MENTAL HEALTH DISORDERS IMPACT U.S. NAVY SHIPBOARD PERSONNEL, 2016–2020

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NMR&D NAVY MEDICINE RESEARCH & DEVELOPMENT

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BACKGROUND

Mental health (MH) disorders significantly impact military readiness, retention, and operational effectiveness. Sea duty sailors face unique stressors including:

- Prolonged confinement in confined quarters
- Disrupted sleep due to rotating watch schedules
- Limited privacy and restricted family communication
- Potential stigma around help-seeking behavior

Despite growing recognition, comprehensive population-level data on shipboard MH events have been limited. Prior studies show >50% of shipboard personnel screened positive for depression and suicide risk.

OBJECTIVES

1. Determine prevalence of MH diagnosis in the fleet
2. Assess whether MH prevalence is affected by hull type, occupation, and demographics
3. Identify MH limited duty (LIMDU) and medical evacuation (MEDEVAC) rates
4. Determine return to duty (RTD) rate of MH cases
5. Evaluate effects of embedded MH providers on fleet MH rates

METHODS

Study Population

- 101,981 active duty Navy sailors assigned to 160 ships across nine hull types (Aircraft Carrier [CVN], Amphibious Assault Ship [LHA/LHD], Amphibious Transport Dock [LPD], Landing Ship Dock [LSD], Guided Missile Cruiser [CG], Guided Missile Destroyer [DDG], Littoral Combat Ship [LCS], and Mine Countermeasures [MCM])

Retrospective Cohort Design

- Descriptive statistics with chi-square tests
- Three separate multivariable binomial regression models (MH Visit, MH LIMDU, MH MEDEVAC)
- All analyses conducted in SAS v9.4

MH Outcome Definitions

- MH Visit: General shipboard or ashore encounter with MH diagnosis (ICD-10-CM)
- MH LIMDU: Cases resulting in limited duty with tracking in the LIMDU Sailor and Marine Readiness Tracker System (SMART) database
- MH MEDEVAC: Events requiring medical evacuation from the ship

RESULTS

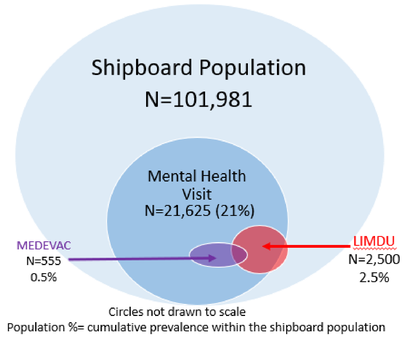


Figure 1. Venn Diagram of Mental Health Events

Table 1. Mental Health Event Prevalence, by Hull Type

Hull Type	MH Support		Avg MH Monthly Visit Rate	MH Visits		MH LIMDU		MH MEDEVAC	
	Chaplain	MH Provider(s)		n	%	n	%	n	%
CVN	Yes	Yes	1.70%	7999	37	636	25	116	21
LHA	Yes	Yes	1.40%	513	2	69	3	10	2
LHD	Yes	Yes	2.30%	2422	11	244	10	63	11
LPD	Yes	No	2.70%	1522	7	203	8	44	8
LSD	Yes	No	2.30%	1140	5	126	5	30	5
CG	No	No	2.60%	1252	6	156	6	39	7
DDG	Yes	No	2.40%	6132	28	967	39	229	41
LCS	No	No	2.10%	475	2	61	2	4	1
MCM	No	No	1.70%	170	1	38	2	20	4

Table 2. Top Mental Health Diagnoses for LIMDU and MEDEVAC Cases

LIMDU (n=2500)	Percentage	MEDEVAC (n=555)	Percentage
Depressive disorders	36%	Suicide and intentional self-inflicted injury	31%
Adjustment disorders	32%	Adjustment disorders	23%
Posttraumatic stress syndrome	12%	Depressive disorders	13%

Table 3. Mental Health Monthly Average Rate, by Hull Type by Year

Hull Type	2016	2017	2018	2019	2020
CVN	1.30%	1.58%	1.79%	1.78%	1.82%
LHA	1.06%	1.01%	1.15%	1.78%	2.02%
LHD	1.49%	2.05%	2.34%	2.79%	2.89%
LPD	1.95%	2.36%	2.89%	3.37%	3.05%
CG	2.31%	1.88%	2.06%	2.73%	2.38%
LSD	2.35%	2.54%	2.41%	2.53%	2.94%
DDG	1.83%	2.21%	2.78%	2.68%	2.53%
LCS	1.13%	1.79%	2.36%	2.64%	2.45%
MCM	1.26%	1.47%	1.92%	1.66%	2.01%
Avg	1.63%	1.88%	2.19%	2.44%	2.45%

Mental Health Life Cycle

- 21% of shipboard sailors engage in MH services at some point.
- 2.5% of shipboard sailors are place on LIMDU for MH.
  - 99% of MH LIMDU have one diagnosis code as the reason.
  - 99% of MH LIMDU show only one period of LIMDU.
  - LIMDU SMART shows 42% RTD, but separatee data show 58% of those cases have a separation file within months of LIMDU RTD.
    - 8% retired
    - 10% drugs or commission of offense
    - 41% completion of service term
    - 12% disability retirement
- 0.5% of shipboard sailors are medevacked for MH.
  - 78% separated
    - 35% unqualified for active duty
    - 19% drugs and or commission of offense
    - 11% disability retirement
    - 10% completion of service term
    - 1% retirement

Overall results suggest that **12%** of MH LIMDU/MEDEVAC cases "actually" **RTD**.

