb

Department of Rehabilitation Sciences, Shifa Tameer-e- Millat University, Islamabad-Pakistan

Young adults sometimes find themselves juggling many responsibilities at once in today's fast-paced and demanding culture. Maintaining equilibrium while multitasking, a person's performance may be impacted and their chance of accidents or mistakes may increase. The aim of this study is to observe the effects of cognitive and physical load on dynamic and static balance of young healthy adults while performing multi-task activities, conducted in Islamabad/Rawalpindi, Pakistan, with 377 university students (aged 19-25) through Non-probability convenient sampling, the study excluded participants with certain health conditions. Dynamic balance was assessed using the Y-Balance Test, and static balance using the Single Leg Stance Test, under normal and multi-task conditions (cognitive tasks and carrying weights of 3kg/5kg). The correlation analysis revealed significant differences in static balance performance ($p < .001$) between tasks using the Single Leg Stance Test (SLST) with and without cognitive and physical loads. For the SLST with eyes open, mean durations were 40.3 seconds (SLSTCL+3KG), 38.36 seconds (SLSTCL+5KG), and 51.42 seconds (no load), indicating that added loads reduced balance performance. For the SLST with eyes closed, mean durations were 5.69 seconds (SLSTCL+3KG), 5.63 seconds (SLSTCL+5KG), and 5.58 seconds (no load), showing a slight improvement with added loads. The correlation analysis revealed significant differences in Y-Balance Test performance across tasks ($p < .001$). Under normal conditions, the average scores were 81.89 cm for the right leg and 80.46 cm for the left leg. With cognitive load (YBTCL+3KG), scores decreased to 80.73 cm (right leg) and 78.69 cm (left leg). With higher physical load (YBTCL+5KG), scores further decreased to 79.58 cm (right leg) and 77.87 cm (left leg). These findings indicate that under multi-task conditions, simultaneous cognitive and physical load decreased the dynamic balance performance and in case of static balance performance, cognitive and physical loads decreased balance with eyes open but had little effect with eyes closed.

From Lab to Leadership

Women Shaping the Future of Neuroscience



Building Resilience: Women on field Tackling Mental Health Crises

Ujala Sajid, S. Farah Batool, & Neha Amber

¹Malir University of Science and Technology, Karachi-Pakistan

²Psychophysiology Research Lab, University of Karachi, Karachi-Pakistan

Working women often face unique challenges in balancing professional responsibilities and personal obligations, particularly in low- and middle-income settings. These stressors can significantly impact their mental health, necessitating targeted interventions to build resilience. Understanding the specific challenges faced by women in such environments can inform strategies to mitigate stress and enhance well-being. This study aimed to evaluate the mental health challenges faced by working women at Koohi Goth Women's Hospital and Malir University of Science and Technology. It also explored the coping mechanisms they employ to build resilience against daily stressors.

A cross-sectional study was conducted among 150 working women aged 25 to 50 years from Koohi Goth Women's Hospital and Malir University. Data were collected using a validated tool, the Perceived Stress Scale (PSS), alongside the Sadaf Stress Scale (SSS), to assess mental stress levels. Participants completed a self-administered questionnaire, which included demographic information, work-related challenges, and coping strategies. Descriptive and inferential statistical analyses were performed to evaluate stress levels and associated factors.

The findings revealed that 68% of participants experienced moderate to high levels of stress, with the highest stressors identified as workload (45%), family pressures (30%), and workplace conflicts (25%). Women reported coping strategies such as mindfulness practices (40%), seeking social support (35%), and engaging in physical activities (25%). The Sadaf Stress Scale effectively quantified stress levels, with a mean score indicating moderate stress overall. Women with access to institutional support services reported lower stress levels compared to those without.

This study highlights the significant mental health challenges faced by working women in healthcare and education sectors. Targeted interventions, including workplace counseling, stress management programs, and institutional support, are critical in fostering resilience among women professionals. The findings emphasize the need for organizations to address mental health proactively, ensuring sustainable productivity and well-being for women in the workforce.

Holistic Examination of Women's Experiences in Academia

Sadaf Ahmed¹, Ujala Sajid^{1,2}, & Shamoon Noushad²

¹Psychophysiology Research Lab, University of Karachi, Karachi-Pakistan

²Malir University of Science and Technology, Karachi-Pakistan

his study investigates persistent gender disparities and challenges faced by women in academia, focusing on harassment, intersectionality, and the leaky pipeline. Employing mixed methods, it reveals varied prevalence of harassment types and identifies institutional support gaps. Thematic analysis uncovers emotional tolls, coping mechanisms, and the role of institutional culture, while correlation analysis highlights

From Lab to Leadership

Women Shaping the Future of Neuroscience



positive relationships between support and career progression. Recommendations include implementing clear reporting mechanisms and diversity training. The study emphasizes the need for ongoing research to assess the effectiveness of interventions. In conclusion, targeted strategies are crucial for creating an equitable and supportive academic environment.

Empowering Women; basic right for being an Individual

Ujala Sajid^{1,2}, S. Faiza Batool², & Hira Qaisar³

¹Malir University of Science and Technology, Karachi-Pakistan

²Psychophysiology Research Lab, University of Karachi, Karachi-Pakistan

³St John of God healthcare Murdoch, Australia

Concept Women empowerment emerge from the middle of 20th century and now recognize globally. Empower the women from discrimination, inequality and injustice are the basic aspects of this approach. Gender equality, economic empowerment, social empowerment, political empowerment and education are all the integral of women empowerment which provide the safe space where they have rights for education, equal opportunities in social, economic and political status.

To investigate the gaps between the knowledge of empowering women and to found the real struggle of women on daily basis we applied both the quantitative and qualitative data collection procedure, which include the questionnaire with close-ended question and the interviews with selected women from different region.

Women with different background have different approaches and their empowerment vary according to it even though culture and social bounding's hinder the pathway of empowerment. But it has been noted that the education and training sessions are helpful in bringing change in one's narrative and behavior. Empowering the women; it's not only the concept of girls education right, it also about their social, political and economic stability.

Being human beings, women should also be treated as equals. With the growing world and interest of people in women's empowerment, it became the central aspect of each country's policies. We apply a mix-method research approach to address women's empowerment and the gaps in its knowledge, which include a questionnaire and interviews of the selected women. Hence our study suggests that training programs in different areas increase awareness and empowerment of women; however, societal and cultural barriers are the prominent hindrance associated with women's empowerment.

Gender Representation in Global Neuroscience Conferences (2014–2023): Trends, Challenges, and the Inclusion of Pakistani Women

Yusra Saleem; Amaila Fazal & Ramsha Alam

Malir University of Science & Technology

The field of neuroscience, like many other scientific disciplines, has traditionally been dominated by male researchers. Over recent years, however, there has been a concerted effort to increase female representation across various roles in international neuroscience

From Lab to Leadership

Women Shaping the Future of Neuroscience



conferences and events. This study focuses on gender representation in key roles within major neuroscience conferences, with a particular focus on the challenges and opportunities faced by Pakistani women in neuroscience.

The aim of this study was to analyze the gender representation of female and male neuroscientists in keynote and symposium roles, poster presentations, and organizing committees across three time periods (2014-2016, 2017-2019, and 2020-2023). The study also explores the barriers that Pakistani women in neuroscience face and the strategies they employ to overcome these challenges. A mixed-methods approach was used. Quantitative data were gathered from reports on the SfN, FENS, IBRO, and regional conferences, covering female and male participation in various roles. The data were analyzed using descriptive statistics, and chi-square tests were applied to identify significant changes over time. Additionally, qualitative interviews with Pakistani women neuroscientists were conducted to explore personal challenges and strategies for overcoming barriers, with a focus on themes such as funding, visibility, institutional support, cultural and societal barriers, and networking. The study shows that while female representation in neuroscience conferences has increased over time, men still dominate key roles. Female participation in keynote speeches, symposiums, poster presentations, and organizing committees has risen from 2014 to 2023, but men consistently held the majority. Chi-square tests revealed statistically significant increases in female representation, especially in the period from 2020-2023. However, women still face challenges like insufficient funding, cultural expectations, and lack of institutional support. Despite these barriers, women have found ways to overcome them, including crowdfunding, mentorship networks, and international collaborations, yet the gender gap remains substantial in leadership and prominent roles. While female representation in neuroscience conferences has increased from 2014 to 2023, men still dominate key roles, including keynote speakers and organizing committees. Despite growth in female participation, barriers like funding limitations, cultural pressures, and lack of institutional support persist. Women have managed to overcome some challenges through crowdfunding, mentorship networks, and international collaborations. Continued efforts are necessary to ensure more equitable representation, especially in leadership roles.

