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Adolescents' Resilience with Lower-Limb Loss after Prosthetic Rehabilitation: A Cross-Sectional Study

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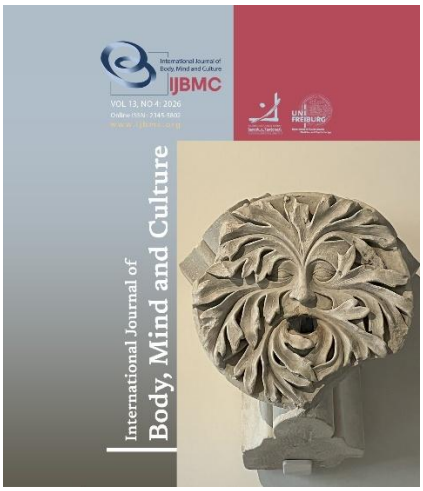

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ABSTRACT

Objective: The study aimed to determine adolescents' resilience levels following lower-limb loss and prosthetic rehabilitation.

Methods and Materials: A cross sectional study design was conducted in Baghdad city at three centers of prosthetic and rehabilitation, purposive sample through non probability technique was conducted for the achievement goals of the study, a scale that used in the study was Connor –Davidson resilience scale -25, the study participants were adolescents with physical disability after prosthetic rehabilitation with congenital and acquired lower limb loss at the study setting, the study consumed for the period of February until 6th, 2025 to December 10th, 2025, in order to give comprehensive insight about adolescents resilience. The data were collected using a study instrument through face-to-face interviews with participants. In addition, use descriptive and inferential statistical methods in SPSS version 26.0 to analyze the data after coding and managing it.

Findings: The study findings reveal that the vast majority of participants (97.4%) demonstrated a high level of psychological resilience. The findings indicate that no statistically significant associations were found between psychological resilience and any of the examined socio-demographic variables ($p > 0.05$).

Conclusion: The limited duration of prosthetic use among participants suggests a potential barrier to psychological adaptation. Increased access to rehabilitation programs and prolonged exposure to prosthetics could enhance both physical function and psychological resilience.

Keywords: Adolescents, Resilience, Lower limb loss, Prosthetic Rehabilitation.

Introduction

Lower limb loss (LLL) is a life-altering event that necessitates profound physiological, psychological, and social adaptations. In the current medical landscape, the focus has shifted from mere survival and basic wound healing to a holistic approach emphasizing functional restoration, prosthetic integration, and long-term quality of life (QOL) (Molina & Faulk, 2019; Saadoon, 2017). The causes of lower limb loss vary significantly by age and global region (Eidmann et al., 2023). Adolescence (ages 10–19) represents a unique clinical demographic in which the causes of lower-limb loss (LLL) diverge sharply from the vascular-dominant etiologies seen in adults. While the global incidence of pediatric amputation has trended downward due to improved safety regulations and limb-salvage techniques, the 15–19 age group remains at the highest risk for new cases, with a relative risk of 1.28 compared to younger children (Zheng et al., 2024).

The primary drivers of lower-limb loss in this population are categorized as traumatic, oncological, and congenital revision etiologies (Horsch et al., 2022). Trauma is the most frequent cause of acquired lower limb loss among adolescents worldwide. Unlike younger children, whose injuries often involve household accidents (e.g., lawnmowers), adolescents are more susceptible to high-energy external forces, road traffic accidents (RTAs): Motor vehicle collisions and motorcycle accidents are the primary mechanisms for traumatic LLL in the 12–19 age bracket Masten (2021), Mechanical and industrial forces; In developing regions or rural areas, farm machinery and industrial equipment remain significant risks (Zheng et al., 2024), furthermore; violence and conflict In specific geopolitical regions, firearm-related injuries and blast trauma (from landmines or explosive remnants) account for a high percentage of adolescent amputations, often resulting in complex, multi-level limb loss (Boyle et al., 1982).

A smaller subset of adolescent limb loss arises from the surgical conversion of congenital limb deficiencies. As adolescents reach skeletal maturity, they may opt for elective amputation (such as the Syme's procedure) to facilitate better prosthetic fit and improved long-term mobility (Bosques & Holden, 2014). Additionally, in some regions, complications from untreated infections or gangrene—sometimes exacerbated by improper traditional bone-setting—can lead to secondary amputation (Olusola et al., 2025).

