Mental Health Conditions and Hyperthyroidism

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OBJECTIVES: To evaluate the proportion of pediatric patients with concurrent diagnoses of hyperthyroidism and mental health conditions (MHCs) by using the Military Health System database. We hypothesized that the prevalence of mental health disorders would be higher in patients with hyperthyroidism compared with in the nonhyperthyroid population.

METHODS: The prevalence of hyperthyroidism and MHCs was calculated by using data extracted from the Military Health System Data Repository on military beneficiaries between 10 and 18 years old who were eligible to receive care for at least 1 month during fiscal years 2008 through 2016. Prevalence ratios were used to compare MHC diagnoses in those with versus without a diagnosis of hyperthyroidism.

RESULTS: There were 1894 female patients and 585 male patients diagnosed with hyperthyroidism during the study period. Prevalence ratios for MHCs in those with versus without hyperthyroidism ranged from 1.7 (attention-deficit/hyperactivity disorder [ADHD]) to 4.9 (bipolar disorder). Strikingly, suicidality was nearly 5 times more likely in patients diagnosed with hyperthyroidism than in patients who were never diagnosed with hyperthyroidism. For each of the MHCs examined, with the exception of suicidality, the MHC diagnosis was more commonly made before the diagnosis of hyperthyroidism, with the highest proportion of patients being diagnosed with ADHD before receiving a diagnosis of hyperthyroidism (68.3%).

CONCLUSIONS: There is a clear association between hyperthyroidism and each of the following MHCs: ADHD, adjustment disorder, anxiety, bipolar disorder, depression, and suicidality. This study highlights the need to consider this association when evaluating patients with overlapping symptoms and for effective mental health screening tools and resources for clinicians.

WHAT’S KNOWN ON THIS SUBJECT: The current literature regarding mental health and hyperthyroidism in pediatrics consists primarily of case reports, which highlight the presentations of cases in which a patient has a mental health condition and is then found to have newly diagnosed thyroid disease.

WHAT THIS STUDY ADDS: This study evaluates a large population of patients using the Military Health System database. We found a clear association between hyperthyroidism and each of the following: attention-deficit/hyperactivity disorder, adjustment disorder, anxiety, bipolar disorder, depression, and suicidal ideation, self-harm, and/or suicide attempt.


Note: The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, or US Government. I am a military service member. This work was prepared as part of my official duties. Title 17 USC 105 provides that “copyright protection under this title is not available for any work of the US Government.” Title 17 USC 101 defines a US Government work as a work prepared by a military service member or employee of the US Government as part of that person's official duties. Research data were derived from an institutional review board protocol approved by the Naval Medical Center Portsmouth in Virginia (number NMCP.2017.0073). Dr Zader conceptualized the study, drafted the initial manuscript, and reviewed and revised the manuscript; Mr Williams designed the data collection, performed the data analyses, and contributed to the manuscript writing; Dr Buryk conceptualized and designed the study, coordinated and supervised data collection, and critically reviewed the manuscript for important intellectual content; and all authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.
Graves’ disease is the most common cause of hyperthyroidism in children and adolescents, affecting ~0.1 per 100 000 children and 3 per 100 000 adolescents per year.1 The typical symptoms of hyperthyroidism are tachycardia, weight loss despite increased appetite, tremor; restlessness, heat intolerance, and weakness, among others.2 It is not uncommon that children and adolescents presenting with these symptoms are first diagnosed with primary attention-deficit/ hyperactivity disorder (ADHD) or anxiety before the diagnosis of hyperthyroidism is considered.3,4 In anecdotal experience, many patients with hyperthyroidism also express anxiety-related symptoms. If these symptoms were due to the elevation in thyroid hormone alone, it would be expected that these symptoms would resolve with treatment. Often times, treatment of anxiety-related conditions continues well beyond control of clinical hyperthyroidism. Attribution of these symptoms to the thyroid disease itself can lead to delays in seeking mental health care.5 The American Thyroid Association has published comprehensive clinical practice guidelines for management of hyperthyroidism; however, these guidelines do not address the mental health aspect of the disease.6 The paucity of mental health recommendations may be influenced by the limited number of studies that assess the association of mental health diagnoses in this patient population.

Available data from the psychiatric literature demonstrate increased rates of thyroid disease in patients with known underlying psychiatric illness.7 It has been estimated that ~40% to 80% of children with hyperthyroidism meet criteria for ADHD.8 The literature is rife with case reports and case series of concomitant mental health disorders and hyperthyroidism: presenting as transient psychosis,9 psychotic symptoms 2 months after the diagnosis and treatment of Graves’ disease,10 and a patient with a history of anxiety admitted for a suicide attempt and ultimately found to have Graves’ disease.11

Several of these reports also demonstrate improvement in, but not complete resolution of, psychiatric symptoms after treatment of the underlying thyroid condition. Many of these individuals continued to require monitoring for persistent, albeit less severe, psychiatric symptoms.3,4 There have also been attempts to evaluate the prevalence of neuropsychiatric symptoms in individuals first diagnosed with Graves’ disease through case control studies, with those with higher levels of depression and anxiety being compared with controls.12 Although there is evidence to suggest that these symptoms abate with appropriate treatment of the underlying condition,13 others demonstrate persistence of hyperactive behavior up to 6 months after the start of treatment.14 Although this information provides evidence to support a link between mental health conditions (MHCs) and thyroid disturbances, these studies have mostly consisted of case reports in the pediatric population and a few larger case series in adults.3,9–13

Larger-scale pediatric studies evaluating the presence of mental health diagnoses in patients with hyperthyroidism would be valuable to help inform primary care providers and specialists in their assessment of patients presenting with hyperthyroidism, to provide appropriate mental health services, and to inform guideline creation.

