



# Mitigating Challenges to Effective Management of Post-Intensive Care Syndrome (PICS)

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## **Author's contribution**

*The sole author designed, analyzed, interpreted and prepared the manuscript.*

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## **ABSTRACT**

**Introduction:** Post-Intensive Care Syndrome (PICS) refers to the collective effects of prolonged physical and cognitive impairments and mental health problems during or after the stay in intensive care unit (ICU). PICS significantly affect patients' quality of life and ability to return to their normal routines. The challenges of PICS have become more pervasive since the Covid-19 pandemic. The aim of this study is to examine the challenges to effective management of PICS and suggest tangible ways of addressing them so as to reduce the prevalence of PICS, and improve on patients' wellbeing, quality of life and satisfaction with care services.

**Methods:** The descriptive survey is employed to make a brief systematic review of selected 2019—2024 literatures on PICS, the challenges, and the measures for managing the challenges effectively.

**Results:** There is a consensus on lack of awareness and inability to recognize the condition among healthcare professionals; the difficulty of predicting and managing the long-term effects of PICS; the significant emotional toll of PICS on patients and their families; and the fragmentation of healthcare systems, which together constrain effective management of PICS.

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**Conclusion:** To attain effective management of PICS, a comprehensive multidisciplinary approach, which can address cognitive, physical, and psychological aspects of the condition, has to be adopted. Resorting to a meaningful interdisciplinary collaboration among healthcare professionals, widespread awareness about PICS, the symptoms, and the need for early interventions would guarantee patients' attainment of maximal outcomes and improved quality of life.

*Keywords: Challenges; effectiveness; management; post-intensive care syndrome; prevalence.*

## 1. INTRODUCTION

Post-Intensive Care Syndrome (PICS) encompasses a spectrum of physical, cognitive, and mental health challenges experienced by survivors of critical illness during or after their stay in an Intensive Care Unit (ICU). Coined in 2010 by the Society of Critical Care Medicine, PICS highlights the onset or exacerbation of impairments in physical, cognitive and mental health resulting from the ICU experience [1,2]. The multifaceted nature of PICS, as outlined by Geense [3], Hwang [4], and Wiertzema [5], manifests in symptoms such as muscle weakness, cognitive impairment, anxiety, and depression, presenting complexities in its management. This adapted conceptual framework of PICS provides valuable insights into the comprehensive understanding of the syndrome and its implications. The framework depicts associated factors and outcomes. Consider the diagram.

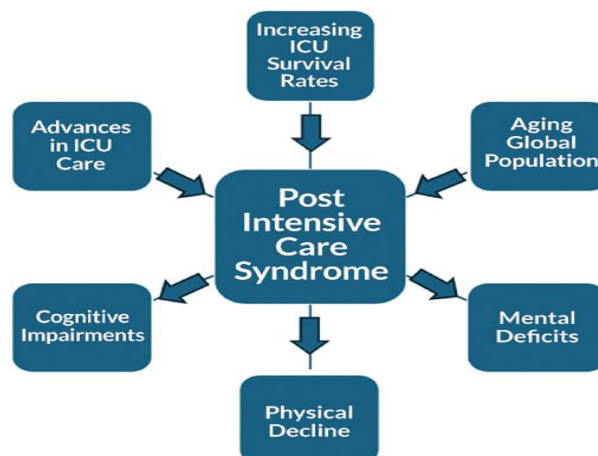
### 1.1 Purpose of Study

The aim of this study is to explore the challenges of managing PICS effectively. Its objectives are to:

- (i) Explore the constraints to effective management of PICS;
- (ii) Describe the state of affairs regarding PICS;
- (iii) Mitigate the prevalence of PICS to enhance patient well-being, quality of life, and satisfaction with care services
- (iv) Propose remedies to the challenges of managing PICS.

### 1.2 Research Problem

The treatment protocols administered to critical illness patients serve as significant determinants or contributors to the onset of PICS. Isolation from non-critically ill patients within the ICU environment exacerbates feelings of loneliness, nervousness, and depression among these individuals, which often lead to the development of PICS. The confinement to ICU quarters can significantly impact on patients' self-esteem and mental well-being, and compound the challenges they face during recovery. Cognitive impairments resulting from ICU stays frequently hinder survivors' ability to resume normal life routines or return to work. This further diminishes their quality of life and overall well-being.