Breaking Barriers: Challenges Faced by Women in Brain and Mind Sciences in Pakistan

Sadaf Ahmed^{1,2}, & Shamoon Noushad^{1,3}

¹Pakistan Society of Basic & Applied Neurosciences-Pakistan

²University of Karachi, Karachi-Pakistan

³Malir University of Science and Technology, Karachi-Pakistan

This study explores the challenges faced by women in brain and mind sciences in Pakistan through a mixed-method approach involving 15 professionals from urban and semi-urban areas. Key issues identified include gender bias, lack of mentorship, limited funding, work-life balance struggles, and safety concerns, exacerbated by cultural norms and institutional gaps. Addressing these barriers requires reforms such as family-friendly policies,

From Lab to Leadership

Women Shaping the Future of Neuroscience



targeted funding, mentorship pro-grams, and public aware-ness campaigns to foster gender equity and em-power women scientists. The study employed a mixed-method approach, combining qualitative and quantitative methodologies to explore the challenges faced by women in brain and mind sciences in Paki-stan. Fifteen participants, aged 25–50, were purposively selected from teaching, research, and ad-vocacy roles in neuroscience, psy-chology, and mental health, rep-resenting both urban and semi-urban areas. Data collection in-volved a semi-structured focus group discussion (FGD) to gather qualitative insights and a ques-tionnaire featuring closed- and open-ended questions to capture both qualitative and quantitative data. Thematic analysis was used to identify recurring themes in the qualitative data, while de-scriptive statistics quantified the prevalence of specific challenges reported in the survey.

The journey of women in brain and mind sciences in Pakistan is one of resilience against formidable odds. While cultural norms, gender bias, and structural challenges persist, their collective determination to ad-vance science and improve societal well-being is inspiring.

Brains in Overdrive: Women Neuroscientists Tackling Challenges with Multitasking Superpower

Sadaf Ahmed^{1,2}, & Shamoon Noushad^{1,3}

¹Pakistan Society of Basic & Applied Neurosciences-Pakistan

²University of Karachi, Karachi-Pakistan

³Malir University of Science and Technology, Karachi-Pakistan

Women neuroscientists operate in high-stakes environments, where their multitasking abili-ties must shine. Balanc-ing research, teaching, mentorship, and personal responsibilities, their brains demonstrate in-credible resilience and adaptability. This poster explores the challenges, barriers, and "superpowers" of a wom-an's multitasking brain, celebrating the neural brilliance and societal contributions of women in neuroscience. The multitasking abilities of women are rooted in extraor-dinary brain functions that enable them to adapt and ex-cel across various roles. Their neuroplasticity allows them to seamlessly transition between professional and personal tasks, continuously adjusting to shifting priorities. En-hanced emotional intelligence, driven by the amygdala and prefrontal cortex, equips women to manage stress effec-tively while nurturing strong relationships with colleagues, students, and family. The multitasking brain of a woman neuroscientist is an evidence to her superpowers of adaptability, emotional intelli-gence, and innovation. Despite societal and professional challenges, her contributions are reshaping the landscape of science, proving that women's multitasking brains are not just capable—they are EXTRAORDINARY.

From Lab to Leadership

Women Shaping the Future of Neuroscience



Resilient Minds, Compassionate Leaders: Women Redefining Neurodivergence

Sadaf Ahmed^{1,2}, & Mryam Ali^{3,4}

¹Pakistan Society of Basic & Applied Neurosciences-Pakistan

²University of Karachi, Psychophysiology Research Lab, Karachi-Pakistan

³The University of Toronto, Graduate Department of Psychology & Collaborative Specialization in Neuroscience, Canada

⁴The Hospital for Sick Children Research Institute, Neuroscience Mental Health, Canada

Neurodivergent women are redefining leadership with their unique cognitive and emotional strengths. Their heightened sensory awareness, emotional depth, creative problem-solving abilities, and exceptional memory make them resilient leaders. These qualities enable them to process complex information, empathize deeply, and lead with innovative perspectives. However, they face significant challenges, including sensory overload, emotional exhaustion, societal misconceptions, and vulnerability to manipulation. These barriers often compel them to navigate environments that require constant self-advocacy and emotional regulation.

The poster emphasizes how neurodivergent women overcome these challenges with extraordinary grace, compassion, and authenticity. It also sheds light on their ability to foster inclusive environments, inspire adaptability, and lead by example, showcasing the potential for neurodivergent individuals to excel as role models in diverse fields. Through awareness and understanding, society can empower neurodivergent women to achieve their full potential and redefine traditional leadership paradigms.

Bringing babies to workplace; balancing or misbalancing lives?

Syeda Faiza Batool & Syeda Farah Batool

Malir University of Science and Technology, Karachi-Pakistan

Achieving a harmonious equilibrium between work and family obligations poses a considerable test, particularly for women, especially those with infants or babies. Female employees and educators who opt to bring their young children to the workplace confront distinct challenges that can significantly influence their efficiency and well-being. Working mothers face unique challenges that can affect their productivity and well-being. A study found that female teachers who brought their infants or babies to work experienced emotional exhaustion and low job satisfaction due to the lack of support from colleagues and superiors. Another study found that working mothers who experienced social stigma in the workplace reported higher levels of work-family conflict. The study involved quantitative surveys and qualitative interviews.

This study is geared towards recognizing the hurdles encountered by female staff and teachers who choose to bring their infants or babies to their workplaces. Additionally, the study seeks to propose viable solutions for surmounting these challenges. Employing a mixed-methods approach, data was gathered from a cohort of 50 female staff and teachers who were actively bringing their infants or babies to work. This comprehensive strategy involved quantitative surveys and qualitative interviews. The transcribed

From Lab to Leadership

Women Shaping the Future of Neuroscience



interviews were carefully reviewed and cod-ed to identify recurring themes, patterns, and categories related to the solutions proposed by the participants. This involved a process of coding the data, identifying key concepts, and organizing them into meaningful themes. The research outcomes underscore a range of challenges that working mothers face when integrating their parental responsibilities with professional commitments. These obstacles encompass inadequate support systems, an unsuitable work environment for child care, and the prevalence of social stigmatization. The study underscores the significance of implementing adaptive solutions, including flexible work arrangements, robust workplace policies accommodating child care, and fostering social support networks.

Prevalence of fibromyalgia in internal wards patients in Rawalpindi and Islamabad

Arooba Azhar Abbasi

Shifa Tameer -e- Millat University, Islamabad-Pakistan

Fibromyalgia most commonly effects the female those are housewives. Present study helped to find out the prevalence of Fibromyalgia in Internal Wards Patients in Rawalpindi and Islamabad. To find out the prevalence of fibromyalgia in internal ward patients in Rawalpindi and Islamabad. To find out the gender difference in development of fibromyalgia in internal wards patients in Rawalpindi and Islamabad. To find out the age difference in development of fibromyalgia in internal wards patients in Rawalpindi and Islamabad. To find out the association of inactivity and poor health condition with the development of fibromyalgia. The study design was a descriptive study with the sample size of 347. Study was conducted in Rawalpindi Islamabad.

A total of n=347 adults of any age were included in study. The age group that was prominent to have Fibromyalgia of the respondents was found to be 20 years and older in female and middle age to older in males, n=84 (24.2%). The women are more prone to Fibromyalgia in Rawalpindi and Islamabad than men. The study shows that the frequency of pain is severe in most of the participants. Further the table discusses frequency of symptoms, age difference, gender difference and causes of hospitalization .

The present study conclude that women are more prone to have fibromyalgia in Rawalpindi and Islamabad patients than men. The study shows that the frequency of pain is severe in middle aged to older participants. Depression, Headache and Fatigue are more common symptoms that are associated with the condition as well as these pain in different body regions in internal wards patients of Rawalpindi and Islamabad.



