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Multidisciplinary Trends of Studies in India

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Multidisciplinary Trends of Study in India

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In a world of many rapid social changes in every place, interdisciplinary research providing solutions to complex global issues is necessary right now. Empowering Futures: Interdisciplinary Views of Education, Health and Social Responsibility is a compilation of various scholarly contributions showcasing the transformative role of education, healthcare, and corporate social responsibility on equitable and sustainable futures. As the editor and Director of Cunitive OPC Private Limited, I am proud to introduce this edited volume with seven authors providing insightful chapters.

This eBook is born from the desire to explore how purposeful interventions in education, health, and social responsibility can further empower individuals and communities to disrupt systemic barriers to reach full potential. The chapters demonstrate a range of disciplines supporting a multi-faceted understanding of empowerment. Dr. Smriti Lata Sinha reflects on ways in which schools will underpin adolescent girl's self-efficacy and aspirations through gender inclusive curriculums and mentoring. Mr. Amit Parashar examines corporate social responsibility in relation to perceptions from employees around brand reputation without consequences to financial performance. Dr. Saurav Majumdar, Dr. Akshita Khare, and provide a pioneering case study on Grey Zone Lymphoma related to hernia mesh repair surgery to showcase medical diagnostic innovations. Finally, Khomdram Raju Singh, Khomdram Sheila Devi, Dr. Khadangbam Mukta Singh explore emerging trends in physical education as they relate to technology and inclusivity are making advances forward increasing lifelong fitness.

Every chapter provides a part in the overall empowerment narrative every chapter illustrates the intersections of education, health, and ethical practices in fostering social change towards empowerment. The integration of education, health, and ethical practices in the discussions of the chapters will, we hope inspire researchers, educators, administrators, policymakers, and practitioners to work in an interdisciplinary way. We hope that the authors and themes in this edited volume will provide a fresh lens to consider innovative efforts to solve the significant challenges facing global issues such as gender issues, public health, and sustainable development.

As the publisher Cunitive OPC Private Limited seeks to create a positive difference in advancing knowledge by publishing real, rigorous, and accessible research. We are thrilled to be a partner in the development of the edited book that aligns with the mission and vision of Cunitive OPC Private Limited for innovation and social change. I would like to acknowledge with most grateful thanks of the insights and commitment of the Authors of the chapters for their scholarship and thank the Editorial Team for their attentive work during the development of this volume.

This eBook is written for a global audience of scholars, students, and practitioners looking to gain an understanding of how education, health and social responsibility intersect to improve the future. I hope it creates important conversations to support more action towards an inclusive future of empowerment.

Dr. Runu Waikhom
Editor & Director, Cunitive OPC Private Limited
August 2025

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CHAPTER 1:

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EMPOWERMENT THROUGH EDUCATION: THE ROLE OF SCHOOL IN SHAPING ADOLESCENT GIRLS' SELF- EFFICACY AND ASPIRATIONS

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 ABSTRACT: Instruction serves as a foundation for enabling young juvenile ladies, significantly forming their self-efficacy and goals. Schools offer organised situations where young ladies develop fundamental aptitudes, confidence, and leadership through academic engagement, steady mentorship, and exposure to different role models. This paper examines the role of school-based mediations in fostering pre-adolescent girls' self- belief and enhancing their individual and professional aspirations. Programs such as mentorship activities, STEM (science, technology, engineering, and mathematics) instruction, and comprehensive educational modules are instrumental in challenging sex generalisations and advancing sex value. Mentorship programs connect young women with inspiring role models who empower confidence and aspiration, providing guidance to tackle societal challenges. STEM activities lock in young ladies in areas customarily dominated by men, broadening their career paths and cultivating confidence in their specialised skills. Comprehensive educational module that highlights differing female accomplishments,

countering constraining generalisations, strengthening girls' potential to succeed in changed spaces. Past scholastics, schools act as secure sanctuaries for enthusiastic and social development, tending to issue like gender-based segregation and societal desires that regularly compel girls' yearnings. By combining meticulous scholarship with enthusiasm and social engagement, schools create comprehensive environments that empower young women to overcome obstacles and envision themselves in leadership roles. The paper also analyses how extracurricular activities, such as administration clubs and peer support groups, assist in upgrading self-efficacy by cultivating collaboration and self- expression. These intercessions collectively prepare young ladies with the mental, emotional, and social instruments required to pursue driven objectives and challenge systemic imbalances. The considerations emphasise the need for maintaining speculation in gender-focused educational techniques to ensure pre-adolescent girls develop the self-efficacy required for long-term success. Schools are more than scholarly teachers; they are transformative spaces that disassemble boundaries, sustain strength, and motivate young ladies to dream strongly. By prioritising evenhanded instruction, schools clear the way for pre-adult young ladies to realise their full potential, contributing to comprehensive and engaged prospects.

Keywords: adolescent girls, self-efficacy, aspirations, education, empowerment, gender equity, school-based interventions, mentorship, STEM, inclusive curricula

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1: INTRODUCTION

Managing our secondary schools is the duty of our principals, who are also instructional leaders. To enhance school development, learning outcomes, and students' academic achievement, it is crucial to reequip secondary schools, which serve as an essential link between elementary and higher education. Because our

educational system is complicated and because principals provide instructional leadership that determines whether schools succeed or fail, principals must participate in professional development programs that include capacity building. After students have completed the first ten years of compulsory schooling and passed the Joint Admissions and Secondary Certificate of Education (JAISCE), they are eligible to enroll in the Post Basic Education and Career Development (PBECD) program, which the principals oversee. It encompasses (i) secondary school, (ii) college, and (iii) vocational enterprise institution continuing education. (Nigerian Federal Government, 2013:12).

According to Bandura (1994) and Saks (2024), self-efficacy is "the degree to which an individual believes in his or her ability to carry out a task, reach a goal, or achieve academic success." This belief is particularly important for students because it influences their academic decisions and actions, which boosts confidence, allows them to face challenges, and ultimately leads to success. Students' perceptions of their abilities may differ significantly according to demographic factors, such as age and gender (Hitches et al., 2022). A person's self-efficacy represents their conviction in their skills, encompassing how they handle obstacles, the effort they put in, and their tenacity in overcoming those challenges. It is more than simply a measure of confidence. Consequently, individuals are more likely to demonstrate self-efficacy and achieve greater results if they actively participate in learning, establish ambitious objectives, and persist (Bandura, 1994; Saks, 2024). "In addition, academic performance—as measured by grades, test scores, and overall academic achievement—often serves as a visual representation of these outcomes, providing insight into a student's progress and prospects (Thornton, 2022)." In light of these disparities between the sexes, it is crucial to examine the dynamics of the relationship between self-efficacy and academic achievement. "There have been prior discussions

of gender disparities and their impact on academic performance and self-efficacy." Some of the research suggests that these differences are influenced by cultural norms, social expectations, and the educational setting (Wrigley-Asante et al., 2023).

For example, despite being as good as, or even better than, males in STEM fields, female students tend to have lower levels of self-efficacy in these areas (Yoshikawa et al., 2018; Voyer & Voyer, 2014). This might cause them to struggle academically or avoid particular topics altogether, which would hurt their grades. However, students' lack of preparation or underperformance might be due to overconfidence; this is especially true for male students, who may exhibit stronger self-efficacy even in traditionally female-dominated fields (Wilson et al., 2015; Penner, 2015). "To understand the relationship between self-efficacy and academic performance, it is crucial to examine the gender-specific patterns that vary between male and female students". When examining the correlation between confidence in one's abilities and academic success, gender differences may be particularly nuanced. Students who demonstrate greater levels of self-efficacy tend to be male, especially in the domains of science and mathematics. Female students, on the other hand, are more likely to excel in social and humanities disciplines, although they may underperform due to a lack of confidence in their abilities (Else-Quest et al., 2020). These findings may also be associated with other variables, such as intrinsic motivation, learning style, and psychological health, which may differ among genders (Hayat et al., 2020). Low self-efficacy leads to poor academic performance, especially in high-stakes situations, among female students who suffer from anxiety (Mao et al., 2019). Conversely, male students often experience poor self-efficacy due to performance-related pressures and the impact of adhering to conventional gender norms on their academic choices (Eakman et al., 2019).

In contrast to Eakman et al. (2019), Van Soom & Donche (2014) maintained that gender differences in motivational characteristics are possible. Nonetheless, substantial changes in self-confidence are not always the result. They go on to say that although gender may affect academic motivation in specific ways, it may not have a significant impact on self-efficacy, especially in STEM fields.