**Fig. 1. Post intensive care syndrome**

*Source: Rutherford et al. [6]*

Additionally, many patients grapple with physical debilitation, which add another layer of complexity to their recovery journey. The complex nature of PICS makes it difficult for both patients and practitioners to detect and find solutions early enough. Aligning with the assertions of Paul and Weiss [7] regarding the imperative of addressing PICS management, this study underscores the significance of its thesis and advocacy. Motivated by the urgency highlighted by Rutherford et al. [6], Hiser et al. [8], Paul and Weiss [7], and other scholars, this research seeks to ways of mitigating PICS.

## 2. THE PREVALENCE OF PICS

A substantial proportion, ranging from 50% to 70%, of ICU survivors experience PICS within six months of post-discharge [9]. This study underscores the pervasive nature of PICS in the post-Covid-19 era. It corroborates the assertions advanced by this paper regarding the enduring prevalence of PICS since the onset of the pandemic in 2019 to date. Hiser et al. [8] present evidence of escalating rates of PICS cases in recent years that bolster the argument on the prevalence of PICS. The risk factors associated with PICS development are reported to be high [10,11]. Thus, there is the urgent need for comprehensive approaches to addressing the syndrome.

The persistent low decline in critical illness mortality rates from 1990 to 2017 compared with the significant rise in the prevalence of PICS since 2019 [12] underscores the pressing need for heightened interventions to mitigate the impact of PICS on survivors of critical illness. As confirmed by Mulkey et al. [13], the increasing number of critical illness survivors grappling with PICS necessitates proportionate efforts to reduce its prevalence. Therefore, this study attempts to contribute to the issue at stake by shedding light on the challenges hindering effective management of PICS. Next, it proposes actionable strategies to mitigate the impact of PICS. By examining these challenges and offering tangible solutions, the research makes a meaningful contribution to efforts made toward reducing the prevalence of PICS and enhancing the overall quality of care for ICU survivors.

Delirium emerges as a significant risk factor for cognitive impairment [6,11]. Additionally, previous mental health challenges are identified to be exacerbating the risk of PICS development

[11]. As noted by Rutherford et al. [6], Lee et al. [11], Geense et al. [14], and Physiopedia [10], the physical front risk factors for PICS include advanced age, high disease severity, and female gender susceptibility (i.e. females exhibiting a higher susceptibility to PICS than males). Acknowledging the need for further research to delineate the prevalence, severity, susceptibility, and intervention outcomes of PICS, this study aligns with the call for additional investigations into PICS. By examining the challenges impeding effective management of PICS and proposing mitigation strategies, this research contributes to the advancement of knowledge in this critical area of healthcare.

## 3. THE NEED TO REDUCE PICS

Various studies, including those by Physiopedia [10], Rutherford et al. [6], Geense et al. [14], and Brown et al. [1], advocate for early mobilization of patients, particularly those at higher risk of developing PICS. Doing so is a pivotal strategy for mitigating the increasing prevalence of PICS. Emphasizing the pivotal role of physiotherapists in PICS management, the aforementioned studies underscore the importance of proactive engagement by healthcare professionals in preventing and addressing PICS. Similarly, Mulkey et al. [13] stress the significance of intensive care unit (ICU) nurses' involvement in the adoption of proactive practices to minimize the risk of PICS development among patients. They advocate for problem-solving approaches that would diminish the severity of disability and optimize patient outcomes. They also stress the importance of nurses advocating for patients in need of specialized care.

Collectively, this body of research highlights the urgency of addressing PICS-related challenges and offers scholarly insights into effective strategies for healthcare professionals to combat this syndrome. Therefore, the present study underlines the importance of deploying multidimensional problem-solving approaches to effectively combat the high prevalence of PICS. Recognizing the significant burdens of PICS on anesthesiologists and other healthcare providers in the ICU, it is essential to proactively engage in addressing the factors contributing to PICS. This study observes that by providing additional need-based assistance and resources, healthcare professionals can yield substantial positive outcomes in mitigating PICS challenges and enhance effective management of the syndrome.

Moreover, enhancing and creating programs dedicated to PICS management are crucial steps toward addressing its complexities and combating its adverse effects. Additionally, this paper advocates that more efforts should be made to reduce the prolonged stay of critical illness patients in the ICU. This is in view of the fact that extended stay in the ICU can exacerbate the risk of developing PICS and exert enduring negative impacts on patients, their families, and healthcare professionals. Thus, shortening ICU stays could potentially mitigate the risk of PICS development and improve overall patient outcomes.

