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RESEARCH ARTICLE

TRAUMA CENTER OUTCOMES AMONG ADULTS HOSPITALIZED AFTER TRAUMA AT WOLFSON HOSPITAL: A RETROSPECTIVE OBSERVATIONAL STUDY

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Abstract

Background: Trauma-related injuries requiring emergency department care remain a major cause of mortality, disability, and healthcare utiliza tion worldwide.Trauma centers have reduced preventable mortality, yet outcome variation between hospitals persists. In Israel, national trauma data are centralized by the Gertner Institute. A report received by Wolfson Hospital on August 27, 2017 indicated that mortality among moderately injured patients was threefold higher and among mildly injured patients eightfold higher than that reported for comparable regional trauma centers.

Objective: To examine the associations between injury characteristics, patient characteristics,and multiple in-hospital clinical outcomes among adults hospitalized after trauma at Wolfson Hospital. The study was designed as an analysis of associations with three predefined outcomes - discharge destination, length of hospitalization, and expected recovery level - rather than as a mortality-prediction model. Accordingly, mortality was reported descriptively as an important contextual quality indicator, but it was not specified as the primary dependent variable in the analytical model. Because the cohort contained only 37 in-hospital deaths and the available registry dataset did not provide a sufficient event structure for reliable adjusted mortality modeling, no mortality-specific multivariable model was performed. Injury characteristics included injury type and severity according to the Injury Severity Score (ISS). Patient characteristics included age, sex, body mass index (BMI), chronic diseases, and documented risk factors.

Methods: A retrospective single-center epidemiological study was conducted using the Wolfson Hospital Trauma Unit database for the period January 1 to December 31, 2016. The sample included 1,508 patients aged 18 years or older who were treated in the trauma room and subsequently hospitalized. Patients discharged on the day of admission were excluded. Statistical analysis was performed in SPSS using descriptive statistics and bivariate tests selected according to variable type. Results: Of the patients included, 54.4% were women, the mean age was 66.28 years, and 53.8% were aged 70 years or older. Falls accounted for 69.8% of admissions and road traffic injuries for 16.9%. Mild injuries comprised 56.7% of cases and moderate injuries 38.5%. The overall in-hospital mortality rate was 2.5% (37 patients). Significant associations were observed between chronic diseases, injury type, injury

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severity, and all three study outcomes. Older age was associated with longer hospitalization, with discharge to rehabilitation or nursing facilities, and with differences across expected recovery categories. BMI was associated with length of stay but not with discharge destination or expected recovery level.
Conclusions: Trauma admissions at Wolfson Hospital in 2016 were characterized by an older case mix, a predominance of falls, and substantial associations between comorbidity, injury characteristics, and multiple clinical outcomes. These findings support the need for geriatric-oriented trauma planning, careful management of chronic disease burden, and continued evaluation of trauma outcome indicators in relation to local patient demographics.

Introduction:-

Healthcare systems worldwide continue to face the challenge of treating life-threatening injuries and preventing long-term disability after trauma. According to the World Health Organization, injuries account for approximately 9% of global mortality, while millions of survivors experience prolonged functional impairment and substantial healthcare costs. Trauma centers play a central role in reducing preventable mortality and improving quality of care through timely resuscitation, surgery, monitoring, and coordinated post-acute planning. In Israel, the National Center for Trauma and Emergency Medicine Research at the Gertner Institute monitors national trauma patterns and outcomes. Wolfson Medical Center has participated in this registry since 2008. A report issued to the hospital indicated that mortality among mildly and moderately injured patients was higher than the regional average, prompting the present study. However, the analytical aim of the present work was not to construct a mortality-prediction model. Rather, the study was designed to examine the relationships between patient characteristics, injury characteristics, and three predefined in-hospital outcomes - discharge destination, length of hospitalization, and expected recovery level - among adults hospitalized after trauma at Wolfson Hospital in 2016. The specific gap addressed by this study was the lack of institution-level analysis describing how local patient mix and injury patterns were associated with clinically relevant in-hospital outcomes in this setting. The guiding research question was therefore: which patient and injury characteristics were associated with discharge destination, hospital length of stay, and expected recovery level among adults hospitalized after trauma at Wolfson Hospital in 2016? Mortality is therefore presented as a clinically important descriptive indicator that provided the institutional motivation for the study, but not as the primary modeled endpoint.