1.1 Empowerment

Individuals and groups are considered empowered when they have a high degree of freedom and self-determination. Because of this, they can freely and responsibly advocate for their interests and create their rights. The goal is to build self-assurance to the point where you feel comfortable standing up for yourself and your rights. When individuals take action, they can overcome feelings of helplessness, focus on what is important, and make the most of their resources, whether that is at work or in their personal lives. Feminists and other thinkers have shown that human beings possess unique capacities for interpersonal connections.

For individuals to feel empowered they must be able to influence decision-making and take appropriate action, which can only be achieved when societal disadvantages are removed (Rowland, 1997).

Developing one's agency is the essence of empowerment. One definition of empowerment is the process of increasing one's self-awareness, thereby enhancing one's ability to participate in and shape one's own life. Furthermore, empowerment is a process that occurs both individually and in groups. At times, it entails individuals working together with the common goal of acquiring the information and skills necessary to initiate and direct change. Empowering women means giving them the agency to make their own choices about how they live their lives and how the government addresses specific challenges.

Everyone has the potential to make the most of their education, career, and personal life while facing some obstacles. People are given the chance to make choices about their lives via empowerment, which manifests itself in numerous societal challenges. People can form their ideals through empowerment.

As a theoretical framework and practical social work approach, empowerment helps us understand how and why individuals want to have a say in the choices that affect their livelihoods, housing, and overall well-being (Perkins & Zimmerman, 1995). There must be a clear distinction between empowerment theory and the empowerment method in terms of their impact on social transformation. To effectively execute change, effective assistance services outline specific aims, objectives, and plans. The ideas and structure provided by empowerment theory may help us expand our understanding of the topic. More than passing trends or pre-existing political regimes may benefit from the advancement of empowerment theory.

The theory of empowerment suggests methods for assessing empowerment in various settings, delves into the workings of motivation, and differentiates it from concepts like respect for identity, self-efficacy, and locus of control.

1.2 Women Empowerment

Empowerment of women refers to the condition in which women can achieve positions of independence and dignity in all areas of their lives. Only until women are free to alter their careers, lifestyles, and educational pursuits will they be able to empower themselves. According to World Vision Australia, empowering women can be defined as providing them with a sense of identity, autonomy to make choices, and the opportunity to effect change in their own lives and the lives of others.

Only when women are free to pursue other careers, further their education, and otherwise alter their lives will they truly be able to empower themselves. When

women are given the tools they need, they are better able to shape their values and take an active role in societal decision-making (Sen, Karmakar, and Adhikari, 2023b).

1.3 Self-efficacy

An individual's belief in their capacity to accomplish tasks, shaped by their past experiences, is referred to as self-efficacy. When it comes to self-efficacy, two key ideas are self-trust and internal empowerment. "Self-efficacy refers to an individual's belief in their ability to accomplish specific tasks (Bandura, 1977; Bertrams, 2016)". A student's belief in their abilities to carry out academic and extracurricular responsibilities is crucial to their success in the competitive Saudi university setting. Being able to regulate one's own responses, motivations, behaviours, and social surroundings is a sign of self-confidence (Bandura, 1994). Identifying women's potential performance in demanding and constantly changing professional environments, like universities, is dependent on their self-efficacy. Staff members, particularly educators, benefit from self-updates when they have high levels of self-esteem and self-efficacy (Grau, 2012). Women in the workforce who have faith in their abilities will be better equipped to handle job pressure and achieve their career objectives. "Women who lack confidence in their abilities, on the other hand, are more likely to fail miserably in work". Hence, they will not be able to come up with new ideas or even meet the barest standards associated with their career objectives. Such women will also experience low levels of self-esteem and empowerment. Because of their correlation, self-esteem and self-efficacy are complementary concepts. Simultaneously, the two ideas are fundamental to women's empowerment.

1.4 Evolution of Women's Education in India

In ancient India, women had the same rights as males to study the Vedas, and this included the right to participate in the sacred ceremony of Upanayana. Regrettably, they were unable to access it and, by extension, Vedic instruction, in subsequent eras

(Korishetti, 1994). In the third century B.C., when knowledge was mainly passed down orally, women in India began to receive formal instruction. Nalanda, Vikramshila, and Takshila were among the universities that employed women scholars at that time (Jenefa, 2012). Women were actively involved in the educational life of the universities founded in Delhi, Lucknow, and Allahabad by Muslim kings in the 11th century. The Mughal rulers ensured that princesses had access to a liberal education. "Among the educated women who served in the royal family were GulBadan Begum, Humayun Namah author and daughter of Babar; Nur Jahan, Jahangir's celebrated wife; Mumtaz Mahal, Shah Jahan's wife; Jahanara Begum, Shah Jahan's eldest daughter; and Zibunnisa Begum, Aurangzeb's eldest daughter (Korishetti, 1994)". During this time, literacy was achieved by the daughters of Rajput lords and a few Bengali zamindars. In the wake of British rule, a new era in India's educational history begins. As far as female education was concerned, the British made a ceremonial effort. Towards the beginning of the nineteenth century, during the British era, missionaries and their schools began to advocate for girls' education. Schools for females were established in 1819 by the non-religious Female Juvenile Society (Phadke, 1958, as cited in Korishetti, 1994). "With the support of Lady Amherst, who oversaw thirty women's schools, the Ladies Society for Native Female Education was established in 1824." A significant boost to women's education came from the creation of towns and the imposition of the local fund cess. "In the three presidencies of Bombay (now Mumbai), Calcutta (now Kolkata), and Madras (now Chennai), three universities were founded in 1857." Although middle-class ladies faced personal obstacles when trying to get degrees, more Christian and Parsi women than Hindu women participated (Jenefa, 2012). A pivotal figure in the fight for women's emancipation was the Indian National Congress. A Ladies' Association was established within one year after its establishment in 1885. Increased visibility of

women with advanced degrees in public life was a hallmark of the 1890s (Jenefa, 2012). "As time passed, more notable Indian women, such as Sarojini Naidu, Annie Besant, Rameshwari Nehru, Aruna Asif Ali, Sucheta Kriplani, Usha Mehta, and Vilasini Devi Shenai, became active in politics and society". The British government of India was compelled to formulate a new strategy on female education in 1913. This policy advocated for a specialised curriculum that would be useful for women, such as music and needlework (Korishetti, 1994). "New centres for women's emancipation emerged in 1916 at Banaras Hindu University, in 1920 at Aligarh Muslim University, and in 1922 at the University of Delhi. Higher education for women flourished after independence."

1.5 Women Empowerment through Education

To empower women, to grow, develop, and ensure their well-being, education is essential. Everywhere a woman goes, she faces prejudice, and that much is widely known. Women need to be empowered in all areas since they continue to face injustice and vulnerability across all industries. It takes more strength for women to swim against the system and battle against the socially imposed gender inequalities. The process of empowering oneself is the source of such strength, and education is the source of empowerment.

1.5.1 Education to Empower

An excessive amount of time and energy has been wasted on the phrase "empowerment" (Stromquist, 2002). As a synonym for enabling, participating, and speaking up, it is often used. We still do not fully understand how education empowers women, but the idea that it does has grown in popularity (Stromquist, 2002; DaCosta, 2008; Murphy-Graham, 2008).

Donors and international organisations have made women's empowerment (typically associated with women's education) a priority and a source of support (Unterhalter, 2007).

Regardless of its frequent misuse, there is consensus among scholars (Kabeer, 1999; Malhotra et al., 2002; Mosedale, 2005) that empowerment is: (a) an intricate process of overcoming disempowerment; (b) not something that can be handed down from on high because people are the ones doing the changing; and (c) influenced by and responsive to the environment in which women find themselves.

1.5.2 Power

"Power" is central to the meaning of empowerment. Hence, Karlberg (2005) employs feminist research that defines power as ability, along with prior work on the topic, to conceptualise empowerment. "In her commentary on the feminist theory of power, Hartstock (1983) explains how women's emphasis on power as capacity, rather than dominance, implies that women's relational experiences have greater implications for power understandings and may provide data for a more scientific approach".

Kabeer (1999) argues that women's empowerment occurs when women realise their value and strength inside, break down patriarchy, and join forces with men to achieve social and economic growth. "To achieve gender equality, women's empowerment is essential, but not sufficient, on its own". Part of achieving gender equality is that men and women should share tasks fairly and equally. Gender equality does not imply that men and women should perform identical tasks or be paid equally. On the contrary, it defines communities and partnerships where people are encouraged to work together towards a common goal, fostering an environment in which both sexes can flourish, according to Hooks (2000).

1.6 Dimensions of Empowerment of Women through Education

There are many ways in which education helps women gain independence. To put it another way, it provides women with the tools they need to choose their unique path to self-actualisation. How about we examine its many sides?