Adolescence is a period defined by rapid physical change and identity formation, making the experience of lower limb loss (LLL) uniquely disruptive to the developmental trajectory. Whether arising from traumatic injury, congenital deficiency, or oncological necessity, the loss of a limb during these formative years forces a premature confrontation with mortality, bodily integrity, and social "differentness." Resilience in this context is the complex, multisystemic process by which an adolescent integrates limb loss into a revised sense of self while maintaining positive mental health and social participation (Al-Saady et al., 2026; Backes et al., 2019).

Resilience in adolescents with LLL is not merely the absence of distress but the presence of specific protective factors that facilitate adaptation. Prosthetic Acceptance and Satisfaction: Successful integration of a prosthetic limb is a significant predictor of resilience. A prosthesis that meets an adolescent's aesthetic and functional needs—allowing them to "feel normal"—is strongly associated with higher self-esteem and quality of life (Maffoni et al., 2025; Mithila, 2022). In addition, Physical Activity and Sport; Engaging in sports provides a venue for redeveloping identity and proving physical competency (Jasim & Al-Jubouri, 2025). It transitions the adolescent from a "disabled" identity to an "active" or "athletic" identity, which is a key driver of post-traumatic growth (Gai, 2025).

The decision to amputate a limb follows at least one of several indications, including severe trauma, infection, tumors, congenital anomalies, and vascular abnormalities (Griffet, 2016). Evidence suggests that the reasons for amputations and their frequencies differ widely between countries. For instance, peripheral vascular disease is perceived as the leading cause of amputation in developed countries. At the same time, trauma, infection, and malignant tumors are reported as leading causes for major limb amputation in developing countries (Abou-Zamzam Jr et al., 2003).

An estimated 1.3 billion people experience significant impairment. This amounts to 1 in 6 of us, or 16% of the global population. Some people with disabilities die up to 20 years earlier than those without disabilities. Individuals with impairments are twice as

likely to experience the onset of illnesses like obesity, diabetes, asthma, depression, and poor dental health. Many health disparities affect people with impairments. Accessible and reasonably priced transportation is 15 times more difficult for people with impairments than it is for people without disabilities. Unfair situations that people with disabilities must deal with, such as stigma, discrimination, poverty, exclusion from school and work, and obstacles within the healthcare system, are the root cause of health disparities (Brennan, 2020).

Prosthetic management of children with congenital lower-limb deficiencies can be a very complex process and is best carried out in special clinics offering comprehensive care for juvenile amputees. Comprehensive care is usually essential for children with multiple limb deficiencies. Approximately 70% of juvenile amputees have congenital limb deficiencies, and most of these are of the lower extremities. The problems confronting the orthopedist and prosthetist in the child with a congenital lower-limb deficiency include corrective and revision surgery, the effects of growth on the involved extremity, prosthetic fitting and revisions, prosthetic training, extremity function, and psychological adaptation and acceptance (Hall et al., 2020).

While there is considerable research on physical disabilities, there is less emphasis on the psychological aspects, particularly resilience. This gap limits our understanding of how these children navigate their experiences; existing studies often overlook the variability in resilience factors among different demographics (e.g., age, gender, type of disability). More nuanced research is needed to identify specific factors that contribute to resilience in diverse groups. Most research has been conducted in Western contexts, leaving a gap in understanding how cultural factors influence resilience in children with physical disabilities (Zukerman et al., 2024).

This study aims to determine adolescents' resilience levels following prosthetic rehabilitation for congenital and acquired lower-limb loss, and to examine the association between adolescents' resilience levels and their socio-demographic characteristics and clinical features.

Methods and Materials

Study Design

The research design was cross-sectional. The study was conducted at Baghdad city in (Baghdad artificial limbs center, Prosthetics and Rehabilitation Center – Baghdad health Al- Russafa directorate and Baghdad health Al- Karkh directorate at Mohammed Baqer Al-Hakeem Hospital – prosthetic rehabilitation center). The participants were selected from the study setting using a non-probability technique (purposive sample). The study included 116 adolescents aged 12 to 20 years with prosthetic devices who met certain criteria and excluded those who had worn prostheses for less than 4 months. The present study period started from February 6th, 2025, to December 10th, 2025.