Literature Review:-

Trauma Centers:-

Definition of Physical Trauma and Physiological Responses:-

Physical trauma is defined as bodily injury caused by external energy (NIH, 2018). It includes blunt, penetrating, and thermal trauma. Blunt trauma involves objects or forces causing lacerations or fractures, while penetrating trauma involves objects piercing the skin. Following an injury, the body undergoes systemic physiological changes intended for protection, compensation, and eventually, repair and recovery (Leenen, 2013).

Epidemiology of Trauma:-

Global Epidemiology: Road traffic injuries were projected to become the third leading cause of death globally by 2020. Approximately half of all trauma-related deaths occur among individuals aged 15-45 years (Fararoei et al., 2017).

Epidemiology in Israel:-

Reports indicate that approximately one in three Israelis will be hospitalized because of an injury during their lifetime. Between 2010 and 2015, injury rates increased by 8%, largely due to falls and road accidents. Mortality rates rise significantly among patients aged 55 years and older, regardless of injury severity (Peleg et al., 2016).

Historical Background of Trauma Centers:-

Modern trauma systems evolved in response to recognition that survival after severe injury depends not only on the technical quality of hospital treatment but also on rapid triage, coordinated transport, timely surgical capability, intensive monitoring, and rehabilitation planning. The landmark 1966 report Accidental Death and Disability: The Neglected Disease of Modern Society is widely regarded as a turning point in the development of organized trauma care, because it highlighted preventable deaths and catalyzed the creation of emergency medical systems, formal trauma-center designation, and standardized trauma training. Subsequent decades saw increasing emphasis on regionalization, performance measurement, and system-level coordination, all of which shaped the modern

expectation that trauma outcomes should be evaluated not only by case fatality but also by discharge pathways, resource use, and functional recovery.

Quality Indicators:-
Common indicators include hospital mortality, complications, and time to treatment (e.g., CT scan within 1-4 hours). However, because overall survival rates have improved, mortality alone is no longer the sole measure of quality; long-term survival and quality of life are becoming equally important (Gruen et al., 2012).

Trauma Center Grading and Wolfson Hospital:-
Trauma centers are graded Level 1 (Supra-regional), Level 2 (Regional), or Level 3 (General). Wolfson Hospital operates as a Level 2 Regional center. Between 2015-2017, the ER underwent renovations, adding a trauma room with three beds and advanced equipment (FAST, ventilators, etc.). The unit is staffed by a manager, a coordinator, and a dedicated team of surgeons and nurses.

Injury Characteristics: Type and Severity:-
Survival and outcomes are linked to patient demographics (age, sex) and clinical status (GCS, blood pressure). The Injury Severity Score (ISS) is a primary predictor of recovery and discharge destination.

Treatment Outcomes for Trauma Victims:-
Discharge Destination:-
Factors such as pre-injury functional status and social support often determine whether a patient is discharged home or transferred to a rehabilitation or nursing facility.Length of Hospitalization: Older age, chronic illness, and injury severity are well-established predictors of longer hospital stays, whereas the relationship between BMI and duration of hospitalization has been inconsistent across prior trauma studies (Bergeron et al., 2005; Lee et al., 2016).Expected Recovery Level: Although many trauma patients survive, a considerable proportion experience residual disability. Previous studies indicate that injury severity and age are important predictors of whether a patient achieves full recovery or faces long-term functional limitation.

Methodology:-

Study Type:-
A retrospective, single-center epidemiological study was conducted using the Wolfson Hospital Trauma Unit database. The analysis covered all eligible admissions recorded between January 1, 2016, and December 31, 2016. This single-year design provided an institutional snapshot of trauma case-mix and outcomes at Wolfson Hospital, but it was not intended to evaluate temporal trends across multiple years. Reporting of the study was guided by the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) checklist for observational research.

Study Population:-
Total sample: 1,508 patients from the Wolfson Hospital Trauma Unit database. Inclusion: Adults (18+), treated in the trauma room and hospitalized. Exclusion: Patients discharged on the same day as admission.