1.6.1 Participation in Public Affairs

Through education, women are empowered to engage actively in public affairs. The opportunity for women's economic and cultural engagement is guaranteed, alongside their civil and political rights, in this place. Knowledge is power, and it will empower people to stand up to exploitation in any form. Women must first become self-conscious before they can achieve political empowerment. They could use it to inform important choices in their private and public lives. "Their agency is bolstered by the freedom to vote, run for office, and participate in public policy campaigns. Additionally, it might lead to their involvement in community self-governance." A key goal of women's education was to provide them with the knowledge and skills necessary to take an active role in decision-making and policy-making processes that impact them and their interests (Akawa, 2014).

1.6.2 Social Upliftment

Education can also contribute to women's social advancement. It is a powerful tool for a nation's economic and social progress, and it is one of the main ways people may work together to alleviate poverty, ignorance, and marginalisation. "As a means to social change and democratic achievement, education must be valued for what it is: a foundation for a future that is professional, research-based, and career-oriented (Singh & Singh, 2017)". Some think it may help create a society where women are safe from violence of any kind, while others say it would guarantee that women are well-represented in positions of power. According to Varghese (2012), women can only be claimed to experience higher development and empowerment when their involvement

in decision-making processes allows them to gain more control over production variables, resource access, and benefit distribution. The education-empowerment narrative may benefit significantly from studies that examine how education influences women's attitudes, values, and outcomes (Aslam, 2013).

1.6.3 Financial Independence

Education boosts women's economic independence in addition to their social status. It improves their creditworthiness by ensuring they understand how to manage their finances. "According to Varghese (2012), women with a solid educational background tend to be particularly skilled at budgeting". For women to fight for equality and justice, they must be financially self-sufficient. Without it, they will be unable to stand up for what is rightfully theirs. People cannot be free to act responsibly in society and make acceptable decisions when they do not have a reliable source of income (Varghese, 2012). Women who have achieved financial literacy are better able to organise their families', communities', and even their nation's budgets. A woman's economic power may be measured by her influence, accomplishments, and control over her resources. Another factor that determines women's financial independence is their access to micro-finance services. It could also help increase their buying power. The advancement of women's education has a long history of being seen as very revolutionary and dangerous. Education is often linked to notions of a "modern," or Westernised, way of life and a means to a formal job in most civilisations throughout the globe (Sweetman, 2004).

1.6.4 Psychological Empowerment

People might be mentally empowered to handle their difficulties via education. A sense of self-worth and belief in one's abilities is fundamental to psychological empowerment. In addition to breaking societal norms and established gender roles, women who practise psychological empowerment change their identities and

subjectivities (Mandal, 2013). As a result, women can lessen their feelings of atomisation, fragmentation, and isolation and instead gather together. "Women gain psychological power, self-confidence, self-worth, and control over their income and bodies when they participate in educational institutions, political parties, or decision-making bodies; when they hold white-collar jobs, make decisions, travel, and own land and wealth (Mandal, 2013)". As they have grown and explored on their own, they have gained dignity, pride, maturity, and the ability to bounce back from setbacks, all of which have helped them assert their independence from home. The skill of surviving and adapting to new conditions is also a valuable lesson they learn. There may be a ceiling on the number of children a woman can have, as educated women tend to have a lower desire for additional children.

1.6.5 Political Growth

Women are more politically empowered when they have access to education. For women to be truly empowered there is an urgent need for their involvement in all tiers of government. "According to Alida Brill (2000), when people's voices are not heard in government and public policy discussions, they are denied the right to be held accountable, a fundamental principle of governance (Mandal, 2013); All around the globe, women have been fighting for freedom from enslavement, tyranny, subordination, and other forms of mistreatment, whether inside or outside of their homes". Women often struggle to survive unless they are given a voice in policymaking and program implementation at the highest levels of government (Mandal, 2013). A woman's confidence and ability to face her concerns are both bolstered by an education. "A woman's empowerment in reality is to empower herself and not overpower men," (Promilla Kapur, 2001) (Mandal, 2013) correctly states. This is one way in which women's political empowerment liberates them from oppression. "As a result of taking action on problems that they personally and

collectively deem essential, individuals are empowered to make a difference in their own lives, as well as those of their neighbours and the larger community (Mandal, 2013)". Developing one's strength and power is a multi-stage process. A robust democratic society may be unimaginable without women's equal involvement. To guarantee better living circumstances, involvement is crucial.

1.7 Research Objectives

1. To examine the impact of gender-inclusive curricula on adolescent girls' self-efficacy and career aspirations in secondary schools.

2. To investigate the role of teacher support and mentorship in fostering confidence and academic performance among adolescent girls.

3. To assess the effectiveness of extracurricular programs, such as STEM workshops and leadership initiatives, in enhancing girls' self-efficacy and goal-setting behaviours.

4. To identify barriers to girls' education, including socioeconomic and cultural factors, and evaluate school-based interventions aimed at overcoming these challenges.

1.8 Research Hypotheses

1. A gender-inclusive curriculum that highlights female role models significantly enhances the self-efficacy of adolescent girls and broadens their career aspirations compared to a standard curriculum.

2. Active teacher support and mentorship positively correlate with higher levels of confidence and academic performance among adolescent girls in secondary schools.

3. Participation in extracurricular programs, such as STEM workshops and leadership initiatives, significantly increases adolescent girls' self-efficacy and goal-setting behaviours.

4. School-based interventions that address socioeconomic and cultural barriers significantly reduce dropout rates and enhance the educational aspirations of adolescent girls.

1.9 Scope of the Study

This research examines the impact of secondary schools on the self-efficacy and aspirations of teenage girls, focusing on educational interventions that promote empowerment. A variety of extracurricular activities (such as STEM workshops and leadership efforts) and school-based techniques to overcome socioeconomic and cultural obstacles are discussed, as are gender-inclusive curriculum and mentoring programs for teachers. This study focuses on adolescent girls from diverse socioeconomic backgrounds and locations (12–18 years old) attending secondary schools in both urban and rural areas. No information on informal learning environments or higher education is included in the research since it only covers official educational settings. Focusing on quantifiable outcomes, such as self-efficacy ratings and career desire trends, data gathering will include surveys, interviews, and case studies of selected institutions. Only when these extraneous variables interact with treatments implemented in schools will they be taken into account, such as family dynamics and community effects.

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CHAPTER 2:

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A STUDY ON THE TRANSFORMATIVE ROLE OF CORPORATE SOCIAL RESPONSIBILITY IN SHAPING POSITIVE EMPLOYEE VIEWS OF BRAND REPUTATION AND ADVANCING FINANCIAL PERFORMANCE

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ABSTRACT: Lately, there has been a rise in both theoretical and practical research on corporate social responsibility (CSR), especially pertaining to its influence on organizational processes, employee attitudes, and the business as a whole. With the evolving landscape of global markets and heightened demand for transparency and accountability, CSR has shifted from being a sideline activity to a central component of corporate strategy. While the literature highlights the pivotal role of CSR in shaping consumer behavior and enhancing corporate image, this sparse empirical research examining indirect impacts, especially through socal capital and brand value, in chronically business performance metrics remains remarkable. In this case, the objective of this study is to analyze the influence of CSR activities on internal employees regarding corporate reputation perception and financial outcomes. Within an organizational context, employees may be considered as internal stakeholders who have a vital role in the understanding and implementation of CSR practices. The social and ethical behavior of an organization has far reaching consequences on an individual's perception of and relationship with the brand and therefore in influencing

productivity, loyalty, and advocacy for the firm. The utilization of this research indicates that employees are more likely to develop a strong emotional connection with the brand if their company is perceived as socially responsible and operates within the boundaries of ethical principles. When the conduct of employees at the company is aligned with the company's values, this fosters internal positive branding, enhances morale, and drives organization-congruent behaviors. These processes are critical in determining the external brand image of the firm.

Furthermore, this research also analyzes the indirect impact of CSR spending on important financial metrics such as return on assets (ROA) and market capitalization. It has been observed that the influence of csr activities on these financial indicators is greater in the presence of strong brand equity coupled with social capital, which serve as moderating variables. Particularly, brand equity in the context of CSR serves as an indicator of sustained performance reflecting enduring commitment and ethical management of the firm. At the same time, social capital, defined as trust, ties, and engagement of the public, increases the favorable impact resulting from csr activities.