#### **4. CHALLENGES TO EFFECTIVE MANAGEMENT OF PICS**

Studies highlight the escalating pervasiveness of PICS in the wake of the Covid-19 pandemic [3, Nakanishi et al. [15], Rudd, [12]; LaBuzetta et al. [16]. These studies highlight the detrimental impact of PICS on patients' quality of life and their ability to reintegrate into normal routines post-discharge. They confirm that a substantial portion of ICU survivors grapple with diverse health challenges upon leaving the unit [14], (Wang et al., 2020; Brown et al. [1], Haines et al., 2019). These challenges manifest as a spectrum of symptoms. These include cognitive impairment, mental health struggles, insomnia, anxiety, depression, weakness, fatigue, post-traumatic stress disorder (PTSD), and coping difficulties [13,4,5]. These symptoms collectively constitute PICS. The variability and unpredictability of these symptoms present formidable obstacles to the effective management of the syndrome.

The multifaceted nature of PICS presents numerous challenges to effective management of PICS [6,16]. The elusive nature of PICS makes early detection and intervention challenging for both healthcare professionals and patients alike. The nature also complicates the implementation of timely measures. Beyond the physical manifestations, the cognitive and psychological components of PICS further exacerbate its management complexities. The cognitive impairment, emotional instability, and physical debilitation experienced by PICS patients contribute to the intricate landscape of challenges faced by healthcare providers. Addressing the diverse array of symptoms comprising PICS necessitates tailored approaches and individualized care plans, reflecting each patient's unique health status and

requirements. The foregoing underscores the imperative for personalized and comprehensive management strategies within the ICU setting.

Insufficient understanding or awareness of PICS among healthcare professionals, patients, and their families presents a formidable obstacle to effective management [6,16]. Without adequate knowledge, efforts toward intervention are hampered. This point highlights the pivotal role of education and awareness. As the saying goes, "one who is not informed is deformed." This statement underscores the critical importance of being well-informed to effectively manage PICS. Comprehensive awareness initiatives targeting patients, families, and a range of healthcare professionals, including anesthesiologists, critical care physicians, nurses, and surgeons, are imperative for addressing these challenges. Intensive educational efforts aimed at imparting detailed knowledge of PICS dynamics would facilitate the development of informed management strategies. Moreover, this study advocates embracing multidisciplinary approaches and the fostering of interdisciplinary collaboration, as additional remedies to mitigating these challenges.

Effective communication between healthcare professionals, patients, and their families is paramount for the successful management of PICS. Research underscores the challenges posed by communication barriers within the ICU, emphasizing the importance of implementing specific communication techniques to overcome these obstacles [17,18]. Addressing these barriers is essential to ensure that support, care, and medications are delivered efficiently and accurately. Ali [19] identifies the following common barriers to effective communication between nurses and patients in the ICU: background noise, demanding tasks, and lack of privacy. These same barriers impact communication across various medical professionals and patients, both within and beyond the critical care unit, which underscore the need for concerted efforts to ameliorate communication challenges and enhance the overall management of PICS.

Effective management of PICS faces significant hurdles stemming from inadequate logistical support, infrastructure, amenities, and personnel shortages. The scarcity of essential facilities essential for PICS management leads to myriad operational inefficiencies, compromised service delivery, quality assurance issues, and

deficiencies in patient care. A deficiency in resources, programs, and projects exacerbates these challenges. Thus, the need for sufficient resources to address PICS effectively cannot be over-emphasized. Moreover, social challenges, such as stigma and misconceptions, further complicate PICS management, as individuals may refrain from seeking help to avoid stigmatization. Addressing these social barriers requires comprehensive efforts to educate and sensitize the public. Doing so dispels negative perceptions and fosters a supportive environment conducive for effective PICS management. These efforts would address deep-seated cultural, religious, and societal sentiments surrounding PICS to mitigate the impact of stigma and misconceptions on patients' access to care and treatment.