Research Variables:-
Independent Variables: Patient Characteristics: Age (18-30, 30-50, 50-70, 70-90, 90+), Sex, BMI (Underweight, Normal, Overweight, Obese, Morbidly Obese), Chronic Diseases (0, 1, 2, 3+), Risk Factors. Injury Characteristics: Type (Fall, Road Accident, Violence, Burns, Other), Severity (ISS: 1-6 Mild, 8-14 Moderate, 16-24 Severe, 25-75 Very Severe). Dependent Variables (Outcomes): Discharge Destination: Home, Rehab, Nursing facility, Other hospital, Death. Recovery Level: Full recovery, Mild disability, Severe disability, Not assessed, Death. Length of Hospitalization: Total days.

Research Tools:-
The study was based on routinely collected data from the Wolfson Hospital Trauma Unit registry.

Research Procedure:-
Data were extracted into Excel for initial organization and coding and were subsequently analyzed in SPSS.

Ethics:-
The study was approved by the Institutional Helsinki Committee of Wolfson Medical Center (Appendix 1). The approval reference number was assigned at the time of review but was not available in the manuscript files during preparation of the revised version. Because this was a retrospective registry-based study using existing hospital data, the requirement for individual informed consent was waived where applicable by the reviewing committee.

Statistical Data Processing:-
Data were analyzed using SPSS. Descriptive statistics included frequencies, percentages, means, and standard deviations, as appropriate to variable type. Age and BMI were summarized descriptively and analyzed according to the predefined study categories. Discharge destination and expected recovery level were treated as categorical outcomes, whereas length of hospitalization was analyzed as a continuous outcome measured in days. Bivariate associations were examined using Chi-square tests for categorical variables, independent-samples t-tests for two-group comparisons, Pearson correlations for continuous associations, and F-tests/one-way ANOVA for comparisons involving more than two groups, as appropriate. Statistical significance was set at $p<0.05$, with $p<0.01$ reported where relevant. Analyses were performed on available cases for each variable; missing data were not imputed. In particular, BMI values were incomplete and BMI-related analyses were therefore restricted to patients with documented BMI data. The manuscript was revised with reference to the STROBE checklist to improve transparency in the reporting of design, variables, and analytical procedures. Because of the retrospective exploratory design and the structure of the available registry data, the present study focused on unadjusted associations and did not include multivariable modeling. In addition, although mortality was an important descriptive quality indicator in the institutional background to the study, only 37 deaths were recorded in the cohort and mortality was not prespecified as a primary modeled endpoint. The combination of a limited number of events, single-center scope, and restricted covariate structure in the registry meant that a mortality-specific regression model would have been statistically fragile and potentially misleading. Accordingly, mortality was retained as a descriptive contextual indicator rather than analyzed through adjusted regression. Potential confounding could not therefore be fully controlled, and the findings should be interpreted as exploratory rather than causal.

Findings:-
The findings are presented in two structured sections. Part One summarizes the demographic, clinical, and injury-related profile of the cohort. Part Two reports the bivariate associations between patient and injury characteristics and each of the three predefined outcomes: discharge destination, length of hospitalization, and expected recovery level.

Part One: Patient Characteristics:-
Demographic Characteristics. Among the 1,508 hospitalized trauma patients included in the study, 54.4% were women and 45.6% were men. Approximately one-quarter were aged 50 years or younger, 21.0% were between 50 and 70 years, 45.9% were between 70 and 90 years, and 7.9% were older than 90 years. Age ranged from 18 to 106 years, with a mean of 66.28 years (SD=21.91). Most patients were Jewish (93.8%), Israeli citizens (96.4%), born outside Israel (66.8%), and residents of central Israel (95.3%).

Clinical and Injury Characteristics:-
Most admissions were due to falls (69.8%), followed by road traffic accidents (16.9%), violence (4.2%), and burns (0.1%). With regard to injury severity, 56.7% of patients had mild injuries and 38.5% had moderate injuries, whereas only 4.9% had severe or very severe injuries. Overall in-hospital mortality was 2.5% (37 patients). Approximately three-quarters of patients (75.1%) were discharged home, while about one-fifth were transferred to rehabilitation or nursing facilities. Because mortality events were limited in absolute number and were not prespecified as one of the three modeled outcomes, mortality is presented descriptively here as contextual outcome information rather than as a separate inferential endpoint.