Keywords: corporate social responsibility; brand; brand value; financial indicators; Return on assets; return on equity; market capitalization

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2: INTRODUCTION

The importance of CSR, or corporate social responsibility, has been increasingly recognised in recent years (Stojanović, 2021). Companies must prioritise CSR if they want to succeed in today's cutthroat business environments (Wang, 2021). In order to get an edge over competitors, each brand might enhance its CSR initiatives (Mahmood, 2020). Nevertheless, there is a lack of data on how CSR impacts various parts of organisations (Mahmood, 2020). The economic, ethical, environmental, and social dimensions of corporate social

responsibility (CSR) must be addressed if businesses are genuinely committed to sustainable development. Consequently, for green development to occur, companies must adopt the proper stance and accurately evaluate the situation, enabling them to provide solutions that highlight their contribution to environmental conservation.

It is well known that human exploitation of natural resources leads to environmental degradation on a global scale, affecting both densely populated and less populated regions (Campos, 2021). Environmental corporate social responsibility (CSR), developing a "green" brand identity, and gaining a "green" competitive edge are becoming primary concerns for business researchers worldwide (Alam, 2021). Corporate social responsibility (CSR) is an approach to self-regulation by businesses that aims to promote economic growth while addressing social and environmental issues. Additionally, future biorefineries will extensively utilise such methods, and green production strategies that combine food waste with other sustainable manufacturing processes will also be crucial (Sinha, 2021). "Manufacturing environmentally friendly products is essential for companies that want to reduce their environmental impact and promote sustainability within their community."

Corporate social responsibility (CSR) and financial success are closely intertwined (Saeidi, 2015). Customers' confidence in a firm may be enhanced when they can comprehend the firm's CSR activities, especially when assessments of knowledge and integrity are promoted. Consequently, businesses can expect improved financial returns from their CSR initiatives as they enhance the value of their brands. Said that CSR program involvement raises organisational awareness, which in turn affects employee engagement and business outcomes. To expand sustainably over the long term, businesses should engage in CSR and other explicitly defined social responsibility initiatives.

According to K'adekova (2020), it is now essential for companies to incorporate CSR into their strategy. Due to this knowledge gap, the current research aims to investigate the impact of CSR on brand equity and reputation. Businesses may strengthen their brand reputations over time with the help of CSR initiatives. One aspect of a company's brand value is its reputation for ethical behaviour, which includes how it treats its stakeholders fairly when allocating resources. "Consequently, customer knowledge of corporate social responsibility initiatives may have a substantial impact on brand value (Kadekova, 2020)." Developed nations have been the primary settings for the majority of research on corporate social responsibility (CSR), consumer loyalty, business reputation, and organisational performance (Ali, 2020). Consequently, their findings do not apply universally to underdeveloped nations. There are two leading causes. For starters, CSR activity outcomes cannot be directly compared between states due to fundamental differences in infrastructure, resources, laws, and levels of knowledge between developed and poor nations. Secondly, it is not wise to generalise results from rich nations to the developing nation setting, as CSR is defined and used differently in various contexts. "Vietnam is a developing nation that requires more research on the impact of corporate social responsibility (CSR) on company brand reputation in order to reorganise its performance management system". All of an organisation's goals depend on performance management. Corporate social responsibility (CSR) is crucial to the success of corporate branding in today's world.

2.1 Brief History of Branding

Dating back to approximately 2000 BC, the original purpose of branding was to indicate ownership. Farmers would use branding irons to identify their cattle from other animals, and artists would use insignia to identify the origin of their work. However, branding has evolved into a way for companies to market themselves and establish trust with prospective customers (Bastos & Levy, 2012).

The concept of branding predates the term's use in modern marketing jargon. According to Room (1998), it has its origins in long-gone cultures. Advertising wines, ointments, pots, and metals was a common practice among the ancient Greeks and Romans, as well as those who came before them. Inscriptions would notify the public that a particular individual at a specific location could create shoes, and that the man who lived there was a scribe (Petty, 2016). Town criers were also used by the Greeks to proclaim the arrival of ships carrying certain cargoes. Distillers had their unique branding strategy in the 1600s. To distinguish between whiskeys made by different distillers, they would burn or imprint their name on wooden vessels known as kegs or barrels. According to Wetzels et al. (2009), the idea of a brand continued to develop throughout the 17th and 18th centuries. Products were formerly identifiable by their manufacturers' names. It functioned as an umbrella brand for the company. The producer's identity was formerly embodied in the brand name. Vehicles manufactured by Ford, for example, prominently feature the name of the company's founder, Henry Ford (Bronnenberg et al., 2009).

Midway through the twentieth century was when branding took off. There was a clear shift toward mass manufacturing and standardisation as the new industrial revolution transformed production practices (Thakor, 1996). As a consequence, one product became almost identical to all its competitors. You could not tell one kind of detergent, soap, tea, coffee, chocolate, or cookie from another. As a result, manufacturers became obsessed with branding. They resorted to using a trademark to distinguish their products and assure customers of their constant high quality.

2.2 Definition of a Brand

One way to set your wares apart from the competition is to establish a memorable brand name—the use of brands dates back to ancient times. The actual act of branding cattle to

identify its owner is rooted in the Old Norse word "brand," meaning "to burn," and the term derives from this origin. Many modern products, services, people, locations, ideas, and concepts utilise branding to differentiate themselves from competitors. Solomon and Stuart define a brand as "a name, a term, a symbol, or any other unique aspect of a product that identifies one firm's products and sets them apart from the competition" (2002). The term "brand" may be defined as "... a unique name and symbol (such as a logo, trademark, or packaging design) created to distinguish the products or services of one vendor from those of a group of sellers or from those of competitors" (Aaker, 2009). "By the American Marketing Association, a brand may include a mix of words, phrases, marks, signs, symbols, designs, or any one of these things. Its purpose is to highlight a seller's or group's goods or services so that they stand out from the offerings of rival companies (Armstrong & Kotler, 2010)".

2.3 Corporate Social Responsibility (CSR)

Businesses worldwide are increasingly focused on the concept of Corporate Social Responsibility, a concept that has evolved. A company's social and environmental impacts should be considered alongside its financial ones as part of its corporate social responsibility (CSR) efforts. Central components of corporate social responsibility include: a. Honesty in Business: Corporate social responsibility requires companies to conduct their business in an honest and forthright manner. This includes being truthful in advertising and dealings with customers, adhering to fair labour practices, and sourcing products ethically. a. Environmental Stewardship: Businesses are being held more and more responsible for the damage they do to the environment. Implementing sustainable practices, preserving resources, and lowering carbon emissions are all part of corporate social responsibility activities. d. Involvement in the Community: Corporate social responsibility (CSR) promotes a company's involvement in the communities it serves. Charity work, community service, and other similar endeavours fall under this category. d. Stakeholder Accountability: Going

beyond only shareholders, companies are required to hold themselves to a higher standard when it comes to their workers, customers, suppliers, and the broader community. "Corporate social responsibility (CSR) has recently emerged as a tool for businesses to enhance their reputation, attract and retain talented employees, and engage with individuals who care about social issues". Compliance with regulations is only the beginning; it can also lead to a competitive advantage in the marketplace and long-term sustainability (Kim et al., 1993).

2.4 The Role of Brand Building

Marketing treatises have used the word "brand" for quite some time, albeit in a different context. The term "brand" was first used by Aaker (1991) to describe a unique way that products or services offered by a company or group of companies might be identified and differentiated from competing offerings. Thus, a brand not only protects the consumer and the manufacturer against imitators, but also indicates to the buyer where the goods came from. In commercially sustainable circumstances, a brand can be both visible and invisible; it can be both functional and symbolic (Kapferer, 2002). In today's cutthroat business environment, it takes more than just coming up with a name or logo to make a brand successful. Making a name for yourself in today's highly competitive digital market is no easy feat. Building a reputation for oneself is not enough; a brand must also prove its worth. It is an ever-changing procedure that incorporates several components of the present marketing mix. Titan is an excellent example of this kind of brand. The company's brand value was built up thanks to the wide range of timepieces it provides, together with its excellent shopping experience, solid partnerships, and the promotion and creation of multiple price points. Consequently, regardless of the marketing approaches employed, the primary goal of any firm should be to establish its brand and subsequently enhance its value.

2.5 CSR and Sustainability

The Brundtland Commission defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This concept is used by corporate sustainability. When businesses strive to achieve sustainable development objectives, they are engaging in corporate sustainability, a framework that encompasses social progress, economic growth, and environmental stewardship simultaneously. Corporate social responsibility (CSR) in India is concerned with the actions taken after gathering financial gains. "On the other hand, sustainability is about considering the social and environmental impacts of a company's actions, as well as the way revenues are generated." In India, CSR is primarily focused on sustainability and corporate responsibility, encompassing a broader concept that is reflected in various sustainability models (Borowy, 2013).