Hematological and Biochemical Changes in Bacterial Meningitis Patients with Antimicrobial Resistance

Syeda Ayesha Ali

Sardar Bahadur Khan Women's University, Quetta-Pakistan

Bacterial meningitis (BM) is a life-threatening infection causing inflammation of the brain's meninges. Untreated, it can lead to permanent neurological disabilities or death, imposing significant social and economic burdens. This cross-sectional study investigated total blood count, C-reactive protein (CRP), and clinical characteristics to predict BM infection in patients admitted to Government Hospitals, Quetta. Our study revealed a prevalence of 35.9% for confirmed BM cases among the population of Quetta, Balochistan. The bacterial isolates identified in this study included *Streptococcus pneumoniae*, *Neisseria meningitidis*, *Haemophilus influenzae*, *Escherichia coli*, and *Klebsiella pneumoniae*. The higher BM incidence rate recorded among males than females. Extreme age groups such as infants and elderly adults with weakened immunity were particularly vulnerable to severe BM.

The majority of BM patients had elevated CRP levels, platelets, total leukocytes, neutrophils, lymphocytes, and monocytes counts. Disparities in serum electrolytes were also recorded. BM patients presented with abnormal CSF appearance, pleocytosis, elevated CSF protein, low CSF glucose, leukocytosis, fever, headache, and nuchal rigidity. Antibiotic resistance was rampant, as all isolated pathogens demonstrated significant resistance to first-generation antibiotics. The elevated case fatality rate underscores the threat of antimicrobial resistance in BM isolates from the population of Balochistan. The study emphasizes the imperative need for concern about the increasing incidence of BM in the region, stressing the importance of precise diagnosis and effective treatment. The current study's findings can shape public health policies and strategies to combat BM and enhance patient outcomes in this region.

Exploring Proteomic Alterations in Intellectual Disability: Insights from Hyperlipidemia and Hyperphosphatasia Subgroups

Soma Vankwani¹, Munazza Raza Mirza¹, Fazli Rabbi Awan², Arkadiusz Nawrocki³, Martin Rossel Larsen³, & Muhammad Iqbal Choudhary¹

¹Dr. Panjwani Center for Molecular Medicine and Drug Research, International Center for Chemical and Biological Sciences (ICCBS), University of Karachi, Karachi-Pakistan

²Health Biotechnology Division, National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan

³Department of Biochemistry and Molecular Biology, University of Southern Denmark, Odense, Denmark.

A significant increase of neurodevelopment disorders (NDDs) among children presents growing healthcare challenge worldwide. Owing to heterogenic, multifactorial nature of NDDs, finding effective biomarkers for the early detection and intervention of NDDs has become extremely complex. This study aims to investigate the molecular mechanisms of NDDs, focusing on the associations between hyperphosphatasia (HPP) and hyperlipidemia (HLD) in the patients with intellectual disability (ID).

From Lab to Leadership

Women Shaping the Future of Neuroscience



Blood samples from 800 study participants (ID patients and healthy individuals HC) were analyzed for the biochemical differences. Among them, 105 ID patients with uniquely altered biochemical profiles (ID-HPP, n=28, HLD, n=77) and 65 HC samples were further investigated for proteomic analysis. A total of 354 proteins were identified in label free quantitative proteomic analysis. The ID HPP and ID-HLD groups each had distinct protein profiles compared to HC, with 28 and 85 differentially expressed proteins, respectively. The ID-HLD group had 66 unique proteins, whereas ID-HPP had 9 unique proteins, with 19 proteins common among ID subtypes. Pathway analysis revealed shared pathways like the complement system and lipoprotein metabolism disruptions, but distinct pathway disturbances: toll-like receptor and integrin signaling in ID-HPP, and hemostatic pathways in ID-HLD. These findings elucidate systemic pathway abnormalities in NDDs including ID.

Comparison of Robotic/Traditional Mirror Therapy in Motor Recovery of Hand in Chronic Stroke Patients: A Randomized Controlled Trial

Salma Abbas¹, Mudassar Rooh-ul-Muazzam¹, Fouzia Batool², & Saima Gul²

¹Athlean Physical Therapy Clinic, Islamabad-Pakistan

²Department of Rehabilitation Sciences, Shifa Tameer -e- Millat University, Islamabad-Pakistan

This study aimed to compare the effects of robotic mirror therapy and traditional mirror therapy on motor recovery of the hand in chronic stroke patients. A single-blinded, parallel, prospective, randomized controlled trial was conducted over 6 months at Athlean Physical Therapy, Islamabad, from April 2022 to September 2022, enrolling 34 participants with a mean age of 62.38 ± 9.16 years. Participants met the following inclusion criteria: age 40-85 years, right hemispheric ischemic or hemorrhagic stroke, stroke incident at least 6 months ago, Upper Extremity (U.E.) Fugl-Meyer score between 34-62, and U.E. Box and Block Test score between 0 and 55. The participants were randomly assigned to two groups: Group A (n=17) received robotic mirror therapy along with conventional therapy, and Group B (n=17) received traditional mirror therapy along with conventional therapy. Both interventions were administered for 30 minutes per day (3 sets, 12-15 repetitions), three times a week for six consecutive weeks. The Box and Block Test, Motor Assessment Scale, and Upper Limb Fugl-Meyer Assessment were used as outcome measures before and after treatment. Between-group analysis showed that the robotic mirror therapy group had significantly higher results in motor hand recovery compared to the traditional mirror therapy group across all outcome measures ($p \leq 0.05$). Within-group analysis indicated significant improvements in both groups on all outcome measures ($p < 0.05$). The study concluded that robotic mirror therapy is more effective than traditional mirror therapy in promoting hand function recovery in chronic stroke patients.

From Lab to Leadership

Women Shaping the Future of Neuroscience



Current Knowledge, Attitudes, and Perceptions of Hyperbaric Oxygen Therapy (HBOT) among Medical Practitioners, Trainers and Athletes

Hira Sakhawat, Hamna Khurram, Hiba Nasir, & Badur-un-Nisa

Department of Rehabilitation Sciences, Shifa Tameer-e- Millat University, Islamabad-Pakistan

Hyperbaric oxygen therapy (HBOT) is a treatment modality being used by medical practitioners, and athletes for years, and has significantly evolved in both research and application. Its beneficial effects are increasingly being utilized. It is scarcely available in Pakistan. This study is an attempt to assess knowledge, attitudes and perceptions (KAP) among doctors, therapists, biomedical engineers, trainers and athletes regarding HBO. The objective of our study is to assess current knowledge, attitude, and perception of HBOT among healthcare professionals in Pakistan and to gain insights into the awareness and acceptance levels of HBOT. This study aims to fill existing gaps in literature and identify the barriers and facilitators in the application of HBOT. A cross-sectional survey with 315 healthcare practitioners by using a self-structured questionnaire, developed with prior published literature from tertiary healthcare setting. Data was analyzed using SPSS software. Scores were determined using standardized scales and Pearson's Chi-Square tests were performed to assess associations between categorical variables.

Mean age of the participants was 29.16 ± 4.81 years. Participants reported 10.3%, 89.4% and 0.3% with good, average and poor knowledge about HBOT. A positive attitude was reported by 46% of participants, 54% showed a neutral attitude. A positive perception towards HBOT was found in 11.9% participants, while 88.1% participants had neutral perception. A significant association of KAP was found with Gender Occupation and Working Area of participants. A large number of participants had average knowledge but not many had received training or education, a large number also showed a positive attitude towards HBOT. There is a general lack of awareness about the existence of HBOT in Pakistan.

Translation And Cross-Cultural Adaptation of Sydney Swallow Questionnaire in Urdu and Its Psychometric Properties Among Post Stroke Dysphagia Patient

Syeda Amna Ejaz¹, Rania Imran², Hadia Furqan³, & Anam Jamil³

¹Toddlers Spectrum House, Islamabad-Pakistan

²Primal Support Rehabilitation Center, Islamabad-Pakistan

³Shifa Tameer-e-Millat University, Islamabad-Pakistan

Sydney Swallow Questionnaire is being used in its original version, English and has been translated into different languages for different clinical and research purposes except in Urdu. The purpose of the study was translation and cross-cultural adaptation of Sydney Swallow Questionnaire in Urdu (SSQ-U) followed by evaluation of its psychometric properties among post-stroke Dysphagia patients. Sydney Swallow Questionnaire was translated following the World Health Organization (WHO) guidelines for Translation and Adaptation. Comprehension level assessed through cognitive interviews and focused

From Lab to Leadership

Women Shaping the Future of Neuroscience



group discussions among Urdu language speaker clinicians. The initial pilot testing of the pre-final version depicts understanding and acceptability of SSQ-U which was administered to 61 patients of post stroke Dysphagia after meeting the inclusion criteria of the study. Cronbach's Alpha reliability of translated Urdu version of Sydney Swallow Questionnaire was 0.941 with the p value of 0.000. Test-retest and inter-rater reliability of SSQU demonstrated significant reliability with the Intra-class correlation coefficient score of 0.985 and Cronbach's Alpha value of 0.993 respectively. Content validity of SSQ-U shows Content Validity Index of 0.862 and Scale Content Validity Index of 0.8. The Urdu adaptation of Sydney Swallow Questionnaire proved to be valid and reliable to evaluate post stroke Dysphagia patients and is viable for academic, clinical and research purposes.