Table 4. Mental Health Event Binomial Regressions

		MH Visit†			MH LIMDU‡			MH MEDEVAC‡		
		RR	95% CI		RR	95% CI		RR	95% CI	
Sex	Male	Ref			Ref			Ref		
	Female	1.27	1.24	1.3	2.09	1.93	2.27	1	0.83	1.2
Education	High school	Ref			Ref			Ref		
	Some college	1.02	0.97	1.06	1.07	0.92	1.24	0.9	0.6	1.35
	College degree	0.96	0.91	1.01	0.46	0.39	0.54	0.8	0.53	1.23
Hull type	CVN	Ref			Ref			Ref		
	LHA	0.79	0.73	0.85	1.5	1.17	1.92	1.4	0.74	2.65
	LHD	1.28	1.23	1.33	1.68	1.45	1.95	1.86	1.36	2.53
	LPD	1.36	1.31	1.42	2.28	1.94	2.67	1.83	1.26	2.64
	LSD	1.27	1.21	1.33	1.82	1.5	2.2	1.8	1.2	2.72
	CG	1.18	1.12	1.24	1.91	1.61	2.28	2.09	1.43	3.04
	DDG	1.29	1.26	1.33	2.59	2.34	2.86	2.57	2.04	3.23
	LCS	1.22	1.13	1.31	2.09	1.6	2.73	0.82	0.3	2.23
	MCM	0.85	0.74	0.96	2.4	1.72	3.34	7.46	4.68	11.89
Age, years	18–24	Ref			Ref			Ref		
	25–29	0.9	0.87	0.93	1.1	0.98	1.22	0.75	0.58	
	30–34	0.84	0.8	0.87	0.93	0.8	1.07	0.43	0.28	
	35–39	0.95	0.9	0.99	1.21	1.03	1.43	0.6	0.38	
	40–59	0.92	0.86	0.98	0.97	0.76	1.24	0.65	0.35	
Sea duty service experience	≤1	Ref			≤2	Ref		Ref		
	2 years	0.58	0.57	0.6	>2	0.25	0.22	0.27	0.59	0.47
	3 years	0.34	0.33	0.36						
	4 years	0.18	0.17	0.2						
	≥5	0.11	0.1	0.12						
Occupation	Infantry, Gun, Seamanship	Ref								
	Electronic Equipment Repairers	1.16	1.12	1.21						
	Communications and Intelligence	1.02	0.97	1.07						
	Health Care	1.28	1.2	1.36						
	Other Technical	0.69	0.49	0.97						
	Functional Support and Admin	1.03	0.98	1.09						
	Electrical/Mech Equip Repairers	1.09	1.05	1.13						
	Craftsworkers	1.15	1.08	1.22						
	Service and Supply Handlers	1.21	1.16	1.27						
	Non-Occupational Enlisted	1.01	0.94	1.08						
	Tactical Operations Officers	0.22	0.19	0.27						
	Intelligence Officers	0.41	0.27	0.64						
	Engineering and Maint Officers	0.71	0.56	0.9						
	Scientists and Professionals	0.24	0.14	0.41						
	Health Care Officers	0.34	0.24	0.48						
	Administrators	0.35	0.24	0.51						
	Supply and Procurement Officers	0.47	0.36	0.61						
	Non-Occupational Officers	0.22	0.18	0.27						
	Unknown	0.79	0.69	0.91						

†MH visits compared with the whole population.

‡LIMDU and MEDEVAC compared with the MH visit population.

RR, risk ratio

RECOMMENDATIONS

Targeted Screening & Prevention

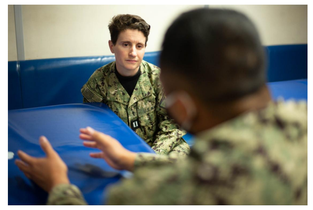
- Enhance MH screening for depressive disorders and suicidality for junior, female, and first-term sailors prior to first sea duty assignment
- Implement targeted MH and leadership training for supervisors of newly assigned shipboard sailors

Resource Allocation

- Expand embedded MH provider support to high-risk hull types (DDG, LPD, MCM)
- Reduce MH stigma and improve access to care across all hull types

Data & Policy

- Establish a central MEDEVAC tracking database for improved force readiness visibility
- Incorporate chaplain engagement and PHA data into future MH analyses
- Pursue declassification or SECRET-level research access to Optimized Fleet Response Plan data for operational context



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CONCLUSIONS

- ~12% of sailors placed on LIMDU for MH are RTD.
- 1st year at sea is the highest risk for all MH events (MH encounter, LIMDU, MEDEVAC).
- Suicidality is the leading reason for MEDEVAC.
- Depressive disorder is the leading reason for LIMDU and is associated with a high rate of suicidality.
- CVNs have the most MH support and demonstrate one of the lowest risks for sailors experiencing an MH event.
- Compared with men, women have a 27% increased risk of an MH visit and a 209% increased risk of being placed on LIMDU for MH but no significant difference in MH MEDEVAC rates.
- MH services utilization by shipboard sailors has shown an increasing trend over the years.
- Hospital Corpsmen and Culinary Specialists rates have the highest risk of MH issues on ships.
- The LIMDU SMART database does not always align with other data sources, particularly the RTD indicator.