Instrument

The study instrument consists of two parts: the first part includes socio-demographic data and clinical features of adolescents with lower-limb loss after prosthetic rehabilitation, and the second part includes the Connor-Davidson Resilience Scale-10 (CD-RISC-25, Connor & Davidson, 2003). The Connor-Davidson Resilience Scale (CD-RISC 25) is a 25-item self-report instrument that measures personal competence, stress-related effects, acceptance of change, strong relationships, sense of control, and spirituality. Each item is scored on a 5-point Likert scale (0 = “not true” to 4 = “true nearly all the time”). The scores from individual items are summed to yield a score ranging from 0 to 100, with higher scores indicating greater resilience. For the original scale, Cronbach’s α was 0.8 (Campbell-Sills & Stein, 2007).

The data were collected using the study instrument through face-to-face interviews with adolescents at physiotherapy and psychological rehabilitation units, after obtaining written informed consent from each participant. Filling out the questionnaire takes approximately 10-20 minutes.

Analysis

The data were analyzed and interpreted using the Statistical Package for the Social Sciences (SPSS), version 26.0. Moreover, all statistical tests were performed at an alpha level of 0.05. Descriptive statistics were calculated to summarize the variables and demographic characteristics. The Spearman Correlation Coefficient is used to study the relationship

between resilience and socio- demographic data and clinical features.

Ethical Considerations

The study adhered to the ethical principles outlined in the Declaration of Helsinki, which governs research involving human participants. All participants were fully informed of the study's purpose, procedures, and potential risks, and their participation was voluntary. Informed consent was obtained from each participant and their guardians (when applicable) before the study commenced.

To protect participant privacy and confidentiality, all data were collected anonymously and securely stored. Participants had the right to withdraw from the study at any time without facing any negative consequences. The study was approved by the relevant ethical committee at the University of Baghdad, ensuring that the research met the highest standards of ethical conduct.

Findings and Results

Table 1 shows that the participants' ages ranged from 12 to 20 years, with a mean age of 15.9 ± 2.2 years. The majority (43.1%) were 15–17 years old, followed by 30.2% aged 18–20, while only 26.1% were 12–14 years old. Regarding gender, males comprised 59.5% of the sample compared with 40.5% females. In terms of educational level, more than one-third (36.2%) had completed primary school, while 24.1% were illiterate, and 23.3% were only literate without formal schooling. As for family size, the majority (44.8%) had 1–3 siblings, followed by 30.2% with 4–5 siblings and 25% with 6 or more siblings, reflecting moderately sized families overall.

Table 1

Description of Participants according to their Socio-demographic Characteristics

List	Characteristics		No	%
1	**Age (years)**	12 – 14	31	26.1
	M±SD= 15.9±2.2	15 – 17	50	43.1
		18 – 20	35	30.2
		Total	***116***	***100***
2	**Gender**	Male	69	59.5
		Female	47	40.5
		Total	***116***	***100***
3	**Level of education**	Illiterate	28	24.1
		Literate	27	23.3
		Primary school	42	36.2
		Intermediate school	19	16.4
		Total	***116***	***100***
4	**Number of siblings**	1 – 3	52	44.8
		4 – 5	35	30.2
		6 +	29	25
		Total	***116***	***100***
5	**Father's occupation**	Employed	47	40.5
		Unemployed	69	59.5
		Total	***116***	***100***
6	**Mother's occupation**	Employed	23	19.8
		Unemployed	93	90.2
		Total	***116***	***100***
7	**Residency**	Urban	79	68.1
		Rural	37	31.9
		Total	***116***	***100***
	Monthly income	Sufficient	20	17.2
		Somewhat sufficient	72	62.1
		insufficient	24	20.7
		Total	***116***	***100***

No: Number, %: Percentage, M: Mean, SD: Standard deviation

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With respect to parental occupation, 59.5% of fathers and 90.2% of mothers were unemployed, highlighting a generally low socioeconomic status among participants' households. Regarding residency, most participants (68.1%) lived in urban areas, while 31.9% lived in rural areas. Finally, the distribution of monthly income shows that 62.1% reported their income as "somewhat sufficient," 20.7% as insufficient, and only 17.2% as sufficient.