Prevalence of Voice Disorders in Primary School Teachers of Islamabad and Rawalpindi

Hadia Binte Obaid¹, Mishaal Arif², Anam Jamil³, & Hina Wajahat⁴

¹Umeed-e-Saad Rehabilitation Centre, Islamabad-Pakistan

²Karachi Down Syndrome Club, Islamabad-Pakistan

³Shifa Tameer-e-Millat University, Islamabad-Pakistan

⁴Riphah International University, Islamabad-Pakistan

Voice acts as a tool of work for those professionals who depend on voice-use for their task completion. Their job depends on their voice thus causing a negative impact on their voice quality. Vocal hygiene is therefore considered as a primary aspect of concern for these professionals. To assess the prevalence of voice disorders among primary school teachers of Pakistan, a cross-sectional study was conducted after getting prior permission. The data was collected from 377 teachers of private and government schools of Islamabad and Rawalpindi. Those teachers who were under the age range of 25-50 years and with the working experience of more than one year were included in the study. Voice quality of these teachers was assessed using valid and reliable Voice Handicap Index-10 after getting written consent from them. Three subscales of VHI-10 helped assessing the functional, physical and emotional damages of voice abuse. The results revealed that a large number of teachers experienced voice disorders i.e., 15.9% teachers were having mild, 51.5% moderate, and 32.6% severe voice disorders. Whereas, 21.22% females were facing severe voice problems as compared to males i.e., 15.11%. This research highlights that a considerable number of teachers suffer from voice issues, mostly of moderate severity. Also, females face more severe voice problems as compared to males. The findings of the study will enable the policymakers to devise a vocal hygiene regime for these professionals to address this issue at public level.

From Lab to Leadership

Women Shaping the Future of Neuroscience



Knowledge and Attitude Regarding Autism Spectrum Disorder Among Healthcare Professionals in Rawalpindi and Islamabad

Humna Bano¹, Jawaria Jarra², & Saima Gul³

¹Shifa International Hospital, Islamabad-Pakistan

²Alckemy Aesthetics, Kotli-Pakistan

³Shifa Tameer-e-Millat University, Islamabad-Pakistan

The study evaluated knowledge of childhood autism spectrum disorder (ASD) among 290 healthcare professionals in Rawalpindi and Islamabad from January to June 2023. Participants were males and females aged 24 to 70 that were recruited via a convenient (non-probability) sampling technique. The Knowledge about Childhood Autism among Health Workers (KCAHW) questionnaire was used, and data was analyzed using SPSS-21. The study identified significant autism-related impairments, including challenges in social interaction, communication delays, and obsessive-compulsive behaviors. Participants displayed varying levels of knowledge and beliefs about autism. The mean scores for the four questionnaire domains were 5.8, 7.8, 2.8, and 2.4, respectively, indicating the extent of these impairments. The mean total score of 11.96 highlighted the need for improved education and support in addressing autism-related challenges. Among 290 healthcare professionals, 41.72% were male and 58.28% were female with mean age of 33.32 ± 8.2 . The total mean score in the KCAHW questionnaire was 11.96 ± 3.47 out of 19. A statistically significant knowledge about childhood autism spectrum disorder between different qualifications, and areas of specialties of physician & non-physician healthcare professionals ($p < 0.05$) was found. Healthcare professionals having prior training in and interaction with ASD have more significant knowledge ($p < 0.05$) than those who haven't trained before or don't have prior interaction with ASD. There is a non-significant difference among males and females, different age groups, and different durations of clinical experience of healthcare professionals.

Comparison of Effects of Mirror therapy and Virtual Reality in Improving Motor Function of Upper Limb of the Stroke Patients

Saleha Qamar¹, Shafaq Altaf¹, Ferwa Tahrim²

¹Department of Rehabilitation Sciences, Shifa Tameer e Millat University, Islamabad-Pakistan

²Riphah International University, Islamabad-Pakistan

Virtual reality (VR) is a latest technology. It is being used in commercial field as well as in medical field. It can be used for treatment and diagnosis of various medical conditions like vertigo, post-traumatic stress disorder, and other neurological disorders. The treatment of stroke and its rehabilitation is an extensive process which involves different stages. There are various treatment options for stroke like Virtual Reality (VR) and Mirror Therapy (MT). In this study, Oculus Quest 2 had been used which is portable, light weight and inexpensive. Moreover, it was a commercial gaming device so it was easily available in market. VR was compared with MT in patients with upper limb involvement.

From Lab to Leadership

Women Shaping the Future of Neuroscience



Total 32 participants were included. There were 16 participants in each group. Group A received VR via Oculus Quest 2 while Group B received MT via mirror therapy box. One hour treatment session was given to all participants for 5 days per week for 1 month. Fugl-meyer upper extremity scale (FMA), Action Research Arm test (ARAT) and Wolf Motor Function test (WMFT) were used to assess the motor components of each participant. After analysis, it was found that Oculus Quest 2 showed improvement in motor function of upper limb of the stroke patients. While when it was compared to mirror therapy, virtual reality was more effective in improving wrist and hand function. While in shoulder and elbow joints, both treatments had nearly similar effects.

Comparison of Otago exercises versus Resistance training on functional performance in stroke patients

Wardah Zafar¹, Hania Farheen², Zoya Mehmood², Nida Waseem³, & Syed Ali Hussain²

¹Yusra Institute of Rehabilitation Sciences, Yusra Medical and Dental College, Islamabad-Pakistan

² Department of Rehabilitation Sciences, Shifa Tameer-e-Millat University, Islamabad-Pakistan

³Institute of Health and Management Sciences, Islamabad-Pakistan

The Otago Exercise Program, is an effective protocol for fall prevention designed to improve balance, lower limb strength, and enhance overall functional performance. This study aimed to find the effects of Otago Exercises versus Resistance Training on functional performance and quality of life in chronic stroke patients. A single-blinded Randomized Control Trial (RCT) was conducted on 30 chronic stroke patients from August 2023 to February 2024, at Yusra Institute of Rehabilitation Sciences (YIRS) Islamabad, Pakistan. Chronic stroke patients of both genders between 40-60 years of age who were able to ambulate independently were included in the study. Participants were allocated into two groups using the sealed envelope method; Group A (Resistance Training) n=15, in which task specific activities like sit to stand, reaching in different directions, step training were performed and Group B (Otago Exercises) n=15, which included 12 balance and 5 strength exercises. Both groups received treatment 3 times a week for 4 weeks. Balance, strength, gait speed and quality of life were assessed before and after the treatment by Four Stage Balance Test (FSBT), Crane scale dynamometer, Timed Up and Go test (TUG) and Stroke Specific Quality of Life questionnaire (SSQOL) respectively. There was no significant difference ($p > 0.05$) between the two groups in balance, strength of quadricep muscle, hamstring muscle, iliopsoas, tensor fascia latae and gait speed. However, after 4 weeks of intervention, Otago Exercises showed statistically significant improvement ($p < 0.05$) as compared to Resistance Training in gluteus maximus strength and quality of life. Resistance Training and Otago Exercises, both groups showed significant improvement ($p < 0.05$) within the group for balance, strength, gait speed and quality of life. Therefore, it is concluded that Otago Exercises has no superior effects than Resistance Training in improving balance, strength and gait speed of chronic stroke patients.