Part Two: Correlations Between Research Variables:-
Association Between Patient and Injury Characteristics and Discharge Destination:-
Clinical and Demographic Characteristics:-
Age: A significant correlation was found between the patient's age and the discharge destination [$F(5,1502)=30.05$, $p<0.01$]. The average age for those discharged home was 62.96, while the average age for those transferred to rehabilitation or nursing facilities was over 75. Sex: A significant correlation was found between gender and discharge destination [$\chi^2(5)=44.41$, $p<0.01$]. The rate of men discharged home (80.5%) was higher than that of

women (70.6%). Conversely, women (25.5%) were transferred to rehabilitation facilities at a higher rate than men (13.4%). BMI: No significant correlation was found between BMI and discharge destination [$\chi^2(10)=15.33$, $p=0.12$]. Risk Factors: A significant correlation was found between the number of risk factors and the discharge destination [$\chi^2(15)=31.85$, $p<0.01$]. Chronic Diseases: A significant correlation was found between the number of chronic diseases and the discharge destination [$\chi^2(15)=108.02$, $p<0.01$]. Most patients without chronic diseases (82.5%) were discharged home compared to those with three or more diseases (67.1%).

Injury Characteristics and Discharge Destination:-

6. Injury Type: A significant correlation was found between the type of injury and the discharge destination [$\chi^2(20)=127.29$, $p<0.01$]. Approximately 25% of fall victims were transferred to rehabilitation compared to 5% of road accident victims. 7. Injury Severity: A significant correlation was found between injury severity and discharge destination [$\chi^2(15)=191.66$, $p<0.01$]. While 85.4% of mildly injured patients were discharged home, only 46.2% of those with very severe injuries were discharged home.

Association Between Patient and Injury Characteristics and Length of Hospitalization (Days):-

Clinical and Demographic Characteristics:-

Age: A significant positive correlation was found between age and length of stay ($r=0.23$, $p<0.01$); as age increases, the duration of hospitalization lengthens. Sex: No significant differences were found between gender and length of stay [$t(1504)=-0.97$, $p=0.33$]. BMI: Significant differences were found in the length of stay between patients with different BMI categories [$F(2, 1212)=3.32$, $p<0.05$]. In the present sample, patients in the normal-weight category had a slightly longer mean hospital stay (M=6.80 days) than patients in the overweight category (M=5.85 days). This finding should be interpreted cautiously because the absolute difference was modest and BMI data were incomplete. Risk Factors: No correlation was found between risk factors and length of stay ($r=-0.01$, $p=0.10$). Chronic Diseases: A significant positive correlation was found between the number of chronic diseases and length of stay ($r=0.14$, $p<0.01$).

Injury Characteristics and Length of Hospitalization:-

6. Injury Type: Significant differences were found [$F(4, 1492)=12.32$, $p<0.01$].

Patients hospitalized due to falls stayed significantly longer (M=6.93 days) than those involved in road accidents (M=4.34 days).7. Injury Severity: Significant differences in average length of stay were found across injury-severity categories [$F(3,1502)=55.73$, $p<0.01$]. Patients with very severe injuries had the longest mean hospital stay (M=17.46 days).

Association Between Patient and Injury Characteristics and Expected Recovery Level:-

Clinical and Demographic Characteristics:-

Age: A significant association was found between age group and expected recovery level [$F(4, 1503)=10.94$, $p<0.01$], indicating meaningful differences in recovery categories across age groups. Sex: No significant correlation was found [$\chi^2(4)=5.66$, $p=0.23$]. BMI: No significant correlation was found [$\chi^2(8)=8.70$, $p=0.37$]. Risk Factors: No significant correlation was found [$\chi^2(12)=17.99$, $p=0.12$]. Chronic Diseases: A significant correlation was found [$\chi^2(12)=95.21$, $p<0.01$]. Specifically, 97.2% of those without chronic diseases were expected to reach full recovery, compared with 79.7% of those with three or more chronic diseases.

Injury Characteristics and Expected Recovery Level:-

6. Injury Type: A significant correlation was found [$\chi^2(16)=27.56$, $p<0.05$]. Those expected to reach full recovery were primarily victims of falls (93.3%) or road accidents (94.5%). 7. Injury Severity: A significant correlation was found between injury severity and expected recovery level [$\chi^2(12)=274.34$, $p<0.01$]. Full recovery was most common among mildly injured patients (95.6%) and least common among very severely injured patients (61.5%).