## **5. MITIGATING CHALLENGES OF EFFECTIVE MANAGEMENT OF PICS**

Here, the paper offers its unique perspective on strategies for effective management of PICS, with a reflection on extant studies. Notably, a consensus emerges within the literature regarding the efficacy of interventions across the three main categories of PICS and the associated symptoms. Studies converge on pivotal physical interventions, encompassing physical therapy, early mobilization, nutritional assessment and enhancement, rehabilitation, utilization of recovery manuals, exercise regimens, and nursing interventions such as ongoing monitoring, prescription management, and follow-up care [9,6,20,21,3,22,4,23,1].

Scholars align on diverse strategies to effectively address the mental and social health dimensions of PICS, encompassing the utilization of ICU diaries, early psychological interventions, nurse-led preventative measures, animal-assisted therapy, open visitation policies, internet-based cognitive interventions, and peer and family support networks, alongside rehabilitation programs [9,6,13,4,,1,5] Moreover, there is unanimous acknowledgment of the pivotal role of cognitive interventions, predominantly through cognitive therapy delivered at home and digital cognitive rehabilitation platforms, as emphasized across studies [9,6,20,21,22,4]

A consensus emerging from multiple literature sources underscores the effectiveness of interventions facilitated through care coordination and personalized care planning [6,9]. These interventions encompass a range of strategies,

including the transition of elderly ICU patients to geriatric wards, the implementation of multifaceted programs, medication management protocols, mobile care coordination initiatives led by nurses, and disease management support services [1,24,25,26,27,28]. Given the noted inefficacy of many interventions [1], it becomes imperative to elevate efforts and explore alternative measures or strategies. Interventions ought to be tailored toward addressing the four principal dimensions central to the lives of survivors. These are pivotal to the dynamics of the syndrome.

It is incumbent upon survivors and their families to diligently uphold and adhere to the treatment regimens prescribed during hospitalization. Achieving effective interventions necessitates a heightened dedication to scholarly and scientific inquiry into PICS. Within the scope of this discourse, social interventions emerge as paramount, exhibiting superior efficacy and comprehensiveness, while synergistically interfacing with other intervention modalities. Social interventions encompass a broad array of factors. These include, but are not limited to: fostering support networks, mitigating instances of discrimination, providing guidance, facilitating effective communication, and nurturing sustained social interaction and harmonious relationships. Social interventions encompass strategies aimed at bridging any gap between the survivor and their family members, which ensure equitable treatment and inclusion, and actively engaging them in health-promoting social activities. These activities include recreational pursuits, such as games, sports, and dance; intellectual endeavors like reading, participation in group activities; and membership of community organizations. This study emphasizes that many of these activities exert positive influences on cognitive functioning that thereby enhance the overall well-being of survivors who partake in them.

It should be noted that the foregoing points, among others, are what this study proposes in its own ways, from both personal and generic perspectives. Thus, to show its contributions to the discourse on PICS, as in other parts, citations are left out. Basically, what has done above is a systematized presentation or expression of professional experiences in PICS and a synthesis of points advanced by different literatures on PICS. Furthermore, rehabilitation efforts (Renner et al., 2023), lifestyle adjustments, adherence to medication regimens as prescribed, regular exercise, and adherence

to balanced nutritional habits represent pivotal components in addressing both the physical and psychological dimensions of the syndrome. These interventions offer tangible avenues for mitigating the adverse effects of PICS, particularly within the realms of physical and psychological health. Also, this paper advocates the implementation of repeated pre-discharge diagnoses as a pivotal measure for addressing the challenges to effective management of PICS. Managing PICS effectively implies combating its detrimental impact on patients, their families and healthcare professionals of the ICU.

Additionally, providing ongoing support to discharged patients, such as through regular communication via phone and other modern media platforms, can significantly contribute to their sustained health and expedited recovery. This approach encompasses the integration of telepsychology interventions into other facets and interventions of telemedicine. Telepsychology has the potentials of addressing PICS, particularly in terms of extending psychological support to patients beyond the confines of the hospital setting [27]. More so, healthcare professionals in the ICU should allocate resources to facilitate patient and family education initiatives. In addition to equipping them with essential resources, it is imperative to educate them on the risk factors, symptoms, and the significance of early interventions for PICS. This educational endeavor aims to empower patients and their families with comprehensive knowledge of PICS as well as healthy living as a whole, which keep them well-informed about the nuances of PICS and equip them with how to effectively navigate the challenges of PICS. Thus, this averts potential complications arising from misinformation or ignorance.