From Lab to Leadership

Women Shaping the Future of Neuroscience



Gender Based Stroke Rehabilitation for Motor recovery of Upper Extremity

Maira Ruth, Saima Gul, & Fouzia Batool

Department of Rehabilitation Sciences, Shifa Tameer-e-Millat University, Islamabad-Pakistan

Gender differences have been shown across many domains, and motor skills are no exception. Males and females with stroke have equal access to core rehabilitation services. Despite equal access to these services, differences in functional outcomes of male and female stroke patients have been reported. In this study, examine the differences in motor function recovery in upper extremity balance, fine and gross motor skills & daily living performance of male and female stroke patients undergoing rehabilitation via combined action observation and imagery training. A single-blinded- randomized control trial was conducted at Quaid-e-Azam International Hospital providing 06 weeks of combined action observation and imagery training four time a week for 50 minutes. A sample of 36 stroke patients was selected in two groups (males & females). Post stroke patients were having ischemic or hemorrhagic with more than 24 points on SMMSE were included in this study. Severe dementia and neglected patient were excluded from this study. Participants were assessed for motor recovery, fine motor skills, daily living, quality of life at baseline and after 03 and at 6 weeks' protocol. Fugl Meyer Assessment Scale, Barthel Index, Box and Block Test, and Stroke Specific Quality of Life tool were used. Friedman & Wilcoxon Signed Rank Test shows significant improvement between baseline and treatment after 3 weeks and post treatment in motor recovery, hand dexterity, and ADLS ($p < 0.05$). According to the Mann Whitney U test, there was a non-significant improvement in ADLS whereas there was a significant improvement in the motor recovery, hand dexterity on the Mann Whitney U test between groups. It was concluded that males showed more significant improvement in ADLS. Whereas both males and females had non-significant improvement in hand dexterity, motor recovery and Post stroke depression.

Labor Ease: A Portable EHG Device for Preterm Birth Prediction

Muhammad Omar Cheema

Air University, Islamabad-Pakistan

Preterm pregnancies, occurring before 37 weeks of gestation, remain a significant global health concern, with 13.4 million cases reported by the World Health Organization in 2020. Common diagnostic methods include tocography, pelvic examinations, and ultrasound scans, but the electrohysterogram (EHG) offers a noninvasive alternative. EHG signals, recorded from the lower abdomen, reflect uterine electrical activity and are effective for predicting term and preterm pregnancies. This study presents a portable two-channel EHG device that records real-time signals, transmits them to a web app for visualization, and uses a cloud-based classification algorithm to predict pregnancy outcomes with 98% accuracy. The device also provides electrical stimulation for managing lower back pain in pregnant women. A generative adversarial network (GAN) was employed for data augmentation, improving classification performance. Data from 27 subjects using developed and standard devices validated the system, showcasing its potential for advancing maternal care and preterm birth prediction.

From Lab to Leadership

Women Shaping the Future of Neuroscience



Relationship of Heel Height with Q Angle, Patellar Position and Function in Working Females of Rawalpindi and Islamabad

Iffat Iqbal, Sumbal Rasheed, Samaviya Hadi Hashmi, & Hania Farheen

Department of Rehabilitation Sciences, Shifa Tameer-e-Millat University, Islamabad-Pakistan

The purpose of this analytical cross-sectional research was to find out the relationship of heel height with Q angle, patellar position and patellar function in working females of Rawalpindi and Islamabad, Pakistan. Study duration of this research was six months from August 2022 to January 2023. Women from different working fields were approached such as teachers, sales girls, business women and related fields. A total of 200 female participants were selected through non probability purposive sampling technique with age ranging from 18 to 35 years. Females wearing heels for minimum 4 hours per day and 5 days a week and heel height greater than 1 inch and less than 4 inches were included in the study. Females having any diagnosed knee pathology or underwent knee surgery were excluded from the study. A self- structured questionnaire was designed to obtain demographic data. Goniometer and Vernier calipers was used to measure Quadriceps angle and patellar position respectively. KUJALA questionnaire was used to assess patellar function. The data collected was analyzed using SPSS software version 23. The mean age and heel height wore by the participants was 27 ± 4 years and 2.35 ± 0.56 inches respectively. There was positive moderate significant correlation ($r=0.373$, $p<0.01$), negative moderate significant relationship ($r=-0.477$, $p<0.01$) and positive weak non-significant relationship ($r=0.068$, $p=0.339$) of heel height with Q angle, patellar position and patellar function respectively. This study concludes that with an increase in heel height there is an increase in Q angle and change in patellar position. Whereas, there is no relationship of heel height with patellar function.

Correlation Between Quadriceps Muscle Strength and Vertical Jump Height in Young Adults

Sumaira Kalsoom, Hanifa Nasir, Zoya Mehmood, Naila Inam, Tehreem Shahzad, & Rabia Afzal

Department of Rehabilitation Sciences, Shifa Tameer-e-Millat University, Islamabad-Pakistan

The quadriceps femoris, one of the strongest muscle groups in the body, plays a vital role in both knee extension and hip flexion. It generates the power necessary for explosive movements like a vertical jump. The strength of the quadriceps is directly linked to the ability to produce the force required for higher vertical jumps, highlighting their correlation in activities demanding lower-body power. Study was conducted with the purpose to determine whether there was any correlation between quadriceps muscle strength and vertical jump height in young adults. This cross-sectional study was conducted in Shifa Tameer e Millat University, Islamabad. The participants of this study were 400 young adults (18-26 years) who could perform vertical jump in addition who never undergone any surgical procedure, fractures, bone related issues or muscular injury of lower limb. Participants were selected through non-probability sampling technique and Rao software was used to calculate the sample size. They performed a maximal vertical

From Lab to Leadership

Women Shaping the Future of Neuroscience



jump to their capacity; their vertical jump height was measured 3 times. Quadriceps muscles strength was also measured by hand held dynamometer, placed above external malleoli with 3 consecutive maximal contractions performed. The results demonstrated that there is a strong positive correlation exists between quadriceps muscle strength of right and left leg with vertical jump height ($r = 0.64$, $p = 0.00$), ($r = 0.66$, $p = 0.00$) respectively. In males, a very weak positive correlation among vertical jump height and strength of right leg and left leg was found which is statistically not significant, ($r = 0.08$, $p = 0.4$) ($r = 0.16$, $p = 0.09$) respectively. In females a very weak positive association among vertical jump height and strength of right leg and left leg was observed which is statistically significant ($r = 0.14$, $p = 0.01$), ($r = 0.16$, $p = 0.005$) respectively. The study concluded that Quadriceps muscles strength has linear relationship with vertical jump height and is a significant predictor of vertical jump height. So, increased muscles strength is associated with higher vertical jump.

Impact of Body Mass Index and Long Standing Upon Achilles Tendon Among Nurses

Umyya Wilait, & Nazia Mumtaz

Shifa Tameer-e-Millat University, Islamabad-Pakistan

Achilles Tendinopathy is caused by overuse, overload, repetitive and prolonged duration of stress and strain applied at the Achilles tendon, which in turn results in pain, stiffness, swelling and irritation at this level. The Achilles tendon is present at the back of the lower leg that attaches the calf muscle to the heel bone performing the function of walking, running, climbing stairs, jumping, and standing on tip toes. It is a cross-sectional study that is aimed to determine the prevalence of Achilles tendinopathy among nurses of Sargodha district and its relationship with standing hours and body mass index. The non-probability convenient sampling technique will be used in selection procedure of the population. As calculated by formula the sample size is 351.8 which is approximated to 352. Participants will be selected according to the inclusion criteria of the study. For data collection, a Victoria Institute of School Assessment - Achilles (VISA-A) questionnaire as functional questionnaire, Royal London Test as diagnostic test and Numerical pain rating scale (NPRS) for the assessment of the pain will be used to assess pain among nurses to evaluate and examine Achilles tendinopathy. Data will be analyzed and compiled by using SPSS. All the elements and factors contributing to Achilles Tendinopathy in nurses and their relationship specifically with standing hours and body mass index (BMI) on will be observed.



The Prevalence of Urinary Incontinence Among Pregnant Women in their Second Trimester in Tertiary Care Hospitals, Peshawar

Misbah Tahir¹, Anisa Hussain¹, Ghazala Qamar², Saima Gul¹, & Fouzia Batool¹

¹Department of Rehabilitation Sciences, Shifa Tameer -e- Millat University, Islamabad-Pakistan

²Abasyn University, Peshawar-Pakistan

Urinary incontinence (UI) is a common condition among pregnant women, particularly during the second trimester, due to physiological and anatomical changes in the urinary tract and pelvic floor. Despite its impact on quality of life, it is often underreported and undertreated in many regions, including Peshawar, Pakistan. This study aims to determine the prevalence of urinary incontinence among pregnant women in their second trimester attending tertiary care hospitals in Peshawar. A cross-sectional study was conducted in hospitals in Peshawar from March to August, 2022. A total of 221 pregnant women in their second trimester were recruited using convenient sampling. Data were collected using a validated questionnaire (The International Consultation on Incontinence Questionnaire (ICIQ)). Statistical analysis was performed to determine the prevalence and identify potential risk factors. The mean age of the participants was 29.36 years (± 7.96). Among the 221 participants, the prevalence of urinary incontinence during second trimester was found to be 60.1%. UI was most prevalent in the 30–39-year age group, affecting 70% of women in this category. Urinary incontinence is highly prevalent among pregnant women in their second trimester in tertiary care hospitals in Peshawar. These findings underscore the need for increased awareness, routine screening, and targeted interventions to improve maternal health outcomes.