Table 2

Description of Participants according to their Clinical Characteristics

List	Characteristics		No	%
1	**Type and location of disability**	Partial limb	58	50
		Total limb	58	50
		Total	***116***	***100***
2	**Causes of amputation**	Congenital	29	25
		Diabetes	23	19.8
		Traumatic injury	48	41.4
		Cancer	16	13.8
		Total	***116***	***100***
3	**Duration of prosthetic use**	Less than 1 year	51	44
		1.0 – 2.5 years	47	40.5
		More than 2.5 years	18	15.5
		Total	***116***	***100***
4	**Belief in the creator**	Low	0	0
		Moderate	0	0
		High	116	100
		Total	***116***	***100***
5	**Participation in a rehabilitation program**	None	106	91.4
		≤ 6 months	3	2.6
		7 – 12 months	6	5.1
		13 + months	1	.9
		Total	***116***	***100***

No: Number, %: Percentage

Table 2 illustrates the clinical characteristics of the participants with limb disabilities. The findings show that half of the participants (50%) had partial limb disabilities, while the other half (50%) suffered from total limb disabilities. Regarding the causes of amputation, the highest percentage (41.4%) resulted from traumatic injuries, followed by congenital causes (25%) and diabetes-related amputations (19.8%), while cancer accounted for 13.8% of the cases. Regarding the duration of prosthetic use, nearly half of the participants (44%) had used their prosthesis for less than 1 year, 40.5% for 1–2.5 years, and only 15.5% for more than 2.5 years. Regarding spiritual belief, all participants (100%) reported a high level of belief in the Creator. Regarding participation in rehabilitation programs, the overwhelming majority (91.4%) had not participated in any, while only a small proportion (8.6%) had some participation, mostly for less than 1 year.

Table 3

Overall Resilience among Adolescents with Physical Disability after Prosthetic Rehabilitation

Psychological Resilience	No	%	M	SD	Eval.
Low	0	0	80.17	6.268	**High psychological resilience**
Moderate	3	2.6			
High	113	97.4			
Total	*116*	*100*			

No: Number, %: Percentage, M: Mean for total score, SD: Standard Deviation for total score, Eval: Evaluation. Low= 0.0 – 33.33, Moderate= 33.34 – 66.67, High= 66.68 – 100

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Table 3 reveals that the vast majority of participants (97.4%) demonstrated a high level of psychological resilience, while only 2.6% showed a moderate level, and none were classified as having low resilience. The mean score of 80.17 ± 6.268 further confirms that overall psychological resilience was high.

Table 4

Association between Psychological Resilience and Sociodemographic Variables of Adolescents with Physical Disability (N=116)

Variables		Psychological Resilience			
		Mean	SD	ρ	*Sig*
Age (years)	12 – 14	78.68	6.503	.074	.427
	15 – 17	81.16	6.162		
	18 – 20	80.09	6.113		
Gender	Male	81.01	5.827	.151	.105
	Female	78.94	6.739		
Level of education	Illiterate	79.57	5.426	.180	.054
	Literate	78.59	5.963		
	Primary school	80.74	6.858		
	Intermediate school	82.05	6.294		
Number of siblings	1 – 3	80.04	6.065	.005	.958
	4 – 5	80.26	7.143		
	6 +	80.31	5.689		
Father's occupation	Employed	79.09	6.672	.112	230
	Unemployed	80.91	5.913		
Mother's occupation	Employed	79.96	4.977	.016	.861
	Unemployed	80.23	6.571		
Residency	Urban	80.65	6.506	.108	249
	Rural	79.16	5.679		
Monthly income	Sufficient	81.35	5.029	.084	.373
	Somewhat sufficient	80.10	6.340		
	insufficient	79.42	7.046		

ρ: Spearman Correlation coefficient, Sig: Significance, No: Number, %: Percentage

Table 4 shows the association between psychological resilience and various socio-demographic variables among adolescents with physical disabilities. The findings indicate that no statistically significant associations were found between psychological resilience and any of the examined socio-demographic variables ($p > 0.05$). Although not significant, higher mean resilience scores were observed among participants aged 15–17 years (81.16 ± 6.162), those with intermediate school education (82.05 ± 6.294), males (81.01 ± 5.827), and those from urban areas (80.65 ± 6.506).