Apart from the above identified measures, physical rehabilitation stands as a vital avenue for both confronting PICS and surmounting the obstacles to its effective management. Following prolonged stay in the ICU, the implementation of physical interventions such as tailored exercises and body therapy emerges as a promising approach that yields favorable outcomes. These interventions facilitate the restoration of patients' physical fitness, enhancement of balance and coordination, and augmentation of overall physical functionality. Fundamentally, physical rehabilitation plays a pivotal role in enabling patients to reclaim their physical prowess, foster

independence, and ultimately elevate their quality of life. Besides, mitigating the cognitive challenges inherent in managing PICS necessitates the development and implementation of pragmatic strategies capable of addressing these issues head-on. This study further observes that survivors commonly contend with a spectrum of cognitive hurdles, including difficulties with concentration, indecisiveness, delirium, and memory impairment. Effectively addressing these challenges mandates the deployment of targeted cognitive interventions and measures aimed at bolstering cognitive functioning and ameliorating the associated cognitive impairments.

Cognitive psychology offers a multifaceted approach to addressing the psychological struggles encountered by survivor patients, including cognitive dysfunction, memory loss, diminished concentration, depression, and post-traumatic stress disorder (PTSD) [12]. These cognitive interventions not only aid individuals in coping with such challenges but also serve as effective tools for combating PICS and alleviating the associated management hurdles. Consistent counseling, as a cognitive intervention, emerges as a particularly valuable means of mitigating the complexities of managing PICS. Thus, while cognitive challenges pose significant obstacles in the management of PICS, cognitive strategies serve a dual purpose: combating the condition itself and mitigating the challenges inherent in its management.

Finally, the effective management of PICS hinges significantly on the meticulous administration and monitoring of medication regimens. Following discharge, patients receiving post-discharge medications require diligent follow-up to ensure adherence and proper intake of drugs. Monitoring of medication efficacy and potential side effects necessitates the collaborative expertise of the family physician and pharmacist, who may recommend adjustments to mitigate adverse reactions or allergies. In addition, dietary and lifestyle modifications are paramount, requiring consistent and supportive counseling to foster patient compliance. For instance, smokers and individuals consuming stimulating substances must be counseled and encouraged to cease these habits. Introducing survivors to improved dietary practices and routines serves to effectively address their PICS manifestations and enhance overall management outcomes.

## 6. CONCLUSION

The advent of the Covid-19 era has brought to the forefront a concerning surge in the prevalence of PICS, prompting profound apprehension among healthcare professionals, policymakers, and researchers alike. This surge has catalyzed concerted efforts to discern the underlying causes of PICS prevalence and to devise strategies aimed at its reduction and the amelioration of the associated management challenges. Despite the acknowledged hurdles delineated in various scholarly works, the collective consensus underscores the potentials for mitigating PICS and its challenges through sustained and multifaceted approaches. The imperative for continuous and intensified exploration of interventions underscores the necessity for survivor support systems encompassing guidance, encouragement, rehabilitation, effective communication, and familial assistance that all essential for facilitating the resumption of normal life routines post-ICU discharge. Addressing the multifaceted challenges inherent in managing PICS does not only entail ameliorating its symptoms but also embodies an overarching endeavor to combat the syndrome itself. The effectiveness in mitigating these challenges mirrors success in managing PICS, with comprehensive strategies spanning cognitive, psychological, physical, and social dimensions.

By adopting such holistic approaches, healthcare providers can play a pivotal role in facilitating patient recovery and enhancing long-term outcomes. However, the complexity and frustrations inherent in managing PICS necessitate ongoing efforts and innovation that demand healthcare professionals, including anesthesiologists, to persist in their pursuit of improved measures and outcomes. In all, the clandestine nature of PICS, often eluding detection by both patients and healthcare providers in the ICU, underscores the critical importance of proactive education and awareness initiatives. Empowering patients and their families with the knowledge to recognize and manage PICS symptoms is paramount. To that end, the mentorship of junior healthcare colleagues by seasoned professionals is imperative. Pre-discharge counseling sessions should be held to equip patients and their loved ones with the tools with which to identify potential risk factors and mitigate the adverse outcomes. These educational efforts extend beyond the mere recognition of symptoms, which

encompass the prevention of stigmatization, discrimination, and misconceptions surrounding PICS survivors. These thereby form a crucial component of a multifaceted strategy for effective management of PICS as well as for effective mitigation of the challenges.

## CONSENT AND ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Author has declared that no competing interests exist.

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