Factors causing delay to surgical treatment in geriatric neck of femur fracture patients: a case control study

Hamza Chaudhary¹, Mahtab Zafar², Syed Bokhari³, & Ariba Waheed⁴

¹King Edward Medical University, Lahore-Pakistan

²Rahbar Medical And Dental College, Lahore-Pakistan

³General Hospital Dudley, West Midlands-UK

⁴Lahore Medical And Dental College, Lahore-Pakistan

Current guidelines recommend that surgeons perform hip fracture surgery within 24 hours of injury as observational studies suggest earlier surgery is associated with better functional outcome, shorter hospital stays, and lower rates of complications and mortality. This was a retrospective review of patient records at a General Hospital in Dudley West Midlands UK. Patients undergoing Surgical treatment for intra capsular(IC) or extra capsular(EC) hip fractures were included. Sample size is 300. Chi square test is applied to show association between the factors involved. Case group includes patients with surgery time more than 36 hours and control group is the one with patients having a less than 36 hours of surgery time. p value less than 0.05 is considered to be significant.

From Lab to Leadership

Women Shaping the Future of Neuroscience



Significant association exists between time to surgery (TTS) and length of hospital stay with a p value of 0.036. No significant association exists between TTS and Mortality with a p value of 0.924. Among the factors causing delay for the surgery only gender has been significantly associated with TTS with a p value of 0.001.

TTS greater than 36 hours significantly affects the duration of hospital stay for more than 2 weeks but has no significant association with the overall Mortality. So when comparing it with the guidelines if the surgery gets delayed by more than 36 hours it won't have a significant impact on the mortality.

Effect of Task Oriented Functional & Balance Training on Unsupported Sitting Balance in Paraplegic Patients

Fariha Zulfiqar¹, Fouzia Batool², & Saima Gul²

¹Department of Allied Health Sciences, IQRA National University, Peshawar-Pakistan

²Department of Allied Health Sciences, Shifa Tameer-e-Millat University, Islamabad-Pakistan

Spinal cord injury (SCI) often leads to impaired functional abilities and reduced quality of life (QOL). This randomized controlled trial evaluated the effects of task oriented functional and balance training combined with conventional physical therapy compared to conventional therapy alone on balance, fear of falling, goal attainment, and QOL in paraplegics. The study was conducted over six months (February–July 2022) at the Paraplegic Centre Peshawar, Pakistan. A total of 30 individuals were randomly assigned to either task-oriented functional and balance training with conventional therapy (intervention group) or conventional therapy alone (control group). Outcome measures included the Goal Attainment Scale (GAS), Modified Functional Reach Test (mFRT), Spinal Cord Injury Falls Concern Scale (SCI-FCS), Trunk Control Test (TCT), Maximal Lean Test (MLT), and Short Form Health Questionnaire (SF-36). Within-group analysis showed statistically significant improvements across all outcomes, including TCT, MLT, mFRT, SCI-FCS, GAS, and SF-36. However, between-group analysis showed no significant differences in TCT, mFRT, SCI-FCS, GAS, and SF-36 ($p > 0.05$), except for MLT and SF-36, where significant differences favored the intervention group ($p < 0.05$). Task-oriented functional training combined with conventional therapy significantly enhances specific functional outcomes and QOL in paraplegics. These findings underscore the importance of integrating task-oriented approaches in SCI rehabilitation to improve functional independence and overall well-being.

Comparison of Static and Dynamic Balance during and after Menstruation in Healthy Female Adults

Wania Jahangir

Wania Jahangir, Ayesha Liaquat, Areej Mazhar, Fouzia Batool, & Saima Gul

Department of Rehabilitation Sciences, Shifa Tameer-e-Millat University, Islamabad-Pakistan

Menstruation is a physiological process that can affect various physical and neurological functions, including balance. Balance, encompassing both static and dynamic forms, is essential for daily activities and physical performance. Hormonal fluctuations throughout

From Lab to Leadership

Women Shaping the Future of Neuroscience



the menstrual cycle can influence proprioception and neuromuscular coordination, resulting in changes in balance. This study aimed to compare static and dynamic balance in healthy females during and after menstruation and to explore the association between balance performance and the menstrual cycle. A comparative cross-sectional study was conducted with a sample of 176 healthy female participants aged 18–25 years, selected through non-probability convenience sampling. Participants with neurological or gynecological conditions, irregular menstrual cycles within the last three months, recent lower extremity injuries, and being married or pregnant were excluded. Static balance was assessed using the Single-Leg Stance (SLS) test, while dynamic balance was evaluated using the Y-Balance Test. Data analysis was performed using SPSS version 23. The study revealed significant differences in balance performance during and after menstruation. During menstruation, mean SLS scores (eyes open) were 12.05 ± 5.7 seconds (left leg) and 24.18 ± 4.4 seconds (right leg), while SLS scores (eyes closed) were 4.85 ± 3.0 seconds (left leg) and 14.73 ± 2.1 seconds (right leg), all significantly lower than in the non-menstrual phase ($p < 0.005$). Composite Y-Balance Test scores were also reduced during menstruation (67% left leg, 70.7% right leg) compared to non-menstrual periods (86.9% left leg, 88.4% right leg), with statistically significant differences ($p < 0.00$). The study concludes that healthy young females exhibit significantly lower static and dynamic balance during menstruation compared to after menstruation. These findings suggest that menstrual cycle phases should be considered when assessing balance and planning physical activities or rehabilitation programs.

Prevalence of Mechanical Low Back Pain in Patients having different Job Natures

Muhammad Fahim, Fatima Khalil, Maria Hussain Sayyada, Hafiz Zayn Zafar,
& Khalil Ahmad
KRL Hospital, Islamabad-Pakistan

Mechanical low back pain arises from intrinsic spine issues, intervertebral discs, or paraspinal soft tissues. Workplace environment leads to repetitive trauma to spine that may cause mechanical low back pain. Worldwide prevalence of mechanical low back pain is 23%, with recurrence rates of 24-80%. Diagnosis relies upon history, clinical examination, imaging, and workplace assessment, including posture, job nature, and repetitive activities. To determine the prevalence of mechanical low back pain in patients having different job natures.

It was Descriptive (Case Series) study, conducted at Department of Rehabilitation Medicine, KRL Hospital Islamabad, a tertiary care teaching institute with a dedicated pain management clinic and rehabilitation facilities. 96 patients with low back pain, engaged in different occupations were included. Visual analogue pain scale was used to measure the severity of mechanical back pain. Patients were enrolled through purposive sampling after ethics committee approval. Informed consent was obtained, and detailed pain history, clinical examination, and investigations were conducted.

From Lab to Leadership

Women Shaping the Future of Neuroscience



Among 96 patients, 70% had Mechanical low back pain, with 60% involved in heavy weight lifting and the remainder in prolonged sitting jobs. Severe pain initially affected 46.27%, which reduced to 2.98% after six weeks of rehabilitation.

Mechanical low back pain impacts quality of life, causing psychosocial and financial issues. Effective rehabilitation, including pain management and workplace adjustments, is crucial.

Dysarthria prevalence in post-stroke patients.

Malaika Ejaz, Laiba Ejaz, Tabbasum Khan, Samina Firdous, Aminah Iqbal, & Nadia Bashir

Riphah International University, Islamabad-Pakistan

Dysarthria, a motor speech disorder resulting from neurological damage, significantly impacts communication and quality of life. This study aimed to determine the prevalence of dysarthria in post-stroke survivors aged 30 years and above using the Robertson Dysarthria Profile (Revised). A total of 170 participants were recruited through a convenience sampling technique, including both male and female patients who met the inclusion and exclusion criteria. Data collection was carried out in private and government hospitals and clinics across Rawalpindi and Islamabad. The findings revealed that the prevalence of dysarthria among post-stroke survivors was 61.7%. This high prevalence highlights the critical need for early diagnosis and targeted rehabilitation for individuals affected by stroke. The high prevalence of dysarthria among post-stroke survivors calls for the integration of routine speech and language assessments into stroke rehabilitation programs. Public and private healthcare systems should prioritize training for professionals to identify and manage dysarthria effectively.