Table 5

Association between Psychological Resilience and Clinical Variables of Adolescents with Physical Disability (N=116)

Variables		Psychological Resilience			
		Mean	SD	ρ	*Sig*
Type and location of disability	Partial limb	80.09	6.154	.020	.828
	Total limb	80.26	6.433		
Causes of amputation	Congenital	79.17	6.006	.112	.233
	Diabetes	78.96	6.263		
	Traumatic injury	81.33	6.403		
	Cancer	80.25	6.277		
Duration of prosthetic use	Less than 1 year	79.14	5.621	.168	.072
	1.0 – 2.5 years	80.74	6.526		
	More than 2.5 years	81.61	7.163		
Participation in a rehabilitation program	None	79.94	6.318	.129	.169
	≤ 6 months	79.67	2.517		
	7 – 12 months	83.50	6.442		
	13 + months	86.00	0.000		

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ρ: Spearman Correlation coefficient, Sig: Significance

Table 5 shows the association between psychological resilience and various clinical variables among adolescents with physical disabilities. The results indicate that no statistically significant associations were found between psychological resilience and any of the clinical variables examined ($p > 0.05$). Although the differences were not significant, higher mean resilience scores were observed among participants with longer prosthetic use duration (more than 2.5 years: 81.61 ± 7.163) and those who participated in rehabilitation programs for longer (13+ months: 86.00 ± 0.000). These trends suggest that continued rehabilitation and prolonged prosthetic use may contribute positively to resilience, even though the relationship did not reach statistical significance.

Discussion and Conclusion

The results presented in the tables cover various social, psychological, and clinical aspects of participants with limb disabilities. Through data analysis, several important points can be drawn regarding the factors influencing mental health and coping abilities among these individuals.

The results indicate that participants range in age from 12 to 20 years, with a mean age of 15.9 ± 2.2 years. This result is supported by Mohammed (2023), who states that recent findings indicate a significant portion of this student population (41.8%) is in the second intermediate stage, typically comprising the 12–14-year-old age bracket. This age group represents a critical stage of growth and development, during which adolescents are more susceptible to psychological and social challenges (Steinberg, 2015). Additionally, male participants (59.5%) outnumber female participants (40.5%), a result supported by Shalash & Mousa (2024). who obtained that found that the majority of the patients were male, with 70% .which may reflect social and cultural influences on how disabilities are perceived and managed. This result disagrees with AL-jubouri & Alwan (2022), who show that the percentage of females was (55.8%) higher than that of males.

The findings reveal that over one-third of participants have completed primary education, while the illiteracy rate stands at 24.1%. This low educational attainment may negatively impact access to psychological and social support, as education is linked to higher levels of mental health awareness (Marmot, 2005). Furthermore, a significant proportion of parents are unemployed, indicating a weak economic situation that may increase psychological stress on youth. In addition, with respect to parental occupation, 59.5% of fathers and 90.2% of mothers were unemployed, highlighting a generally low socioeconomic status among participants' households. These findings are supported by Wadi & Ajil (2025), who show that most unemployed participants (64.6%) also agreed with Shawq et al. (2020). For the study findings that appear, the mother does not work with (65.8 %).

The results show that half of the participants suffer from complete limb disabilities, while the other half have partial disabilities. The most common causes for limb amputations were injuries resulting from accidents, highlighting the importance of personal safety and awareness (Organization & Staff, 2013). Regarding prosthetic usage, most participants have used their prosthetics for less than a year, which may affect their psychological adaptation.

The findings indicate that the vast majority of participants (97.4%) exhibit a high level of psychological resilience. Studies have shown that psychological resilience plays a crucial role in how individuals cope with stress and challenges (Connor & Davidson, 2003). However, no statistically significant correlations were found between psychological resilience and demographic or clinical variables, suggesting that other factors may be more influential. These findings agreed with Ameen & Hussein (2023). who show that the research on nursing staff indicates a high level of psychological empowerment (66.7%), with a mean score of 47.24 ± 5.884.

The limited duration of prosthetic use among participants suggests a potential barrier to psychological adaptation. Increased access to rehabilitation programs and prolonged exposure to prosthetics could enhance both physical function and psychological resilience. The majority of participants exhibiting high levels of psychological resilience is encouraging. This suggests that many individuals with limb disabilities possess adaptive coping mechanisms, which can be leveraged in therapeutic interventions. However, the lack of significant correlations with demographic or clinical

variables indicates that resilience may stem from intrinsic factors or external support systems not measured in this study. The absence of statistically significant correlations between resilience and other variables suggests the need for further research to identify additional factors influencing psychological well-being in this population. Understanding these factors could inform the development of tailored interventions to enhance resilience and overall mental health.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Declaration of Helsinki, which provides guidelines for ethical research involving human participants. Ethical considerations in this study were that participation was entirely optional.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contribute to this study.

References

Abou-Zamzam Jr, A. M., Teruya, T. H., Killeen, J. D., & Ballard, J. L. (2003). Major lower extremity amputation in an academic vascular center. *Annals of Vascular Surgery*, *17*(1), 86–90. https://doi.org/10.1007/s10016-001-0340-0

Al-jubouri, S. M., & Alwan, I. H. (2022). Parental styles and their relationship to psychological adjustment among preparatory students. *International Journal of Health Sciences*, *6*(1), 4831–4838. https://doi.org/10.53730/ijhs.v6nS1.5923

Al-Saady, Z. M., Abadi, N. N., Atiyah, K. G., & Majeed, H. M. (2026). Impact of Patients' Education upon Reducing Psychological Distress during Diabetic Journey. *Journal of Nature and Science of Medicine*, *9*(1), 44–48. https://doi.org/10.4103/jnsm.jnsm_123_25

Ameen, K. J., & Hussein, H. A. (2023). Relationship between Organizational Climate and Psychological Empowerment among Nurses at Primary Health Care Centers. *International Journal of Body, Mind & Culture (2345–5802)*, *10*(3). 10.22122/ijbmc.v10i3.536

Backes, E. P., Bonnie, R. J., National Academies of Sciences, E., & Medicine. (2019). Inequity and Adolescence. In *The Promise of Adolescence: Realizing Opportunity for All Youth*. National Academies Press (US). https://www.jahonline.org/article/S1054-139X(19)30385-4/abstract

Bosques, G., & Holden, J. Pediatric Acquired Upper and Lower Limb Deficiency. https://now.aapmr.org/pediatric-acquired-upper-and-lower-limb-deficiency/

Boyle, M., Tebbi, C. K., Mindell, E. R., & Mettlin, C. J. (1982). Adolescent adjustment to amputation. *Medical and Pediatric Oncology*, *10*(3), 301–312. https://doi.org/10.1002/mpo.2950100312

Brennan, C. S. (2020). Disability rights during the pandemic: a global report on findings of the COVID-19 Disability Rights Monitor. https://anrows.intersearch.com.au/anrowsjspui/bitstream/1/20742/1/Disability-Rights-During-the-Pandemic-report-web.pdf

Campbell-Sills, L., & Stein, M. B. (2007). Psychometric analysis and refinement of the Connor–Davidson Resilience Scale (CD-RISC): Validation of a 10-item measure of resilience. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*, *20*(6), 1019–1028. https://doi.org/10.1002/jts.20271

Connor, K. M., & Davidson, J. R. (2003). Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). *Depression and anxiety*, *18*(2), 76–82. https://doi.org/10.1002/da.10113

Eidmann, A., Kamawal, Y., Luedemann, M., Raab, P., Rudert, M., & Stratos, I. (2023). Demographics and etiology for lower extremity amputations—experiences of a university orthopedic center in Germany. *Medicina*, *59*(2), 200. https://doi.org/10.3390/medicina59020200

Gai, L. (2025). Athletic Identity. In *The ECPH Encyclopedia of Psychology* (pp. 87–87). Springer. https://doi.org/10.1007/978-981-97-7874-4_892

Griffet, J. (2016). Amputation and prosthesis fitting in pediatric patients. *Orthopaedics & Traumatology: Surgery & Research*, *102*(1), S161-S175. https://doi.org/10.1016/j.otsr.2015.03.020

Hall, M. J., Cummings, D. R., Welling Jr, R. I., Kaleta, M. K., Koenig Jr, K. D., Laine, J. C., & Morgan, S. J. (2020). Essentials of pediatric prosthetics. *Journal of the Pediatric Orthopedic Society of North America*, *2*(3), 168. https://doi.org/10.55275/JPOSNA-2020-168