Summary of Findings. Age, BMI, and injury severity (ISS) were significantly associated with length of hospitalization. Gender, age, chronic diseases, injury type, risk factors, and ISS were significantly associated with discharge destination. Age, chronic diseases, injury type, and ISS were significantly associated with expected recovery level, whereas sex, BMI, and risk factors were not. Overall, chronic diseases and injury characteristics (type and severity) were the only factors that showed significant associations across all three outcomes.

Table 1. Expected Recovery Level by Injury Severity:-

Note. Percentages are presented within injury-severity categories. Recovery categories reflect the clinical status recorded in the trauma registry at discharge or expected disposition review. ISS = Injury Severity Score.

Injury severity	Full recovery	Mild disability	Severe disability	Not assessed	Death
Mild	817 (95.6%)	4 (0.5%)	22 (2.6%)	12 (1.4%)	0
Moderate	540 (93.1%)	4 (0.7%)	17 (2.9%)	19 (3.3%)	0
Severe	50 (83.3%)	1 (1.7%)	6 (10.0%)	3 (5.0%)	0
Very severe	8 (61.5%)	2 (15.4%)	3 (23.1%)	0	0

Table 2. Expected Recovery Level by Chronic Diseases:-

Note. Percentages are presented within chronic-disease categories. Empty cells in the original registry summary were retained as zero where no cases were reported in the corresponding category.

Chronic diseases	Full recovery	Mild disability	Severe disability	Not assessed	Death
None	881 (97.2%)	5 (0.6%)	2 (0.2%)	10 (1.1%)	8 (0.9%)
One	326 (93.4%)	3 (0.9%)	11 (3.2%)	9 (2.6%)	0
Two	145 (83.3%)	0	16 (9.2%)	13 (7.5%)	0
Three or more	63 (79.7%)	1 (1.3%)	8 (10.1%)	7 (8.9%)	0

Table 3. Discharge Destination by Risk Factors:-

Note. Percentages are presented within each risk-factor category. Categories include home, rehabilitation facility, nursing facility, other hospital, death, and other. Small cell counts should be interpreted cautiously.

Risk factors	Home	Rehab facility	Nursing facility	Other hospital	Death	Other
None	968 (74.2%)	271 (20.8%)	17 (1.3%)	5 (0.4%)	35 (2.7%)	9 (0.7%)
One	151 (81.6%)	28 (15.1%)	2 (1.1%)	2 (1.1%)	2 (1.1%)	0
Two	13 (76.5%)	2 (11.8%)	2 (11.8%)	0	0	2 (11.8%)
Three or more	1 (100%)	0	0	0	0	0

Figure 1. Age distribution of the hospitalized trauma cohort (n=1,508). Bars indicate the number of patients in each predefined age group.

Note. Bars represent absolute patient counts in each predefined age category.

Figure 2. Mean length of hospitalization, in days, by injury type. Falls were associated with the longest average stay in the cohort.

Note. Values represent mean hospital length of stay, measured in days, for each injury-type category.

Figure 3. Distribution of expected recovery categories according to injury severity. Higher injury severity was associated with less favorable expected recovery profiles.

Note. Recovery categories include full recovery, mild disability, severe disability, and not assessed; distributions are shown across ISS severity categories.

Figure 4. Mean length of hospitalization, in days, across age groups. Length of stay increased with age, particularly among patients aged 71 years and older.

Note. Values represent mean hospital length of stay in days within each predefined age group.

Figure 5. Distribution of the cohort by injury severity category according to the Injury Severity Score. Most admissions were classified as mild or moderate.

Note. ISS categories were defined as mild (1–6), moderate (8–14), severe (16–24), and very severe (25–75).

Figure 6. Discharge destination by sex. The figure demonstrates a higher proportion of women referred to rehabilitation facilities than men.

Note. Percentages are presented within sex categories across discharge destinations.