Furthermore, awareness campaigns focusing on the importance of early intervention in post-stroke communication disorders can contribute to improved outcomes and overall patient well-being. Future research should explore the efficacy of various therapeutic approaches to enhance recovery in dysarthric patients.

Improvement in Cognition by Prednisolone in an intracerebroventricular Streptozocin-induced Alzheimer's disease mouse model may involve Fyn kinase inhibition

Halima Usman, Rabia Gul, & Sagheer Ahmed

Shifa College of Pharmaceutical Sciences, Shifa Tameer-e-Millat University, Islamabad-Pakistan

Alzheimer's disease (AD) affects cognitive decline and causes neurological symptoms. Traditional treatments offer limited relief, targeting cholinergic transmission without altering amyloid plaques and tau tangles. Fyn kinase is an emerging therapeutic target. In-silico studies identified prednisolone as Fyn kinase inhibitor. Adult Swiss albino mice were divided into six groups, including a sham control, STZ group, donepezil-treated positive control, and three prednisolone-treated groups with varying doses (25, 50, 100 mg/kg). Cognitive functions were assessed using Novel Object Recognition (NOR), Morris Water Maze (MWM), and Elevated Plus Maze (EPM) tests. Histological analyses included Congo Red, Hematoxylin-Eosin, and Nissl staining. Gene expression of AD markers including Fyn,

From Lab to Leadership

Women Shaping the Future of Neuroscience



App, tau, Dlg4, Gfap, Bdnf, Cal1, Ide, Nep and Sv2a were evaluated using qPCR. Prednisolone treatment led to significant improvement in cognitive status of mice, accompanied by reduction in amyloid buildup and neuronal loss. Additionally qPcr results revealed significant decrease in Fyn expression. Prednisolone shows potential as a therapeutic agent for AD by targeting Fyn kinase, warranting further investigation into its clinical application.

A novel approach for the detection of muscle atonia to monitor sleep dream using EMG and EOG

Anusha Ishtiaq, & Noor Fatima

Air University, Islamabad-Pakistan

Sleep is an intricate physiological process that is characterized by various stages. REM (Rapid Eye Movement) sleep is distinct from the other stages because it is associated with vivid dreaming, which is represented by a mix of low muscular tone (atonia) and enhanced eye movement activity. This study aims to investigate electromyography (EMG) and electrooculography (EOG) signals for differentiating normal sleepers from individuals with disturbed REM atonia. In normal REM sleep onset, EMG activity decreases significantly because the muscles are atonic as eye movements increase randomly. We collected and analyzed EMG and EOG data from subjects during sleep. Early results suggest that the normal state of REM in which one is dreaming, reduced EMG tone and increased EOG activity is seen. However, Sleep Disorder, namely R.E.M. Sleep Behavior Disorder (RBD), is characterized by the absence of the physiological muscle atonia of the muscles during R.E.M. sleep, resulting in abnormal movements during dreams. The findings of this sleep study strengthen the role of EMG and EOG in interpreting normal and pathological patterns of sleep dreams, illustrating this noninvasive method's potential for improved diagnosis and comprehension of sleep disorders.

Relationship of Lumbopelvic Pain with Cardiorespiratory Fitness, Physical Activity and Quality of Life in Pregnant Females

Maleeha Naseer, Zoya Mehmood, Aimen Malik, Iqra Imtiaz, Hania Farheen, & Naveed Ahmed

Department of Rehabilitation Sciences, Shifa Tameer-e-Millat University, Islamabad-Pakistan

Pregnancy-induced physical and hormonal changes often cause lumbopelvic pain, affecting daily life. Regular physical activity is essential to manage this pain and maintain overall well-being. This study aimed to determine the intensity of lumbopelvic pain (LPP) and its relationship with cardiorespiratory fitness, physical activity, and quality of life in pregnant females. An analytical cross-sectional study was conducted in Rawalpindi and Mirpur, Azad Kashmir, between August 2023 and January 2024. The sample consisted of 300 pregnant females in their second and third trimesters, experiencing LPP, selected through non-probability convenient sampling. Participants with high-risk conditions such as pregnancy-induced hypertension, persistent bleeding, gestational diabetes, or cardiorespiratory disorders were excluded.

From Lab to Leadership

Women Shaping the Future of Neuroscience



Data was collected using a self-structured demographics questionnaire, the Numeric Pain Rating Scale, the Pregnancy Physical Activity Questionnaire, and the Quality of Life (QOL)-GRAV questionnaire. Cardiorespiratory fitness was assessed using the 6-minute walk test (6MWT). The results showed that the mean age and BMI of participants were 24.75 ± 2.89 years and 26.16 ± 3.10 kg/m², respectively. Among the participants, 180 (60%) reported mild LPP. Approximately 118 (39.4%) were categorized as having light physical activity, followed by moderate physical activity. LPP was weakly but significantly correlated with physical activity ($p < 0.01$) and QOL ($p = 0.15$), while no significant correlation was found with cardiorespiratory fitness ($p > 0.05$). This study concluded that physical activity and QOL exhibited a weak significant correlation with LPP, suggesting their potential influence. However, cardiorespiratory fitness was not significantly associated with LPP in the second and third trimesters of pregnancy.

Effect of Tai Chi Intervention for Improving Motor Skills and Executive Function in Older Adults

Rabyya Fatima, Saima Gul, Saher Fatmi, & Fouzia Batool

Department of Rehabilitation Sciences, Shifa Tameer-e-Millat University, Islamabad-Pakistan

Tai Chi (TC) is a low intensity ancient Chinese technique which helps people of all age brackets to regain their lost or declining physical health and executive functions (EF) which involve abstract thinking, reasoning, planning and memory. This study aimed to see the effect of Tai Chi intervention for improvement of motor skills and executive functions. 70 healthy people of age (above 60 years) were recruited via non-probability convenient sampling. It is a single-blinded- randomized control trial providing low impact activity for a duration of 6 consecutive weeks for 5 days per week. Both males and females of 60 years and above and single leg stance test score less than 20 seconds were included in the study. Participants were assessed for mobility, functional balance, quality of life and their activity of daily living at baseline and then at the end of 6 weeks protocol. Single Leg Stance (SLS), Time Up and Go Test (TUG), Barthel Index (BI), stroop test, Trail making test and WHOQOL tool was used. Mean age was reported as 66.6 ± 3.22 years and 65 (92.8%) males and 5 (7.1%) females were present in the study. Wilcoxon Signed Rank Test showed significant improvement in TUG, BI, SLS and mini-Stroop test while paired t-test showed significant improvement in trail making test within groups ($p < 0.005$). According to the Mann Whitney U test, there was a significant improvement in the TUG, BI, SLS and mini-stroop test between groups. A better functional performance makes independence in managing daily tasks and enhances the functional status to achieve the optimal goals. It is concluded that Tai Chi training improve motor skills and executive function of an individual's balance and mobility, and can be used in a health care context or at home as an effective measure to enhance balance.

From Lab to Leadership

Women Shaping the Future of Neuroscience



Impact of Climate Change on Health and Well-Being Among University Students: Investigating the Relationship Between Climate Change and Health Outcomes Among University Students

Saif U. Zahid, Saad Akram, Isha Akram, Hira Sakhawat, & Badur-un-Nisa

Department of Rehabilitation Sciences, Shifa Tameer-e-Millat University, Islamabad-Pakistan

Climate change has been an on-going global crisis that has affected a large population and is expected to increase in the coming years. It does not only affect our surrounding environment but also our health and well-being. Pakistan is among the top countries in world which are the most-affected due to climate change. This study is intended to investigate the effects of climate change on the health and conduct a gender-sensitive analysis relating it to the well-being and health outcomes of university students in Pakistan. This study seeks to investigate the association between climate change-related factors such as rising temperatures, changes in air quality, and extreme weather events and a variety of student health outcomes, including physical health, mental well-being, and academic achievement. By finding these correlations, the study aims to contribute to a better understanding of how climate change affects the health and daily life of young adults in an academic setting. The findings are intended to help universities develop policies and methods for minimizing climate change's negative effects on student health and well-being. The findings from the study will provide valuable insights that will fill existing gaps that will contribute to a deeper understanding of the dynamics between the health outcomes and how it effects the genders.