As an interesting example, consider the "Ministry of Corporate Affairs in June 2011" NVGs, which address the environmental, economic, and social responsibilities of firms. Enacted in 2013, the Companies Act's CSR provision encompasses most of the components covered in the concept of inclusive development. In contrast, the other eight regulations address different parts of the business. The United Nations Global Compact is a widely recognised framework for sustainability that encompasses ten principles addressing key topics such as human rights and environmental protection. Instead of being stated outright, CSR principles are inferred. The many CSR definitions proposed by international organisations demonstrate the growing convergence of CSR and sustainability on a global scale. Stakeholders and their potential integration with the company's ESG, SDG, and economic objectives are included in newly released draft recommendations about a CSR section in the Companies Act, 2013. It is also part of the DPE's April 2013 "Guidelines on CSR and Sustainability for Central Public Sector Enterprises" (Guidelines). The following are some of the new suggestions that have

replaced two previous CSR and sustainable development plans from 2010 and 2011, respectively: "Since corporate social responsibility and sustainability are so closely entwined, it can be said that corporate social responsibility and sustainability is a company's commitment to its stakeholders to conduct business in an economically, socially, and environmentally sustainable manner that is transparent and ethical."

2.6 Benefits of a robust CSR program

Given the complexity of today's business climate and the high expectations of stakeholders, the benefits of effective CSR can only grow in the future (Porter & Kramer, 2006):

- Communities give businesses the green light to operate: Governments (by rules and regulations), investors, and customers are among the key stakeholders who influence business actions, alongside internal motivators like ideals and ethos. The 'license to operate' is no longer granted solely by governments; instead, it is bestowed by the communities affected by a firm's commercial operations. This realisation has dawned on many firms in India, a societal stakeholder that ranks fourth and is very crucial. Corporate social responsibility (CSR) initiatives that prioritise local needs have the potential to reduce this "trust deficit," enabling them to continue operations while preserving their rights.

- Attracting and retaining employees: CSR commitments have been linked to an organisation's ability to attract, retain, and motivate employees, according to several HR studies. Helping employees feel like they belong at work may have a positive effect on their mental health, according to research.

- Communities as suppliers: Companies are working to improve people's livelihoods by incorporating them into their supply chain, and they are also launching new corporate

social responsibility initiatives. As a result, local communities have experienced increased revenue and improved stability in their supply chains.

- Enhancing corporate reputation: Companies that successfully implement CSR initiatives continue to reap the traditional benefits of building goodwill, a positive image, and branding, all of which contribute to an improved company reputation. This helps businesses present themselves as upstanding members of society.

2.7 Internal and External CSR Activities

According to Farooq et al. (2014), socially responsible businesses engage in both internal and external initiatives. According to Hameed et al. (2016), this categorisation is based on two key aspects: internal CSR activities related to workers, and perceived external CSR initiatives aimed at satisfying the expectations of external stakeholders. Investing in human capital, education, health and safety, general skill enhancement, change management, and other employee-centred initiatives are examples of socially responsible practices within the organisation (Mijatovic et al., 2015). Additionally, CSR includes the active monitoring of workers who are unable to work due to job-related injuries or disabilities (Rusmanto & Williams, 2015). Nondiscriminatory policies and procedures that help hire people from underrepresented groups, such as minorities, the elderly, women, the long-term jobless, and those with disabilities, are part of responsible employment practices. Together, they help bring about the reduction of unemployment and the fight against social exclusion that are outlined in the European Employment Strategy.

Corporate social responsibility (CSR) initiatives should not just target internal operations, but also the communities served by external CSR initiatives. Businesses in every industry are feeling the pressure from customers and other stakeholders who want them to do things differently. "According to González-Rodríguez et al (2015) and González-Rodríguez and Díaz-Fernández (2020), managers are increasingly concerned about the crucial elements

necessary for a company's growth and survival due to the on-going pressure from numerous stakeholders within enterprises and society at large". For a socially responsible business to be truly effective it must extend its reach beyond the company's employees and customers; it must also engage with local communities, stakeholders, suppliers, consumers, government agencies, and non-governmental organisations (NGOs) in the region. Businesses contribute to their communities in various ways, including providing employment opportunities, paying taxes, donating to non-profit organisations, sponsoring events, running socially responsible advertisements, and utilising corporate resources. As Kim et al. (2018) point out, investing in the community where the company operates and ensuring employee satisfaction will not harm the bottom line. Instead, it will help the company grow overall and benefit those who truly need it. Studies often find direct correlations between CSR initiatives and staff engagement (Turker, 2009; Lee et al., 2013; Appiah, 2019). On the other hand, a research study by Hameed et al. (2016) suggested that CSR efforts, whether focused internally or externally, are a key factor in establishing such relationships indirectly. The findings support this divide, since they show that internal and external CSR activities have different effects on workers' sense of belonging to the firm and their level of engagement with such activities (Hur et al., 2019).

2.8 Research Objectives

1. To examine the influence of corporate social responsibility (CSR) initiatives on employees' perceptions of brand reputation across different industries and organizational contexts.

2. To investigate the mediating role of organizational culture and leadership styles in shaping the relationship between CSR activities and positive employee views of brand reputation.

3. To assess the impact of CSR on financial performance through enhanced corporate reputation, brand equity, and stakeholder trust.

4. To explore the moderating effects of industry type, cultural context, and stakeholder awareness on the relationship between CSR, brand reputation, and financial outcomes.

5. To identify strategic approaches for implementing authentic CSR initiatives those maximize employee engagement and contribute to long-term financial sustainability.

2.9 Research Hypotheses

1. **H1**: Corporate social responsibility (CSR) initiatives have a significant positive effect on employees' perceptions of brand reputation across various industries.

2. **H2**: Organizational culture mediates the relationship between CSR initiatives and employees' positive perceptions of brand reputation.

3. **H3**: Ethical leadership moderates the relationship between CSR initiatives and enhanced brand reputation among employees.

4. **H4**: CSR activities positively influence financial performance through the mediating effect of improved corporate reputation and brand equity.

5. **H5**: The impact of CSR on brand reputation and financial performance varies significantly across different industry types and cultural contexts.

6. **H6**: Higher stakeholder awareness of CSR initiatives strengthens the positive relationship between CSR, employee perceptions of brand reputation, and financial outcomes.

2.10 Scope of the Study

This study focuses on examining the transformative role of corporate social responsibility (CSR) in shaping employees' perceptions of brand reputation and its impact on financial performance. The scope is defined as follows:

1. **Geographical Scope**: The study encompasses organizations operating in both developed and developing economies, with a particular emphasis on regions such as Asia (e.g., Vietnam, Pakistan) and Europe, to capture diverse cultural and economic contexts influencing CSR outcomes.

2. **Industry Scope**: The research includes multiple industries, such as hospitality, banking, fast-food, and small- and medium-sized enterprises (SMEs), to analyze variations in CSR's impact across sectors.

3. **Organizational Scope**: The study covers organizations of varying sizes, including SMEs and multinational corporations, to assess how CSR initiatives influence brand reputation and financial performance in different organizational structures.

4. **Stakeholder Focus**: The primary focus is on employees as key stakeholders, exploring their perceptions of brand reputation, with secondary consideration of external stakeholders (e.g., customers, communities) to understand their role in mediating financial outcomes.

5. **Conceptual Scope**: The study investigates the relationships between CSR initiatives, organizational culture, leadership styles, brand reputation, brand equity, and financial performance, emphasizing mediating and moderating factors such as stakeholder awareness and industry context.

6. **Methodological Scope**: The research relies on a combination of quantitative and qualitative approaches, including surveys, case studies, and secondary data analysis from existing literature, to validate hypotheses and derive insights.

7. **Temporal Scope**: The study considers contemporary CSR practices and their impacts based on data and trends observed up to July 2025, ensuring relevance to current business environments.

The study excludes non-commercial entities and CSR initiatives unrelated to employee perceptions or financial performance, focusing solely on for-profit organizations with active CSR programs.

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Chapter 3:

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NAVIGATING THROUGH THE OUTLANDISH POST HERNIA MESH REPAIR - THE "GREY ZONE" LYMPHOMA

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Abstract: Grey Zone Lymphoma (GZL) is defined as a B-cell lymphoma that displays characteristics between the classical Hodgkin's lymphoma (cHL) and diffuse large B-cell lymphoma (DLBCL) . It is a significant challenge for hematopathologists for diagnosis of GZL. In 2008, the World Health Organization (WHO) officially identified GZL as a provisional category for cases exhibiting both morphological and immunophenotypic qualities of these two lymphoma subtypes. GZL most often presents as enlarged mediastinal lymph nodes and typically affects young adults with tumors in the anterior mediastinum. There has been reports in literature about Cutaneous B-cell lymphomas associated with synthetic mesh implants however the occurrence of GZL at the groin site after hernia mesh surgery hasn't been previously described, marking an uncharted territory of medicine. **Case Presentation**: A 65-year-old male presented to us who developed a groin mass and an associated lower limb swelling. This occurred a decade after he underwent laparoscopic inguinal hernia mesh repair at the same site. An initial computed tomography (CT) scan revealed a soft tissue mass that appeared to infiltrate surrounding structures, raising suspicion of a soft tissue tumor. A trucut biopsy of the mass yielded a perplexing result: angiolymphoid

hyperplasia. Given this ambiguity, an open biopsy under anesthesia was performed. Subsequently a histopathology followed by a immunohistochemistry (IHC) ultimately led to the diagnosis as a B-cell lymphoma with features intermediate between Hodgkin's and EBV-positive Non-Hodgkin's Lymphoma. **Results:** After getting a positron emission tomography (PET) CT scan for staging and a bone marrow biopsy, the patient was classified as a Stage IIIA GZL. It was decided to go ahead with six cycles of R-CHOP chemotherapy (rituximab, cyclophosphamide, doxorubicin, vincristine, prednisolone)-the most commonly referred regimen, which led to improvement of patient symptoms. A follow up PET CT was done at the completion of therapy which had shown complete response to treatment. **Conclusion:** This case highlights the fact that Grey Zone Lymphoma (GZL) has a possibility of presenting with widely varying morphological characteristics thus making extensive and thorough tissue sampling extremely important for correct identification. Given the uncommon nature of this disease, initial diagnostic assessments may sometimes be inaccurate. Our findings had shown that while performing an open biopsy without solely relying on a core needle biopsy may provide a more reliable diagnosis in difficult to diagnose situations. Additionally, even though implant related lymphomas have mostly been documented in breast cases, the appearance of a Grey Zone Lymphoma at hernia mesh site in our patient represents a novel finding. Our case report also highlights the successful treatment of Stage III DLBCL-like GZL using R-CHOP chemotherapy protocol

Keywords: Grey Zone Lymphoma, Cell, Implant, Case Study, Tissue

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3.1 Introduction

Grey Zone Lymphoma (GZL) is a very rare and diagnostically complex lymphoma. It shares an overlapping feature between both classical Hodgkin lymphoma (cHL) and diffuse large B-cell lymphoma (DLBCL). It was identified for the first time in 2005 and officially classified by the World Health Organization in 2008, however GZL continues to pose diagnostic challenges, even with improvements in identification techniques. Breast Implant-Associated Anaplastic Large Cell Lymphoma (BIA-ALCL) is a T-cell lymphoma that has been connected to breast implants, often presenting or misdiagnosed as a seroma or a mass and is potentially linked to an ongoing inflammation, genetic predisposition, or the presence of bacterial biofilms but there has been no such reports of lymphoma associated with the use of prolene mesh used in inguinal hernia repair.

Lymphomas found in the inguinal area are particularly rare and are sometimes discovered by chance during surgeries for hernia repair, typically appearing as painless swellings in the groin. Primary lymphomas of the spermatic cord can be especially challenging to diagnose as they may imitate hernias. To date, no documented cases exist showing the development of lymphoma, including GZL, in connection with inguinal mesh implants, nor have cases of GZL been specifically reported in this region.

Polypropylene mesh is commonly used in surgical repairs for its durability and inertness and may also be used to reinforce tissue after removal of lymph nodes in certain surgeries. The body's response to mesh may differ depending on factors like age, diabetes, autoimmune diseases, type of hernia and most importantly the method of surgery. It is worth to note that there have been instances of lymphoma associated with Prolene mesh, however such cases may be mistaken for meshoma. However, unlike typical meshomas, these lymphomas do not involve common infectious agents like Staphylococcus aureus, thus pointing towards a unique, non-infectious underlying cause.

This report thus describes one such rare occurrence of a lymphoma developing at the site of Prolene mesh implantation site.

3.2 Case Report

A 65-year-old diabetic male presented with a history of laparoscopic left inguinal hernia mesh repair (TEPP) performed 10 years before. He presented with a month-long history of bilateral lower limb swelling, more prominent on the left. The patient reported no associated pain, recent trauma, or visible engorged veins.

Initial Presentation and Examination

On physical examination we noted bilateral lower limb edema, significantly more on the left side. Incidentally we found a firm to hard, irregular and immobile mass, approximately 10x10 cm size , located in the left inguinal region. Other than the following the rest of the abdominal examination did not reveal anything remarkable. There was no evidence of generalized lymphadenopathy. Routine hematological investigations were within normal limits.

Diagnostic Imaging and Initial Biopsy Findings

A CT scan of the abdomen and pelvis had revealed a soft tissue mass which was located deep in the inguinal region with a significant infiltration along with occlusion of the left external iliac vein. The mass had also demonstrated infiltration into the muscles and fascia of the anterior abdominal wall and also the pelvic floor. Additionally to this multiple discretely

enlarged lymph nodes were observed in the left para-aortic, iliac, and inguinal regions. The provisional diagnosis that was considered was either a soft tissue tumor or a conglomerated lymph node mass.

A trucut biopsy taken from the inguinal mass initially indicated eosinophilia in background of Angiolymphoid Hyperplasia. Further immunohistochemistry (IHC) suggested a B-cell lymphoproliferative disorder that was unclassifiable. The obtained tissue was positive for CD20, CD3, and also MUM1. Also the presence of Reed-Sternberg-like cells expressing CD30, CD15, and PAX5 was noted in the biopsy specimen, hence overall features presented was characteristic that was intermediate between Hodgkin's Lymphoma and EBV-positive Non-Hodgkin's Lymphoma along with a Ki67 proliferation index of 15%.

Open Biopsy and Definitive Diagnosis

With the initial ambiguity in diagnosis with pathological findings, open incision biopsy was performed for the patient. Exploration of the mass was done under anesthesia through a 6cm transverse incision over the inguinal region which revealed a hard as well as a fixed mass originating from the retro peritoneum which was extensively infiltrating the major vessels. These findings had corroborated with the CT scan, confirming that the mass had extension to the anterior abdominal wall with muscle infiltration. It was also worth to note that the previously implanted hernia mesh was found to be entirely incorporated within the tumor mass.

Two substantial pieces of the mass were excised for histopathological examination. The subsequent report confirmed features consistent with a lymphoproliferative disorder. Immunohistochemistry on the excised tissue further clarified the diagnosis: large cells were positive for CD20, reactive small cells were positive for CD3, and histiocytes expressed CD68. The Reed-Sternberg like looking cells consistently expressed BCL6, CD15, CD30, MUM1 and PAX5. The final pathology report confirmed an Unclassifiable Lymphoma with features intermediate between Diffuse Large B-cell Lymphoma (DLBCL) and Hodgkin's Lymphoma.

Staging and Treatment

Following this confusing biopsy report, the patient was referred to a medical oncologist. A staging PET-CT scan was performed, which identified a large, heterogeneously enhancing, and FDG-avid soft tissue mass involving the left external iliac and deep inguinal regions. This mass caused medial displacement of the urinary bladder, anteriorly abutted the left rectus abdominis with ill-defined fat planes, and encased the left external iliac vessels. There

was also a few prominent FDG-avid lymph nodes observed in the mediastinum. A bone marrow biopsy was done which showed no involvement, hence leading to the final diagnosis of Stage IIIA lymphoma.

The patient was started on chemotherapy with R-CHOP (Rituximab, Cyclophosphamide, Hydroxydaunorubicin, Oncovin (Vincristine), Prednisone). After three cycles, a re-evaluation was done with a PET-CT which showed a partial response, thus prompting the completion of the three additional cycles of R-CHOP. A repeat PET scan was done at 6 months follow-up which demonstrated complete resolution of the disease.

3.3 Discussion

Gray Zone Lymphoma (GZL) is one of the most diagnostically complex and fascinating sub type of B-cell lymphomas. It is infrequently encountered. It sits uniquely within the lymphoma classification system and exhibits features that overlap with both classical Hodgkin lymphoma (cHL) and diffuse large B-cell lymphoma (DLBCL). The progress of how we understood the pathophysiology of GZL—from initially identifying it through the current concept of our present understanding illustrates the dynamic progress of haematology and pathology and a continual advancement in how lymphomas are classified.

Evolving Classification and Historical Perspective

GZL has undergone notable changes in definition ever since it was first acknowledged as a distinct entity in the late 1990s, The initial documentation in 1998 catalyzed further research by 2005, as more cases with its distinctive hybrid traits were described. This attention resulted in the World Health Organization (WHO) formally introducing GZL as a provisional category in its 2008 classification, meant for cancers sharing morphological and immunophenotypic aspects of both primary lymphoma types.

The 2022 WHO classification has slightly modified the definition of a GZL. The update of the definition has restrictee GZL to primarily tumors arising in the mediastinum, which is now designated as Mediastinal Gray Zone Lymphoma (MGZL). This revision specifically highlights the predilection of the tumor to arise in the mediastinum and its close relationships to nodular sclerosis subtype of cHL and primary mediastinal B-cell lymphoma. Former non-mediastinal GZL cases are now generally reclassified as DLBCL, not otherwise specified (DLBCL, NOS), as these are believed to reflect different pathological pathways.

Epidemiology and Clinical Features

GZL is extremely rare, with only a few epidemiologic data mainly due to the disease's rarity. A 2019 study by Qasrawi et al. had laid some insight and estimated the age-adjusted

incidence of GZL at just 0.53 cases per million people annually (that is between 2005 and 2016), thus highlighting that it is considerably difficulty in conducting large-scale clinical trials.

MGZL is most commonly diagnosed in young adults and has a mild male predominance (male:female ratio ~1.4:1), thus differing from the female predominance in both cHL and primary mediastinal B-cell lymphoma. Its average age at diagnosis is typically between 32 and 37 years, parallel to incidence trends seen in cHL and PMBL. Clinically, often patients will present with a mass in the anterior mediastinum, and some patients experience symptoms from the chest structures being compressed, with about one in four developing superior vena cava syndrome.

Diagnostic Hurdles in Pathology

Diagnosing a GZL does present significant challenges, as it occupies a immunophenotypic and morphological intermediary position between cHL and DLBCL. A Biopsy may reveal a large and varied type of cells similar to Reed–Sternberg cells as seen in cHL along with atypical sheets of B-cells that is more characteristic of DLBCL.

The notable variability in GZL's tissue architecture demands extensive sampling for proper identification. Neoplastic cells frequently show greater fluctuation in nuclear size and shape than standard Hodgkin Reed–Sternberg cells, and exhibit less frequent eosinophilic nucleoli. Characteristically, tumor cells often cluster in dense sheets, within a background containing relatively few inflammatory elements, although some eosinophils, histiocytes, and lymphocytes may still be present.

GZL's immunohistochemical findings are also intricate and variable. Diagnostic workups typically include stains for CD20, PAX5, MUM1, CD30, CD15, and Epstein–Barr virus. The majority of GZL cases show strong positivity for CD20 (~81%), nearly universal and robust MUM1 staining (~96%), CD30 expression in most cases (~92%), and CD15 positivity in a little less than half (~42%).

Molecular Genetical Features

Advancements in the world of molecular biology and testing has given a proper place to the identity of GZL. Gene expression studies indicate that MGZL possesses a unique epigenetic signature intermediate between cHL and primary mediastinal large B-cell lymphoma, but distinctly different from conventional DLBCL. Genes like HOXA5, MMP9, EPHA7, and DAPK1 have enabled the creation of accurate diagnostic prediction models to differentiate between these closely related malignancies.

Chromosomal modifications are commonly detected in this entity, especially copy with number gains in regions 9p24.1 and 2p16.1. Approximately one in three cases have gains at 2p16.1, while more than half show modifications at 9p24.1, JAK2, PDL1 and PDL2—mirroring similar findings to a primary mediastinal large B-cell lymphoma and thus pointing to a possible common source of origin.

Treatment and Prognosis

Due to the rarity of the disease there are no standard in the treatment guidelines for Grey Zone Lymphoma and hence oncologists often rely on regimens used for DLBCL or a cHL. Evidence frequently suggests that a GZL responds really well to chemotherapeutic regimens based on those for DLBCL, With special addition of rituximab to management protocol.

The R-CHOP regimen (rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone) is a common first-line option often used in management. Studies have shown uite often a higher response rate with R-CHOP, including few reports where there has been complete remission thus achieving 100% in a small patient group along with a median progression-free survival of 11.4 months thus indicating a better outcome than with alternative regimens.

Other successful therapies include DA-EPOCH-R (dose-adjusted etoposide, prednisone, vincristine, cyclophosphamide, doxorubicin, and rituximab), which has shown 62% event-free and 74% overall survival at 59 months in a study of 24 patients, though these rates are slightly lower than those seen in primary mediastinal B-cell lymphoma treated similarly.

New Findings in Association with Implants

Recently, rare cases of GZL developing at artificial implant sites have been described. The link between synthetic materials and lymphoma—already recognized in the context of breast implant-associated anaplastic large cell lymphoma (BIA-ALCL)—is now being explored in relation to GZL. The underlying cause that most likely is involved is persistent inflammation that is caused by a foreign object, a continuous antigenic stimulation along with modification of the tissue micro-environment.

Polypropylene meshes that are used for hernia repairs have been shown to prompt a long-standing inflammation mediated by a monocyte-derived macrophage which has a high inflammatory activity. This state of a continuous state of inflammation may lead to genetic instability, may interfere with normal B-cell maturation and may block the immune surveillance and thus possibly facilitating primary cancerous changes.

Research has indicated that after mesh placement, inflammatory reactions persist for a long time, evolving from acute to chronic, with the participation of monocytes, lymphocytes, and multinucleated giant cells. This persistent inflammation results in increased systemic markers of inflammation like interleukin-6 and CRP.

The phenomenon of prolonged antigenic stimulation predisposing to lymphomagenesis is recognized in other settings, such as in people with Borrelia infection, persistent tattoos, venous stasis, burns, or certain viral scars. Here, prolonged immune response can cause local lymphoid tissue to become cancerous.

Recognition of an implant-associated GZL has thus made it imperative of the need for further study in this regard. Investigation of molecular events that lead to tumor formation in these contexts holds a promise for better understanding the risks that is associated to synthetic implants and could also guide the development of few screening tools for early detection of the cancer.

Crucially, there remains a very important need for consistent guidelines on the diagnosing and management of GZL. Long-term studies involving larger patient cohorts will help clarify the true frequency and progression of both mediastinal and implant-associated forms. Because of the rarity of this cancer, an interdisciplinary collaboration is essential to optimize care and also for in depth knowledge of their origins, especially when it comes to the context of artificial material exposure.

3.4 Conclusion

In summary, Gray Zone Lymphoma hence highlights both the complications associated with diagnosis and a continuous ongoing refinement of lymphoma diagnosis and treatment. Its unique status of being poised between cHL and DLBCL and now with an emerging link to synthetic implants, continues to challenge medical understanding. While regimens like R-CHOP offer encouraging responses, ongoing research is vital to illuminate the biology of GZL, improve treatments, and address possible risks linked with surgical implants. A continuous surveillance and research on patients with implants thus remain paramount, with respect to the growing incidence of malignancies associated with these instances.

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Soft tissue mass in inguinal region in CT scan
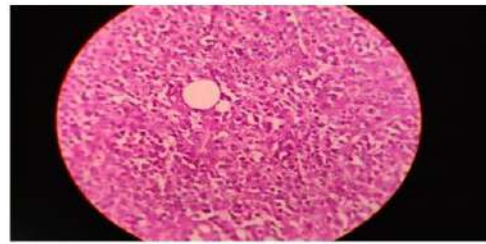
Histopathology reveal features of a lymphoproliferative disorder
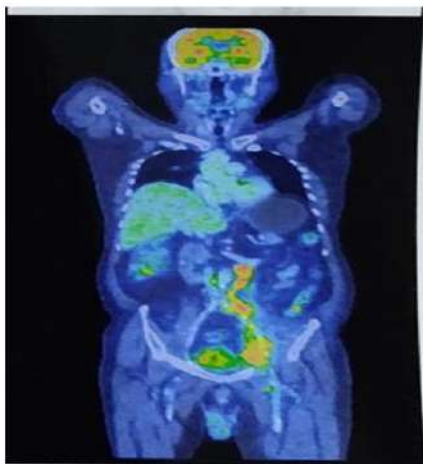
PET CT showed metabolically active pelvic, mediastinal and retroperitoneal lymph nodes

Repeat PET CT after 3 cycles R CHOP showed significant reduction in size of mass

CHAPTER 4:

A STUDY OF TRENDS OF PHYSICAL EDUCATION AND TECHNOLOGY IN 21ST CENTURY

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Abstract: Physical Education (PE) in 2025 is progressing to meet global challenges such as physical inactivity, mental health, and technology's growing role in education. This study investigated trends that guide the contemporary PE experience such as technology, inclusivity, holistic development, experiential learning, and lifelong fitness. In PE, technology, and specifically wearable technologies, gamification, and artificial intelligence (AI), have completely redefined how educational programming can be offered that is personalized, individual, and based on data. Technology can also provide immersive learning through virtual and augmented realities. Inclusive practices are supported through adaptive equipment, activity shape/size modification, and attention to balance of physical activity including culturally responsive PE. Mindfulness-based practices can support students' wellness, mental health, and wellness literacy - this includes time for reflection within PE. Outdoor and experiential learning can further develop the personal, social, and cultural competencies of students, and PE's capacity to motivate students to switch from competitive sports to lifelong fitness, which supports ongoing physical activity and wellness habits - this is an area for improvement after Covid-19 in delaying competitive sporting expectations. There are challenges using technology in PE such as equitable access or training specifically for PE in a pedagogically consistent way. This study illustrates the importance of a relevant and flexible PE curriculum to prepare students with the physical, mental and social skills that will benefit engagement in healthy behaviours in a complex world.

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4. Introduction

Physical Education (PE) is an important contributor to student's physical, mental and social well-being. PE is changing as of 2025, but will still seek to address many societal challenges, such as increasing levels of physical inactivity, mental health issues and technology in education. This chapter examines a number of overarching trends - technology, inclusive practices, developing the whole person, outdoor learning and lifelong fitness- and their relevance in developing a future-focused, dynamic PE curriculum.4

4.1 Technology in Physical Education

4.1.1 Wearable technology and data-driven fitness

Wearable technologies such as fitness trackers and smartwatches are providing real-time data on clients, allowing for immediate physiological feedback on heart rate, steps, sleep patterns. According to the American College of Sports Medicine's (ACSM) (2025) worldwide survey of fitness trends, wearables are ranked number one in trends, thus showing the potential diversity of wearables as tools in allowing PE educators to develop fitness plans tailored towards individual learners. Wearables act as motivation tools, acting as unique educational tools in developing physical activity in students achieving moderate-to-vigorous physical activity (MVPA) (WHO, 2022) each day. However, having equitable access is a challenge as the cost of some products, may allow under-resourced schools to miss out on this useful educational tool (Smith & Hardman, 2023).

4. 1.2 Gamification and immersive technologies

Gamification enables the has introduced a rise in engagement in using elements of games, such as points and leaderboards, into their PE learning right now. One example through the use of gamified entry learning platforms like Classcraft, can allow certain exercise sessions to be transformed through gamification by turning these into challenges within a game (Jones et al., 2024). Other platforms are utilising new technology with virtual reality (VR) and augmented reality (AR). VR workout games (e.g. Beat Saber) encourage movement while being in an engaging, immersive virtual environment (Lee & Park, 2025). AR allows digital overlays on to the physical world, providing direct access to visual instruction for learners while putting the headset to carry out each exercise designed for that session. These technologies have considerable potential and are viewed as an attractive component for schools but require heavy investment and additional teacher training (Gao & Lee, 2023).

4.1.3 Artificial Intelligence and virtual learning/teaching

Artificial Intelligence (AI) QR coding has the ability to assess students and to critically analyse individual performances, as well as the ability to curate learning engagements, programs and lessons for each student throughout a period of a semester or year. The ability of AI technology to collect data that measures movement patterning, deliver data led performance improvement strategies/personalised learning plan interventions, is particularly valuable for K - 12 learning environments where limited specialists are able to provide immediate curriculum activity support (Chen & Zhang, 2024). Virtual PE is an area for expansion following COVID -19. Platforms such as Zoom and exercise/fitness apps (e.g. Peloton) supported the delivery of online learning experiences, which may have increased the use of these technologies for remote learning approaches in PE learning and teaching (Parker et al., 2023). Virtual environments provide enhanced access to resources/policy, specialist teaching - yoga lesson, strength training program, pilates, college and gap year fitness lessons and video/audio tutorials, skill development etc.

4.2 Inclusion and Holistic Approaches

4.2.1 Inclusion Focus

Modern physical education recognizes the identities of students by taking an Inclusive physical education approach that aims to provide all students with equivalent access to participation (i.e., Inclusion). The recent (2023) National Physical Education and Physical Activity Plan additionally illustrates this by encouraging adaptive equipment and variability in participation experiences (NPAPA, 2023). For example, with wheels and senses, Inclusive Physical Education, sports including wheelchair sports and sensory-friendly forms of movement for students with a disability are framed in terms of equity. Including planned activities that are culturally responsive (like kabaddi or capoeira, for example) in support of students with many culturally diverse identities (which accommodates others), and gender-inclusive practices establish an inclusive space and lead to a higher engagement which limits barriers for participation (Taylor & Brown, 2024).

4.2.2 Mental Well-Being

Mindfulness, yoga and meditation in these regards are increasingly viewed as areas of PE which could be positively impacting mental health and well-being aspects. Martin & Lee (2024) assessed the impact of a mindfulness base PE in reducing stress levels, as compared to levels during a standard PE programming. They found that stress levels decreased by 20%. Additionally, they noted that mindfulness-based practices promote emotional regulation and

resilience related to adolescent mental health challenges. Schools may recognize its value because PE promotes everyone's well-being collectively.

4.2.3 Cross-disciplinary Learning

Cross-disciplinary learning (including multiple modes of integration), is one of the ways in PE that could realize additional learning experiences. Lessons may involve learning about exercise biomechanics (Science), estimating calories burned (Mathematics), or the cultural history of sport games (History), and these are only some of the ways PE assists students with learning (Smith & Hardman, 2023). This use may also actively involve those students who generally may not be very interested in physical activity - this also invokes curiosity in their learning, contributes to increase inclusive experiences overall, and may assist with motivating future participation in the activity.

4.3 Outdoor and Experiential Learning

4.3.1 Outdoor education

Outdoor education leads to gains in students' physical, mental, and social development, via developmentally appropriate experiences (e.g., hiking and orienteering). Educational institutions are utilizing the local environment both as an outdoor classroom as well as a context for environmental education, such as sustainability and fitness (Taylor & Brown, 2024). Education in the outdoors often allows students to have Indigenous experiences (e.g., snowshoeing in Canada) which contributes to increased cultural competence (Jones et al., 2024).

4.3.2 Experiential learning experiences

Experiential learning activities (e.g., role-plays, technical visits to local organizations) lead to increased student engagement and interaction. For example, when students visited the academic labs for sports science, or the simulated Olympic games (e.g., to provide contextualization about fitness concepts in PE class), Lee and Park (2025) found that the students were 25% more motivated to learn using these approaches rather than more direct and traditional methods. This learning experience provides a relevant and memorable context for the learning that is taking place.

4.4 Emphasis on Fitness for Life

4.4.1 Progressing from competition to lifelong fitness

PE is progressing away from 'competition' (e.g., dodgeball) with the assumption that competitive events promoted opportunities for less-athletic students to feel excluded, to promoting lifelong fitness through similar offerings (e.g., yoga, CrossFit) (Gao & Lee, 2023). Compounding this realization is the potential for sustainable health habits. Students are

promoted to create fitness plans that address their options according to their interests, talents, and capabilities.

4.4.2 Diversity of Global Activities

PE is opening up globally with regards to local curriculum, and is increasingly diverse (e.g., less common activities, like martial arts, as well as dance forms (e.g., Zumba). There is a diverse range of curriculum offerings, such as the ones mentioned above that may provide all students access to enjoyable activities, and will hopefully motivate continued participation in fitness-based lifetime activities (Chen & Zhang, 2024). Global games expand cultural awareness for the diverse representations.

4.5 Overcoming Challenges and Directions for Future

In 2022, the global physical inactivity rate was at 31% and is projected to reach 35% by 2030, highlighting the importance of physical education (WHO, 2022). Challenges include having inappropriately educated (or not educated) physical education specialists, particularly in situations where the PE program is led by generalist teachers (Martin & Lee, 2024). Artificial intelligence (AI) has the potential to scale up teacher professional development and outcomes and we have also identified some positive outcomes of using professional development conferences (Parker et al., 2023). In the future, physical education should prioritize technology access, equitable/inclusive practices and curricula considering the unknowns of preparing students with the physical, mental, and social outcomes to lead healthy lives.

4.6 Conclusion

In 2025, physical education continues to change with advancements in technology integration, inclusion, attention to holistic and outdoor learning, and a focus on supporting lifelong fitness practices. Wearables, gamification, and the use of AI will help to personalize the learning experience. Furthermore, considerations of inclusivity and mental health into physical education promotes equitable and supportive learning opportunities for all students. Outdoor and experiential learning will enhance engagement and provide a wide variety to fitness opportunities to adhere to sustainable fitness habits. Physical education must continue to tackle challenges associated with physical inactivity and the inconsistently trained teacher, to support all students to thrive in a complex world that requires many skills and competencies. Physical education is an essential aspect of education in the 21st century.

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