Discussion:-

The primary objective of this study was to examine the relationships between trauma injury characteristics, patient characteristics, and multiple clinical outcomes among adults hospitalized at Wolfson Hospital in 2016. The study was undertaken in response to a quality concern raised by the Gertner Institute, which reported unusually high

mortality among mildly and moderately injured patients relative to comparable regional trauma centers. Nevertheless, the present analysis was structured around three predefined in-hospital outcomes - discharge destination, length of stay, and expected recovery level - and should therefore be interpreted as an analysis of associations with multiple outcomes rather than as a formal mortality-prediction study. In addition, because only 37 in-hospital deaths were recorded and the available single-center registry variables were limited, the dataset was not well suited for a stable mortality-specific multivariable model. Any adjusted mortality analysis performed under these conditions would have been vulnerable to sparse-data bias, model instability, and over-interpretation. For that reason, mortality was retained as an important descriptive quality indicator and institutional motivator, but not analyzed as a separate adjusted endpoint. Across the analyses, chronic diseases and injury characteristics emerged as the most consistent correlates of outcome, while age contributed substantially to variation in discharge destination, hospitalization length, and recovery profile. Taken together, these findings suggest that trauma outcome patterns at Wolfson are shaped not only by injury severity but also by an older and medically complex case mix.

Association Between Patient/Injury Characteristics and Discharge Destination:-

Discharge destination. The analysis showed that discharge destination was associated with sex, age, chronic diseases, risk factors, injury type, and injury severity, whereas BMI was not significantly associated with discharge placement. These findings are broadly consistent with international literature showing that discharge disposition after trauma reflects a combination of injury burden, pre-existing morbidity, age-related frailty, and social support rather than injury severity alone. Studies from other settings have likewise reported that older patients and patients with reduced premorbid reserve are less likely to return directly home and are more likely to require rehabilitation or institutional care. In the present cohort, the higher proportion of women referred to rehabilitation should therefore be interpreted cautiously; it may reflect post-discharge support structures and living arrangements in addition to clinical status.

Association Between Patient/Injury Characteristics and Length of Hospitalization:-

Hospitalization. The study found that age, BMI, chronic diseases, injury type, and injury severity were associated with length of stay, whereas sex and documented risk factors were not. This pattern is also compatible with international trauma literature, in which longer hospitalization is commonly linked to older age, greater comorbidity burden, more complex injury profiles, and discharge-planning needs. The finding that normal-weight patients stayed slightly longer than overweight patients in this cohort should not be overinterpreted, because the difference was modest and BMI data were incomplete. Overall, the Wolfson findings reinforce the view that hospital length of stay in trauma populations is influenced by both biological severity and organizational factors related to recovery planning.

Association Between Patient/Injury Characteristics and Expected Recovery Level:-

Recovery Level. Age, chronic diseases, and injury characteristics (type and severity) were significantly associated with expected recovery level, whereas sex, BMI, and risk factors were not significantly associated in the present analysis. Internationally, injury severity is consistently reported as one of the strongest predictors of poorer short-term and long-term recovery, and the current findings are in line with that evidence. Erem et al. (2017) and related trauma outcome studies have shown that more severe injuries are associated with worse functional prognosis and a greater likelihood of residual disability. The strong relationship observed here between chronic disease burden and expected recovery also supports the wider literature indicating that pre-existing morbidity complicates rehabilitation and delays return to baseline status. Unlike the earlier version of this manuscript, the corrected statistical interpretation indicates that age was also significantly associated with expected recovery categories in this dataset. This finding is directionally consistent with international evidence suggesting that older trauma patients are less likely to achieve uncomplicated recovery and are more likely to require prolonged support after acute care. Taken together, these results suggest that recovery expectation, discharge placement, and mortality represent related but distinct dimensions of trauma outcome and should not be interpreted interchangeably.

Comparison with Gertner Institute Reports:-

A descriptive comparison between the present single-center 2016 cohort and the Gertner Institute's aggregated 2010-2015 national trauma reports suggests that the Wolfson population was older and more heavily dominated by falls. These differences may plausibly contribute to variation in discharge patterns, hospitalization length, and crude mortality. At the same time, the comparison must remain cautious. The present study did not include directly matched comparison groups, standardized mortality ratios, or multivariable risk adjustment, and the registry variables available for analysis did not permit case-mix standardization at the level required for a formal benchmark

assessment. Accordingly, the Gertner comparison should be read as contextual and hypothesis-generating rather than as evidence of confirmed excess risk attributable to institutional performance alone. A more definitive assessment of mortality differences would require a larger multi-year or multicenter dataset with standardized severity adjustment and explicitly prespecified mortality modeling.

Study Limitations:-

This study should be interpreted in light of several limitations. First, the retrospective single-center observational design limits causal inference and may be affected by incomplete or inconsistently documented registry variables. Second, the study covered only one calendar year and therefore provides a cross-sectional institutional snapshot rather than a multi-year trend analysis. Third, BMI data were incomplete, and analyses involving BMI were necessarily restricted to available cases. Fourth, the analytical approach was based on unadjusted bivariate associations and did not include multivariable models; residual confounding therefore cannot be excluded. Fifth, mortality, although important to the institutional background of the study, was not analyzed as a formal dependent variable in a separate regression model. This reflected both the original design of the study and the relatively small number of in-hospital deaths (n=37), which limited the feasibility of a stable mortality-specific multivariable analysis within the available dataset. In addition, the registry did not contain the breadth of covariates needed for robust adjustment of mortality risk in a small-event sample. Sixth, the comparison with Gertner Institute reports was descriptive only and was not based on directly matched populations, standardized mortality ratios, or multivariable risk adjustment. Finally, potentially important variables such as baseline functional status, frailty, social support, and organizational factors were not available in the database and therefore could not be included in the analysis.

Conclusions:-

The findings of this study indicate that discharge destination, length of hospitalization, and expected recovery level are influenced not only by injury severity but also by patient age, comorbidity burden, and the local demographic case mix. Chronic diseases and injury characteristics emerged as the most consistent correlates across the three outcomes examined, while age showed meaningful associations with all three non-mortality outcome domains assessed analytically in the study. The higher proportion of women discharged to rehabilitation should not automatically be interpreted as poorer biological recovery; it may also reflect differences in household support and post-discharge care arrangements. The markedly older and more fall-prone trauma population treated at Wolfson may contribute to differences between local outcomes and broader regional reports; however, this inference remains provisional because no risk-adjusted benchmark comparison was performed and no mortality-specific model was estimated in the present dataset. From a service-planning perspective, these results support the need for geriatric-sensitive trauma pathways, proactive discharge planning, and continued evaluation of trauma quality indicators in settings serving older and medically complex populations. Future work would be strengthened by multi-year data, broader functional and social variables, and risk-adjusted analyses that permit more rigorous institutional benchmarking, including prespecified mortality analysis in adequately powered datasets.

Publication Status Statement:-

The authors confirm that this manuscript has not been published previously, is not under consideration for publication elsewhere, and has not been posted as a preprint on any public platform.

Bibliography:-

1. (Note: Hebrew sources have been transliterated/translated for consistency)
2. Ministry of Health. (2011). Criteria for Recognition of a Trauma Center (Circular No. 2/2011). [Hebrew].
3. Moskovich-Barkai, G., & Givon, A. (2016). Trauma injuries in Israel 2010-2015: Report to the nation 2016. Gertner Institute. [Hebrew].
4. Peleg, K., Moskovich-Barkai, G., Givon, A., & Goldman, S. (2011). A decade of trauma injuries in Israel 2000-2009: Report to the nation 2011. Gertner Institute. [Hebrew].
5. Peleg, K., Moskovich-Barkai, G., & Givon, A. (2016). Trauma injury in Israel 2010-2015: Report to the nation 2016. Gertner Institute. [Hebrew].
6. Bergeron, E., Lavoie, A., Moore, L., Clas, D., & Rossignol, M. (2005). Comorbidity and age are both independent predictors of length of hospitalization in trauma patients. Canadian Journal of Surgery, 48(5), 361-366.

7. Boyd, J. M., Moore, L., Atenufu, E. G., Hamid, J. S., Nathens, A., & Stelfox, H. T. (2017). A retrospective cohort study of the relationship between quality indicator measurement and patient outcomes in adult trauma centers in the United States. Injury, 48, 13-19.
8. Chabok, S. Y., Yardanshenas, H., Naeeni, A. F., Ziabakhsh, A., Bidar, S. S., Reihanian, A., & Bazargan-Hejazi, S. (2014). The impact of body mass index on treatment outcomes among traumatic brain injury patients in intensive care units. European Journal of Trauma and Emergency Surgery, 40(1), 51-55.
9. Chen, A. Y., Zagorski, B., Parsons, D., Vander Laan, R., Chan, V., & Colantonio, A. (2012). Factors associated with discharge destination from acute care after acquired brain injury in Ontario, Canada. BMC Neurology, 12, 16.
10. Chiang, W.-K., Huang, S.-T., Chang, W.-H., Huang, M.-Y., Chien, D.-K., & Tsai, C.-H. (2012). Mortality factors regarding the injury severity score in elderly trauma patients. International Journal of Gerontology, 6, 192-195.
11. Cooper, G., & Laskowski-Jones, L. (2006). Development of trauma care systems. Prehospital Emergency Care, 10(3), 328-331.
12. Davidson, G. H., Hamlat, C. A., Rivara, F. P., Koepsell, T. D., Jurkovich, G. J., & Arbabi, S. (2011). Long-term survival of adult trauma patients. JAMA, 305(10), 1001-1007.
13. Erem, G., Bugeza, S., & Malwadde, E. K. (2017). Outcome at two weeks in patients with traumatic brain injury following road traffic accidents in an urban tertiary hospital in Uganda. Cogent Medicine, 4, 1326205.
14. Fararoei, M., Sadat, S. J., & Zoladl, M. (2017). Epidemiology of trauma in patients admitted to an emergency ward in Yasuj. Trauma Monthly, 22(3), e30572.
15. Gabbe, B. J., Braaf, S., Fitzgerald, M., et al. (2015). RESTORE: Recovery after serious trauma outcomes, resource use, and patient experiences study protocol. Injury Prevention, 21(5), 348-354.
16. Gruen, R. L., Gabbe, B. J., Stelfox, H. T., & Cameron, P. A. (2012). Indicators of the quality of trauma care and the performance of trauma systems. British Journal of Surgery, 99(Suppl. 1), 97-104.
17. Hwabejire, J. O., Kaafarani, H. M. A., Imam, A. M., et al. (2013). Excessively long hospital stays after trauma are not related to the severity of illness: Let's aim to the right target! JAMA Surgery, 148(10), 956-961.
18. Hildreth, A. N., Martin, R. S., & Meredith, J. W. (2013). Introduction to trauma care. In The Trauma Manual: Trauma and Acute Care Surgery (4th ed.). Lippincott Williams & Wilkins.
19. Kuhne, C. A., Ruchholtz, S., Kaiser, G. M., & Nast-Kolb, D. (2005). Mortality in severely injured elderly trauma patients: when does age become a risk factor? World Journal of Surgery, 29, 1476-1482.
20. Leenen, L. P. H. (2013). Physiological response to injury. In The Trauma Manual: Trauma and Acute Care Surgery (4th ed.). Lippincott Williams & Wilkins.
21. National Library of Medicine. (2023). Wounds and injuries. Medical Subject Headings (MeSH).
22. Ong, A. W., Omert, L. A., Vido, D., Goodman, B. M., Protetch, J., Rodriguez, A., & Jeremitsky, E. (2009). Characteristics and outcomes of trauma patients with ICU lengths of stay 30 days and greater: A seven-year retrospective study. Critical Care, 13(5), R154.
23. Recker, A., Putt, R., & Broome, E. (2018). Factors impacting discharge destination from acute care for patients with traumatic brain injury: A systematic review. Journal of Acute Care Physical Therapy, 9(1), 35-45.
24. Sleet, D. A., Dahlberg, L. L., Basavaraju, S. V., et al. (2011). Injury prevention, violence prevention, and trauma care: Building the scientific base. MMWR Supplement, 60(4), 78-85.
25. Stelfox, H. T., Bobranska-Artiuch, B., Nathens, A., & Straus, S. E. (2010). Quality indicators for evaluating trauma care: a scoping review. Archives of Surgery, 145(3), 286-295.
26. World Health Organization. (2014). Injuries and Violence: The Facts 2014. Geneva, Switzerland.
27. Zarshenas, S., Colantonio, A., Parsons, D., et al. (2017). Predictors of discharge destination from acute care in patients with traumatic brain injury: A systematic review protocol. BMJ Open, 7, e016694.