Association of Cognitive Impairment with Physical Functioning in Diabetic Patients

Farwa Khaliq¹, Nayab John², Farooq Islam², Sadia Iftkhar¹, Maham Irshad¹, & Rimsha Ahoor³

¹University Institute of Physical Therapy, University of Lahore, Lahore-Pakistan

²Department Of Rehabilitation Sciences, University of Chenab, Gujrat-Pakistan

³School of Allied Health Sciences, CMH Lahore Medical College, Lahore-Pakistan

Hyperglycemia is one of many issues associated with diabetes. The current classification distinguishes two major categories: type 1 diabetes (T1DM) and type 2 diabetes (T2DM). It is a concern since cognitive impairment causes disability and increases healthcare costs. Diabetes self-management might suffer as a result of cognitive impairment, which can lead to severe difficulties. A population-based cross-sectional study was conducted. A total of 244 diabetic patients aged 35 and older participated in the study. Data was gathered via non-probability convenient sampling and a questionnaire. Demographic information such as gender, age, level of education, and marital status were gathered. Data was gathered in hospital settings. The Mini-mental State Examination (MMSE) was also utilized to assess their cognitive performance. The physical performance of the patients was evaluated using a short physical performance battery evaluation. On diabetic patients, a cross-sectional investigation was conducted.

From Lab to Leadership

Women Shaping the Future of Neuroscience



A total of 244 patients with age 35 or more than 35. Research was carried out in hospitals. Mini-mental State Examination (MMSE) used to determine their cognitive performance. Physical performance of patients checked by Short physical performance battery test. Results showed that there was a Positive correlation between mini mental state examination and short physical performance battery of the patient which is highly significant because the P value is <0.001 . Pearson value is 0.75 that indicates strong correlation.

A Comparative study to assess the effect of Balance Training with and without Taping on Balance in Stroke patients

Amina Farid Khan, Fouzia Batool, & Saima Gul

Department of Rehabilitation Sciences, Shifa Tameer-e-Millat University, Islamabad-Pakistan

This study's objective was to distinguish between the effectiveness of balance training with taping and balance training without taping on balance in individuals suffering with sub-acute or chronic stroke. It was a single blinded prospective randomized controlled trial. It was conducted at Pakistan Institute of Rehabilitation Sciences, Islamabad. This study was conducted in the duration of 4 months from May, 2023 to August, 2023. The Iranian clinical registry IRCT ID of the study is IRCT20211022052835N7. All participants enrolled in this study were of age more than 35 years. The total sample size of the study was 36. Participants were enrolled on the basis of inclusion and exclusion criteria. Assignment of participants were performed randomly to Experimental group (Balance Training with Taping) and Control group (Balance Training without Taping) through sealed envelope method. Before and after the treatment, outcome measures berg balance scale were used. Intervention were administered for 30 minutes per day, 3 sessions every week for consecutive four weeks. The mean age of the participants was 52.19 ± 11.38 year. Balance training with taping had significantly higher results in balance recovery than balance training without taping ($p < 0.05$). Both groups' findings in a within-group analysis for outcome measure was significant ($p < 0.05$). The conclusion of this study was that balance training along with taping is more effective for the improvement of balance than balance training without taping in sub-acute to chronic stroke patients.



Diversity Booth

Advocating for a BS in Neuroscience: Bridging Gaps in Diversity

Inciya Shoaib

PGC, Islamabad-Pakistan

Pakistan lacks a dedicated undergraduate program in neuroscience, depriving students—especially women and marginalized communities—of opportunities to engage in this rapidly advancing field. My project focuses on advocating for the establishment of a BS in Neuroscience, emphasizing its potential to address diversity gaps in STEM education. Neuroscience is essential for understanding the capacity of the mind, and tackling conditions like neurodegenerative diseases, yet the field remains underrepresented in Pakistan's academic landscape, being associated only with neurosurgery. Women and students from underserved regions face additional barriers due to socio-economic inequalities and limited exposure to STEM fields. By introducing this program, we can empower underrepresented groups to contribute to research and innovation, fostering diverse perspectives crucial for groundbreaking discoveries. My project highlights the need for inclusivity by proposing scholarships, mentorship programs, and accessible curricula. At the Diversity Fair, I aim to showcase infographics on gender and regional disparities, a roadmap for establishing neuroscience programs in Pakistan, and examples of how such initiatives have transformed education globally. This advocacy aligns with my passion for neuroscience and my belief in the transformative power of education. Through this project, I aim to spark conversations about inclusivity in STEM and demonstrate how diverse perspectives can shape the future of neuroscience in Pakistan.

From Lab to Leadership

Women Shaping the Future of Neuroscience

Calling all neuroscience enthusiasts, researchers, students, educators and advocates for gender diversity in **STEM**



PROGRAM

6th December 2024

Shifa Tameer-e-Millat University, Islamabad-Pakistan

Time	Session	Speaker	Affiliation
9:00-09:30 AM	REGISTRATION		
09:30-09:35 AM	Opening	Tilawat & Anthem	
09:35-09:40 AM	Conference Introduction	Dr. Saima Gul	Shifa Tameer-e-Millat University, Islamabad
09:40-09:45 AM	Welcome Address	Vice-Chancellor	Shifa Tameer-e-Millat University
09:45-09:50 AM	Address of Dean	Prof. Dr. Tausif. A. Rajput	Shifa Tameer-e-Millat University
09:50 -10:00 AM	Address of Chief Guest	Prof. Dr. Anila Kamal	Rawalpindi Women University
10:00- 10.05 AM	Address of HoD	Prof. Brig. Dr. Aamir Waheed	Shifa Tameer-e-Millat University
10:05 -10:15 AM	Message	Prof. Dr S. Ather Enam	Founding President, PASBAN
10:15 -10:40 AM	Plenary Talk	Prof. Dr. Sohail A Qureshi	Director ORIC, Shalamar Institute of Health Sciences
10:40 -11:00 AM	Thematic Talk	Dr. Sadaf Ahmed	President (Elect) PASBAN
11:00-11:15 AM	SOUVENIR DISTRIBUTION		
11:15-11:45 AM	Networking Break	POSTER PRESENTATIONS WITH HIGH TEA <i>Structured networking session for attendees to connect with peers and mentors</i> Panelists: Dr Ayesha Maqbool (VU), Prof. Dr. Zia Mohiuddin (Air University)	
11:45 -12:40 PM	PANEL SESSION: BREAKING BARRIERS IN NEUROSCIENCE LEADERSHIP Prof. Dr. Sohail A Qureshi (SIHS), Dr. Sadaf Ahmed (PASBAN), Prof. Dr. Nikhat Siddiqui (Ziauddin University), Dr. Sana Arshad (AFIRM), Dr. Memoona Siddiqui (STMU), Dr. Jamila Akhter (Air University) & Dr. Maryum Ibrar (PASTIC) Moderator: Dr Nida Khan (AEIRC)		
12:40-12:50 PM	SOUVENIR DISTRIBUTION		
12:50-2:10 PM	LUNCH BREAK		
1.00 PM-2.00 PM	PARALLEL ONLINE LECTURES OF WOMEN NEUROSCIENTISTS Dr. Rizwana Amin (EFFAT UNIVERSITY, JEDDAH) Dr. Rukhsana Nawaz (AL-AIN UNIVERSITY, DUBAI) Dr. Farina Hanif (DOW UNIVERSITY, KARACHI)		
2:10-3:10 PM	PANEL SESSION: MENTORSHIP AND SUPPORT NETWORKS FOR FEMALE NEUROSCIENTISTS Prof. Dr Saadia Zahid (NUST), Prof. Dr. Abida Shaheen (STMU), Dr Shamoon Noushad (AEIRC), Dr Ayesha Maqbool (VU) & Prof. Dr. Zia Mohiuddin (Air University), Dr Saima Gul (STMU) Moderator: Dr. Sadaf Ahmed (AEIRC)		
3:10-3:30 PM	SOUVENIR DISTRIBUTION		
3:30-3:55 PM	Conference Conclusion	Prof. Brig. Dr. Aamir Waheed Butt	Shifa Tameer-e-Millat University

From Lab to Leadership

Women Shaping the Future of Neuroscience



Published by:

