

Research Article

Risk Factors for Post-Traumatic Stress Disorder among Young Syrian Refugee Children in Jordan

Mohamed Sellouti^{1*}, Hariri El Mehdi², Jaouad Nguadi³ and Aomar Agadr¹

¹Department of Pediatrics, Mohammed V Military Teaching Hospital, Rabat, Morocco

²Department of Pedodontics, Mohammed V Military Teaching Hospital, Rabat, Morocco

³Department of Cardiology, Mohammed V Military Teaching Hospital, Rabat, Morocco

Abstract

Background: Although millions of the world's children, who account for most of the world's refugees, there are few studies which investigate mental wellbeing of young children living in the camps of Syrian refugees in Zaatari.

Methods: A prospective, descriptive study was conducted at Moroccan military medical-surgical field hospital in Syrian refugee camp in Zaatari over a 3 month period from January 1st, 2015 till March 31st 2015. The sample in this study is comprised 200 syriens children 3 to 6 years of age, lived in Daraa in the south of syria and exposed to daily war-related trauma. Mothers were interviewed using the following instruments: Arabic version of the PTSD questionnaire and Spence Children's Anxiety Scale.

Results: PTSD was diagnosed in 42% of war-exposed children (n=82). This prevalence was higher in young female compared with males (P=0.001). Children with PTSD exhibited multiple posttraumatic symptoms and substantial developmental regression. Children with PTSD have more pronounced psychological and behavioral problems (r=0.29; P < 0.001) compared to the children without PTSD.

Conclusion: Young children exposed to wartime trauma are a risk of

developing a severe posttraumatic profile and more psychological and behavioral problems, which highlights the need to establish programs for this children to enhance refugee children's mental health.

Introduction

Syrian war which in its ninth year now is an armed conflict in progress. It begins in the context of the Arab Spring with predominantly peaceful demonstrations in favor of democracy against the regime, syrien citizens have been exposed to extraordinary physical, psychological and emotional challenges.

Due to these challenges, the majority of syrien face and may suffer from varying aspects of a range of psychological disorders; but children, due to the neurological system, are even more sensitive and susceptible to shocks.

Overpowering evidence exists that refugees have an increased prevalence of mental disorders, including Post-Traumatic Stress Disorder (PTSD), depression and anxiety [1]. Child and adolescent refugees, who account for more than half of the world's refugees, have a higher prevalence of mental disorders than children and adolescents who are not refugees [2]. Impaired psychological health in refugee children and adolescents can be largely attributed to war experiences, stresses in transition such as detention, postmigration stressors and acculturation difficulties [3].

Many studies showed high rates of PTSD and depression among young children of concentration camps [4]. Studies conducted in Palestine, Lebanon, Iraq and Syria have shown increased rates of Post-Traumatic Stress Disorder (PTSD), depression, anxiety disorders and enuresis among refugee minors [5-8].

It is now well established from a variety of studies that traumatic events related to war had a negative impact on individual well-being in all ages, especially children [9].

The aim of this study is to understand the effect of war and related traumatic events on the psychological well-being of child survivors. We also aimed to investigate the relationship between war trauma, anxiety and PTSD among preschool children.

Methods

Participants and procedure

A prospective, descriptive study was conducted at Moroccan military medical-surgical field hospital in syrian refugee camp in Zaatari over a 3 month period from January 1st, 2015 till March 31st, 2015.

Zaatari is a refugee camp in Jordan, located some kilometers south of the border with Syria. It is the world's largest camp for Syrian refugees. It was first opened on July 2012 to host Syrians fleeing the violence in the ongoing Syrian Civil War that erupted in March 2011.

*Corresponding author: Mohamed Sellouti, Department of Pediatrics, Mohammed V Military Teaching Hospital, Rabat, Morocco, Tel: +212660627466; E-mail:msellouti@gmail.com

Citation: Sellouti M, Mehdi EH, Nguadi J, Agadr A (2020) Risk Factors for Post-Traumatic Stress Disorder among Young Syrian Refugee Children in Jordan. J Neonatol Clin Pediatr 7: 056.

Received: August 05, 2020; **Accepted:** August 10, 2020; **Published:** August 18, 2020

Copyright: © 2020 Sellouti M, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

The camp sheltered 78,357 refugees from Syria in October 2018, of whom nearly 20% were under five years old.

Cases were recruited at the time of the pediatric consultation of during the study period. It was planned to reach all of the children between ages 3 to 6. Mothers of the selected children received a written form to sign explaining the study purpose and stressing that the data will be kept with the researchers for scientific research and their confidentiality and that of their children, was ensured. The mothers were interviewed by nurses inside the hospital with interview lasting 30 minutes. Research documents were sent to parents by teachers. We excluded eight forms because of missing data.

Instruments

General demographic questionnaire: Designed for the purpose of this study which included general demographic data: Gender, age, number of siblings, area of residence and monthly family income.

Child PTSD Symptoms Scale (CPSS): Post-Traumatic Stress Disorder (PTSD) is an anxiety disorder that may result from a strong emotional reaction to an extraordinarily stressful event [10]. The scale measures the frequency of symptoms of stress disorders, addressing how often a child has suffered from a particular symptom over the past two weeks prior to the date of data collection. Using a 4-point scale ranging from 0 = not at all to 3 = five or more times a week, mothers rated the frequency with which the child demonstrated each of the 17 items, corresponding to the DSM-IV PTSD symptoms. Respondents rate the frequency of occurrence of 17 items, which results in a scale ranging from 0 to 68 (the higher the score, the more severe are the symptoms of PTSD) [11].

Spence Children's Anxiety Scale (SCAS): A specialized version of the test (The Preschool Anxiety Scale) was adapted from the Spence Children's Anxiety Scale (SCAS) by Spence [12]. The Arabic version of the scale was used in the current study consisted of a list of 28 items that describe anxiety in preschool children. The preschool SCAS has a maximum score of 112, with the following items: Generalized anxiety [1,4,8,13], social anxiety [2,5,11,14-16], separation anxiety [6,12,17-19], obsessive-compulsive disorder [3,9,20-22] and personal injury fear [7,10,23-27]. The parent should answer all the items as well as she/he can, even if some do not seem to apply to her/his child. Each question on the test addresses the frequency of certain anxiety symptoms, measured on a 0-3 scale from "never", "sometimes", "often" to "always".

Statistical Analysis

Statistical analyses were performed using SPSS version. The χ^2 test was used for the comparison of the proportions. Multivariate analysis using binary logistic regression was used to determine factors associated with moderate to severe PTSD. $P < 0.05$ was considered statistically significant.

Results

Characteristics of the sample

A total of 200 young syrien refugee were included in the main analysis of this study s (20% males and 80% females). Age of participants ranged from 3 to 6 years with a mean (SD) of 3.5 (1.5). The length of stay in Jordan was 13-24 years for 50% of children. Almost all cases were living with their parents, while four children

were separated from their parents and were living with their relatives. Table 1 shows the socio-demographic characteristics of Syrian children.

Characteristics	Number	Percentage
Age (years)		
3-4	75	37.5
5-6	125	62.5
Gender		
Boys	40	20
Girls	160	80
Sibling		
4 and less	60	30
5-7	78	39
8 and more	62	31
Family monthly income (dollar)		
Less than 200	64	32
200-300	90	45
300 and more	46	23
length of stay in jordan (month)		
3-6	38	29
7-12	43	21
13-24	119	50
Having relatives in Jordan		
Yes	99	49.5
Non	101	50.5
Fathers education		
Primary school	49	24.5
High school	100	50
University	51	25.5
Mothers education		
Primary school	93	46.5
High school	79	39.5
University	28	14

Table 1: Demographic and clinical characteristics of the young children.

Prevalence of PTSD

Results showed that n=84 children (42%) had moderate to severe PTSD. The rate was significantly higher among females compared with males (45.6% vs. 27.5%). The severity of posttraumatic stress disorder among males and females is shown in tab II. The prevalence of moderate to severe PTSD disorder among young Syrian children according to gender and other variables is shown in table 2. Significant differences in total PSTD and subscales according to number of siblings, Mothers' education, Total family income were found.

Risk factors associated with PTSD

Table 3 shows the results of the multiple logistic regression analysis of factors associated with PTSD disorder among young syrian refugees. Compared with male Syrian adolescents, female adolescents were significantly more likely to have moderate to severe PTSD (OR=1.31). The prevalence differ significantly between children according to their family size and housing status (8 and more).

Variable	No to moderate	PTSD	Moderate to severe PTSD	P value	N %
Age (Years)					
3-4	46	61.3	29	38.7	0.0001
5-6	38	30.4	87	69.6	
Gender					
Male	11	27.5	29	72.5	0.038
Female	73	45.6	87	54.4	
Family monthly income					
Less than 200	14	21.9	50	78.1	0.0001
200-300	40	44.4	50	55.6	
300 and more	30	65.2	16	34.8	
Length of stay in Jordan (month)					
3-6	32	84.2	6	15.8	0.0001
7-12	28	65.1	15	34.9	
13-24	24	20.2	95	79.8	
Having relatives in Jordan					
Non	29	28.7	72	71.3	0.0001
Yes	55	55.6	44	44.4	
Sibling					
4 and less	30	50	30	50	0.0001
5-7	42	53.8	36	46.2	
8 and more	12	19.4	50	80.6	
Fathers education					
Primary school	18	36.7	31	63.3	0.57
High school	42	42	58	58	
University	24	47.1	27	52.9	
Mothers education					
Primary school	24	25.8	69	74.2	0.0001
High school	45	57	34	43	
University	15	53.6	13	46.4	

Table 2: Prevalence of PTSD among young children.

Variable	Number =200	OR (IC 95%)	P value
Age (years)			
3-4	75		
5-6	125	2.86 (1.25-6.51)	0.012
Family monthly income (dollars)			
Less than 200	64	3.08 (0.84-11.25)	0.077
200-300	90	3.27 (1.11-9.56)	0.088
300 and more	46		0.03
Length of stay in Jordan (month)			
3-6	38		
7-12	43	0.032 (0.01-0.107)	0.0001
13-24	119	0.15 (0.062-0.39)	0.0001
Sibling			
4 and less	60		
5-7	78	0.49 (0.15-1.60)	0.24
8 and more	62	0.29 (0.08-0.96)	0.04
Having relatives in Jordan			
Yes	99	0.33 (0.14-0.77)	0.011
Non	101		
Gender			
Male	40	1.31 (1.09-3.9)	0.34
Female	160		

Table 3: Multivariate analysis of factors associated with PTSD among Young children Syrian refugees according to the Child Post-traumatic Stress Disorder Symptom Scale.

Relationship between PTSD and anxiety

Pearson correlation test was conducted to find the association between PTSD and anxiety. Results showed that there was significant association between total traumatic events reported by children and total anxiety ($r=0.29$, $p=0.0001$).

Discussion

While the numbers of young children around the world growing up in the wake of armed conflict appear to increase each decade, very little is known about the psychological functioning and mental health illnesses, of young children exposed to war-related trauma over a lengthy period. This study examines the relationship between war trauma, anxiety and PTSD on a large sample of children exposed to war and investigates risk factors facing Syrian refugee kids in Jordan.

The results showed that 42% reported mild to moderate and 58% reported moderate to severe PTSD. Several other studies also reported high rates of PTSD and depression among Palestinian in the Gaza Strip [23], adolescent during Lebanon civil wars [13] and Syrian refugee schoolchildren living in a German camp [14]. On the other hand, this prevalence was higher compared with that among Syrian adolescent refugees residing in Turkey or other countries. We can not generalise our findings to all refugee children because of the sample selection.

Females children compared with males, were more likely to have moderate to severe PTSD. Such findings were inconsistent with previous studies of older children, which suggested that boys were more traumatized than girls [17]. Females are generally more exposed to physical or sexual trauma during wars or conflicts and the psychological impact of such trauma is much more upon females than males, especially in conservative eastern communities. However, traumatic events may influence girls and boys in different ways, The male children move freely and go here and there, but female children connected to their mothers and stay at home [24].

The age group of 5-6 year are more PTSD symptom than the other ages. Studies showed that children under age six rarely possess the verbal ability to relay symptomology associated with previous PTSD diagnostic criteria. Such findings consistent with study data being analyzed which showed that very young children cannot describe traumatic events because their cognitive abilities to appraise the meaning of the traumatic events are not as developed as those of older children. We think that the accumulation of long-lasting traumatic events such as living in a war-torn area, resilience capacities of every person may break down that make it hard to observe unique reactions [15,20,21,25].

This study showed that young children with eight siblings or more were more likely to have moderate to severe PTSD symptoms. Such findings were consistent with a study which found that children who lived with many siblings were more likely to meet the criteria for PTSD diagnostic [18].

Having a less educated father was also a predicting factor for more emotional problems in children. Similar findings were also reported which emphasized the importance of psychosocial well-being of parents on the mental wellbeing of their kids [16]. Fathers with a higher education level may have better-coping strategies or may be more successful in maintaining a supportive milieu that might be protective for their children [26].

Our study showed that there were significant differences in total PTSD according to family monthly income. Total PTSD was more in families with monthly income less than 200 Dollars. The families with high income satisfied positively with different types of traumatic events, because they were able to secure the basic life, but the families with low income have intensified problems in addition to traumatic problems. The current study consistent with the results of Thabet et al that found children coming from families with incomes of less than 300 dollars/month, living in a city, whose parents had less than elementary education were found to suffer more frequently from PTSD [19].

Our results showed that there was significant correlation between total traumatic events reported by children and total anxiety and with total PTSD, which was also consistent with most of the studies conducted on children in Gaza and other areas [22,27].

Conclusion

This study pointed out high prevalence rates of emotional and behavioural problems among young Syrian, years after resettlement in Jordan. Results also showed high exposure rates to severe traumatic events during the war. Despite high rates of psychological problems that may diminish their social functioning, none of the children was able to reach mental health care services due to several barriers. We think that mental health of refugee children is a public health crisis that requires the collaboration of international community and policymakers to support mental health providers in undeveloped countries.

Limitations

It is required to acknowledge several limitations of our study. Mothers were not sufficient for accurately assessing the psychological disorders of their children. Psychological assessment of children requires multiple informants and careful observation of the child. Another limitation of this study was the absence of a suitable control group of unaffected children.

Conflict of Interest Statement

The authors disclosure no conflict of interests.

Informed Consent

Informed consent was obtained from all the parents participated in the study.

References

1. Steel Z, Chey T, Silove D, Marnane C, Bryant RA, et al. (2009) Association of torture and other potentially traumatic events with mental health outcomes among populations exposed to mass conflict and displacement: A systematic review and meta-analysis. *JAMA* 302: 537-549.
2. Bronstein I, Montgomery P (2011) Psychological distress in refugee children: A systematic review. *Clin Child Family Psychol Rev* 14: 44-56.
3. Fazel M, Reed RV, Panter-Brick C, Stein A (2012) Mental health of displaced and refugee children resettled in high-income countries: Risk and protective factors. *Lancet* 379: 266-282.
4. Kinzie JD, Sack WH, Angell RH, Manson S, Rath B (1986) The psychiatric effects of massive trauma on Cambodian children: I. The children. *J Am Acad Child Adolesc Psychiatry* 25: 370-376.
5. Tabet AAM, Tawahina A, el Sarraj E, Vostanis P (2008) Exposure to war trauma and PTSD among parents and children in the Gaza strip. *Eur Child Adolesc Psychiatry* 17: 191-199.
6. Farhood L, Dimassi H, Lehtinen T (2006) Exposure to war-related traumatic events, prevalence of PTSD, and general psychiatric morbidity in a civilian population from Southern Lebanon. *J Transcult Nurs* 17: 333-340.
7. Ahmad A (2008) Posttraumatic stress among children in Kurdistan. *Acta Paediatr* 97: 884-888.
8. Ibrahim H, Hassan CQ (2017) Post-traumatic stress disorder symptoms resulting from torture and other traumatic events among Syrian Kurdish refugees in Kurdistan Region, Iraq. *Front Psychol* 8: 241.
9. Miller KE, Jordans MJ (2016) Determinants of Children's Mental Health in War-Torn Settings: Translating Research Into Action. *Curr Psychiatry Rep* 18: 1-6.
10. King, Daniel W, Leskin, Gregory A, King, et al. (1998) Confirmatory factor analysis of the clinician-administered PTSD scale: Evidence for the dimensionality of posttraumatic stress disorder. *Psychological Assessment* 10: 90-96.
11. In order to be able to use the CPSS in the Yemeni context, two translators (Arabic/English) with a background in psychology translated the questionnaire into Arabic and - for control reasons - back into English.
12. Spence SH, Rapee R (1999) *Preschool anxiety scale (parent report)*. Brisbane, Australia: University of Queensland.
13. Shaar K (2013) Post-traumatic stress disorder in adolescents in Lebanon as wars gained in ferocity: A systematic review. *J Public Health Res* 2: 17.
14. Soykoek S, Mall V, Nehring I, Henningsen P, Aberl S (2017) Post-traumatic stress disorder in Syrian children of a German refugee camp. *Lancet* 389: 903-904.
15. Pynoos R (1990) PTSD in children and adolescent. In: Garfinkle B, Carlson G, Weller B (Eds.). *Psychiatric Disorders in Children and Adolescents*. Pg no: 48-63.
16. Yalın ŞŞ, Uzel BT, Öztürk M, Gözçaçanlar Ö, Yörük GÜ, et al. (2017) Immigration-related mental health disorders in refugees 5-18 years old living in Turkey. *Neuropsychiatr Dis Treat* 13: 2813-2821.
17. Thabet AA, Karim K, Vostanis P (2006) Trauma exposure in pre-school children in a war zone. *Br J Psychiatry* 188: 154-158.
18. Franz L, Angold A, Copeland W, Costello EJ, Goodman NT, et al. (2013) Preschool Anxiety Disorders in Pediatric Primary Care: Prevalence and Comorbidity. *Child Adolesc Psychiatry* 52: 1294-1303.
19. Dawas M, Thabet AA (2017) The relationship between traumatic experience, posttraumatic stress disorder, resilience, and posttraumatic growth among adolescents in Gaza Strip. *Glob J Intellect Dev Disabil* 5: 2017.
20. Dyregrov A, Yule W (2006) A review of PTSD in children. *Child Adolesc Ment Health* 11: 76-184.
21. Green BL, Grace M, Vary MG, Kramer T, Gleser GC, et al. (1994) Children of disaster in the second decade: A 17-year follow-up of Buffalo Creek survivors. *J Am Acad Child Adolesc Psychiatry* 33: 71-79.
22. Edwards SL, Rapee RM, Kennedy S (2010) A prospective examination of risk for anxiety symptoms in preschool aged children. *J Child Psychol Psychiatry* 51: 313-321.
23. Neria Y, Bravova M, Halper JM (2010) Trauma and PTSD among civilians in the Middle East. *PTSD Res Quart* 21: 1-8.
24. Kolltveit S, Lange-Nielsen II, Tabet AAM, Dyregrov A, Pallesen S, et al. (2012) Risk factors for PTSD, anxiety and depression among adolescents in Gaza. *J Trauma Stress* 25: 164-170.
25. El Bedour S, Bensef R, Maruyama GM (1993) Children at risk: psychological coping with war and conflict. *Int J Ment Health* 22: 33-52.

26. Eruyar S, Maltby J, Vostanis P (2018) Mental health problems of Syrian refugee children: The role of parental factors. *Eur Child Adolesc Psychiatry* 27:401-409.
27. Thabet AA, Ashraf AK, Vostanis P (2014) Prevalence of depression and anxiety in preschool children and Palestinian mothers' mental health. *Arab J Psychiatry* 25: 61-70.



- Advances In Industrial Biotechnology | ISSN: 2639-5665
- Advances In Microbiology Research | ISSN: 2689-694X
- Archives Of Surgery And Surgical Education | ISSN: 2689-3126
- Archives Of Urology
- Archives Of Zoological Studies | ISSN: 2640-7779
- Current Trends Medical And Biological Engineering
- International Journal Of Case Reports And Therapeutic Studies | ISSN: 2689-310X
- Journal Of Addiction & Addictive Disorders | ISSN: 2578-7276
- Journal Of Agronomy & Agricultural Science | ISSN: 2689-8292
- Journal Of AIDS Clinical Research & STDs | ISSN: 2572-7370
- Journal Of Alcoholism Drug Abuse & Substance Dependence | ISSN: 2572-9594
- Journal Of Allergy Disorders & Therapy | ISSN: 2470-749X
- Journal Of Alternative Complementary & Integrative Medicine | ISSN: 2470-7562
- Journal Of Alzheimers & Neurodegenerative Diseases | ISSN: 2572-9608
- Journal Of Anesthesia & Clinical Care | ISSN: 2378-8879
- Journal Of Angiology & Vascular Surgery | ISSN: 2572-7397
- Journal Of Animal Research & Veterinary Science | ISSN: 2639-3751
- Journal Of Aquaculture & Fisheries | ISSN: 2576-5523
- Journal Of Atmospheric & Earth Sciences | ISSN: 2689-8780
- Journal Of Biotech Research & Biochemistry
- Journal Of Brain & Neuroscience Research
- Journal Of Cancer Biology & Treatment | ISSN: 2470-7546
- Journal Of Cardiology Study & Research | ISSN: 2640-768X
- Journal Of Cell Biology & Cell Metabolism | ISSN: 2381-1943
- Journal Of Clinical Dermatology & Therapy | ISSN: 2378-8771
- Journal Of Clinical Immunology & Immunotherapy | ISSN: 2378-8844
- Journal Of Clinical Studies & Medical Case Reports | ISSN: 2378-8801
- Journal Of Community Medicine & Public Health Care | ISSN: 2381-1978
- Journal Of Cytology & Tissue Biology | ISSN: 2378-9107
- Journal Of Dairy Research & Technology | ISSN: 2688-9315
- Journal Of Dentistry Oral Health & Cosmesis | ISSN: 2473-6783
- Journal Of Diabetes & Metabolic Disorders | ISSN: 2381-201X
- Journal Of Emergency Medicine Trauma & Surgical Care | ISSN: 2378-8798
- Journal Of Environmental Science Current Research | ISSN: 2643-5020
- Journal Of Food Science & Nutrition | ISSN: 2470-1076
- Journal Of Forensic Legal & Investigative Sciences | ISSN: 2473-733X
- Journal Of Gastroenterology & Hepatology Research | ISSN: 2574-2566
- Journal Of Genetics & Genomic Sciences | ISSN: 2574-2485
- Journal Of Gerontology & Geriatric Medicine | ISSN: 2381-8662
- Journal Of Hematology Blood Transfusion & Disorders | ISSN: 2572-2999
- Journal Of Hospice & Palliative Medical Care
- Journal Of Human Endocrinology | ISSN: 2572-9640
- Journal Of Infectious & Non Infectious Diseases | ISSN: 2381-8654
- Journal Of Internal Medicine & Primary Healthcare | ISSN: 2574-2493
- Journal Of Light & Laser Current Trends
- Journal Of Medicine Study & Research | ISSN: 2639-5657
- Journal Of Modern Chemical Sciences
- Journal Of Nanotechnology Nanomedicine & Nanobiotechnology | ISSN: 2381-2044
- Journal Of Neonatology & Clinical Pediatrics | ISSN: 2378-878X
- Journal Of Nephrology & Renal Therapy | ISSN: 2473-7313
- Journal Of Non Invasive Vascular Investigation | ISSN: 2572-7400
- Journal Of Nuclear Medicine Radiology & Radiation Therapy | ISSN: 2572-7419
- Journal Of Obesity & Weight Loss | ISSN: 2473-7372
- Journal Of Ophthalmology & Clinical Research | ISSN: 2378-8887
- Journal Of Orthopedic Research & Physiotherapy | ISSN: 2381-2052
- Journal Of Otolaryngology Head & Neck Surgery | ISSN: 2573-010X
- Journal Of Pathology Clinical & Medical Research
- Journal Of Pharmacology Pharmaceutics & Pharmacovigilance | ISSN: 2639-5649
- Journal Of Physical Medicine Rehabilitation & Disabilities | ISSN: 2381-8670
- Journal Of Plant Science Current Research | ISSN: 2639-3743
- Journal Of Practical & Professional Nursing | ISSN: 2639-5681
- Journal Of Protein Research & Bioinformatics
- Journal Of Psychiatry Depression & Anxiety | ISSN: 2573-0150
- Journal Of Pulmonary Medicine & Respiratory Research | ISSN: 2573-0177
- Journal Of Reproductive Medicine Gynaecology & Obstetrics | ISSN: 2574-2574
- Journal Of Stem Cells Research Development & Therapy | ISSN: 2381-2060
- Journal Of Surgery Current Trends & Innovations | ISSN: 2578-7284
- Journal Of Toxicology Current Research | ISSN: 2639-3735
- Journal Of Translational Science And Research
- Journal Of Vaccines Research & Vaccination | ISSN: 2573-0193
- Journal Of Virology & Antivirals
- Sports Medicine And Injury Care Journal | ISSN: 2689-8829
- Trends In Anatomy & Physiology | ISSN: 2640-7752

Submit Your Manuscript: <https://www.heraldopenaccess.us/submit-manuscript>