Horsch, A., Gleichauf, S., Lehner, B., Ghandour, M., Koch, J., Alimusaj, M., Renkawitz, T., & Putz, C. (2022). Lower-limb amputation in children and adolescents—a rare encounter with unique and special challenges. *Children*, *9*(7), 1004. https://doi.org/10.3390/children9071004

Jasim, I. M., & Al-Jubouri, M. B. (2025). Quality of Work Life and Resilience among Intensive Care Unit Nurses: A Descriptive Study. *International Journal of Body, Mind & Culture*, *12*(5), 138–144. https://doi.org/10.61838/ijbmc.v12i5.936

Maffoni, M., Casati, A., Tambussi, C., Torlaschi, V., Baldini, M., Dragoni, R., Fundarò, C., Bagnara, L., Ferretti, C., & Pierobon, A. (2025). Psychological and Behavioral Adjustment in Patients with Non-Traumatic Lower Limb Amputation and Prosthesis: A Mixed-Method Triangulation Study. *Journal of Clinical Medicine*, *14*(19), 6973. https://doi.org/10.3390/jcm14196973

Marmot, M. (2005). Social determinants of health inequalities. *The Lancet*, *365*(9464), 1099–1104. https://doi.org/10.1016/S0140-6736(05)71146-6

Masten, A. S. (2021). Resilience in developmental systems. *Multisystemic resilience*(2021), 113–134. https://doi.org/10.1093/oso/9780190095888.003.0007

Mithila, T. J. (2022). *Level of resilience of amputation patient: a cross-sectional study*, Bangladesh Health Professions Institute, Faculty of Medicine, the University …]. http://202.4.109.28:8080/xmlui/handle/123456789/975

Mohammed, Q. Q. (2023). Association between Parental Treatment and Aggressive Behaviors among Adolescent Students. *Iraqi National Journal of Nursing Specialties*, *36*(1), 36–42. https://doi.org/10.58897/injns.v36i1.717

Molina, C. S., & Faulk, J. (2019). Lower extremity amputation. https://pubmed.ncbi.nlm.nih.gov/31536201/

Olusola, I. K., Mathias, O. O., Ajibola, O. B., & Morhasson-Bello, J. O. Limb Amputation In Under-18 Years: A Tertiary Hospital Experience. DOI: 10.9790/0853-2405050106

Organization, W. H., & Staff, W. H. O. (2013). *Global tuberculosis report 2013*. World Health Organization. https://www.who.int/publications/i/item/9789241564656

Saadoon, N. Y. (2017). Evaluation of adolescents' quality of life in Hilla city. *Iraqi National Journal of Nursing Specialties*, *30*(1), 145-155. https://doi.org/10.58897/injns.v30i1.261

Shalash, A., & Mousa, A. M. (2024). Effect of instructional intervention on the knowledge of spinal cord injury patients regarding dietary regimen. *Malaysian Journal of Public Health Medicine*, *24*(2), 103–115. https://doi.org/10.20935/AcadMed7548

Shawq, A. H., Ajil, Z. W., & Al-Musawi, K. M. (2020). Attitudes of mothers towards over-the-counter antibiotics for their children in Baghdad city—International *Journal of Psychosocial Rehabilitation*, *24*(09).
https://doi.org/10.61841/7q72d084

Steinberg, L. (2015). How to improve the health of American adolescents. *Perspectives on Psychological Science*, *10*(6), 711–715. https://doi.org/10.1177/1745691615598510

Wadi, A. A., & Ajil, Z. W. (2025). Parental Stress Levels Among Parents of Children with ADHD: A Cross-Sectional Study in Iraq. *International Journal of Body, Mind & Culture*, *12*(6), 191-197. https://doi.org/10.61838/ijbmc.v12i6.1102

Zheng, X., Lu, X., Chen, Y., Wang, J., & Qiao, J. (2024). Ultrasonographic features and risk factors of postoperative lower limb deep venous thrombosis in patients with lower limb fractures. *Acta Orthopaedica Belgica*, *90*, 665–671. https://doi.org/10.52628/90.4.12834

Zukerman, N., Bottone, E., Low, M., & Ogourtsova, T. (2024). Resilience and adolescence-transition in youth with developmental disabilities and their families: a scoping review. *Frontiers in rehabilitation sciences*, *5*, 1341740. https://doi.org/10.3389/fresc.2024.1341740