In the current study, we used data obtained through the Military Health System Data Repository (MDR). We hypothesized that the prevalence of mental health disorders would be higher in those diagnosed with hyperthyroidism compared with controls without a hyperthyroidism diagnosis. Our goal was to use these data to inform whether additional screening needs to take place, with the ultimate goal being to achieve an effective screening tool to better serve our children and adolescent patients with hyperthyroidism.

METHODS
The US Department of Defense MDR was the sole source of data for this study. The MDR represents nearly 10 million active beneficiaries, composed of military personnel, retirees, and their families, who receive care within military hospitals and clinics as well as through Tricare, the insurance arm of the Department of Defense, within a vast network of civilian medical facilities throughout the United States. Each beneficiary is a recipient of universal health care benefits with dependable access to care and minimal out-of-pocket costs, which aid in reducing bias associated with barriers to care. All eligible child dependents enrolled in the Military Health System (MHS) have access to care under this system. Although children could receive care under alternative health insurances if dual enrolled, it is expected that only a nominal number of children receive all care outside of the MHS. The MDR contains the most complete collection of data about health care provided to beneficiaries of the MHS, allowing users to capture, validate, and distribute comprehensive MHS data.

Research data were derived from an institutional review board protocol with a waiver of consent approved by the Naval Medical Center Portsmouth in Virginia. All data were deidentified before analysis, and the research was conducted in compliance with federal and state laws, including the Health Insurance Portability and Accountability Act of 1996 and safe harbor guidelines.
Study Population

The MDR was queried over a 9-year-period covering fiscal years (FYs) 2008 through 2016. For inclusion, beneficiaries had to be eligible for care for at least 1 month during this time frame and be between ages 10 and 18. The 1-month enrollment was chosen to allow for a more complete capture of data in a transient population and to remove people who may have been treated at a military treatment facility but were not covered by Tricare. Within any given year under study, there were ~2.5 million eligible children in the MHS. Patients were identified by using all International Classification of Diseases, Ninth Revision (FY 2008–2015) and International Classification of Diseases, 10th Revision (FY 2016) codes for hyperthyroidism, ADHD, anxiety, depression, adjustment disorder, bipolar disorder, and suicidal ideation, self-harm, and/or suicide attempt (SI/SH/SA). To meet inclusion criteria for the above diagnoses, subjects were required to have 2 separate documented outpatient visits coded with the diagnosis or 1 inpatient diagnosis. Each patient was given a unique identifier, called the Electronic Data Interchange Person Number, supplied by the Defense Manpower Data Center. Additionally, if a patient had >1 mental health diagnosis (ie, adjustment disorder and ADHD), the patient was included in both categories. The MHCs evaluated were not mutually exclusive; there could be patients counted across multiple diseases.

Statistical Analysis

The prevalence of hyperthyroidism and each of the evaluated MHCs was assessed independently. The prevalence ratio of each of the studied MHCs was evaluated by comparing the prevalence of the condition in those with hyperthyroidism to the reference standard of children in the MHS without a hyperthyroid diagnosis. The use of the prevalence ratio allowed for comparison of the prevalence of each MHC in those exposed versus unexposed to hyperthyroidism. Prevalence of hyperthyroidism was stratified by age and year of initial diagnosis. The timing of each MHC was categorized as before (<90 days from hyperthyroid diagnosis), concomitant (± 90 days from first recorded hyperthyroid diagnosis), or after (>90 days from hyperthyroid diagnosis; Table 1).

Power Calculation

Comparing 2 proportions, and assuming 13% of unexposed children (without hyperthyroidism) have a mental health diagnosis and 40% of exposed children (with hyperthyroidism) have mental health diagnosis ($\alpha = .05; \beta = .2$) with an equal number of subjects in each exposure group, the target sample size would be 41 subjects in each group. Increasing the ratio between the unexposed and exposed groups yields smaller numbers of subjects needed in the exposed group, with 16 subjects being the minimum number needed in the exposed group.

Sex was assessed for effect modification by comparing the prevalence ratio confidence intervals (CIs) for male and female beneficiaries. If present, stratified prevalence ratios were presented. If absent, sex was assessed for confounding by comparing the crude prevalence ratio CI with the Mantel-Haenszel adjusted prevalence ratio CI. If neither effect modification nor confounding were present, the crude ratio was presented.

Data analysis was performed by using SAS version 9.4 for Windows (SAS Institute, Inc, Cary, NC). $\alpha = .05$ was used to assess for statistical significance.

RESULTS

Prevalence of Hyperthyroidism

A total of 2480 individuals ($n = 1894$; 76% female sex) between the ages of 10 and 18 years with a diagnosis of hyperthyroidism during FYs 2008–2016 were identified. Identified patients were most commonly of female sex and between ages 16 and 18 (Table 2). The prevalence of hyperthyroidism in the time period studied was 0.95 in 1000, which is consistent with reported population prevalence. Yearly prevalence of hyperthyroidism was stable over time (Table 3). Notably, the overall period prevalence is higher (~0.95 per 1000). This can be explained by a relatively constant denominator with a varying numerator, which is reflective of the transient military population.

Prevalence of Specified MHC

The proportion of the studied population with each of the MHCs evaluated is summarized in Table 4. Bipolar disorder and SI/SH/SA were the least commonly diagnosed in the time period studied (1.3% and 1.2%, respectively), and adjustment disorder and ADHD were the most commonly diagnosed (7.4% and 7.6%, respectively). Again, these
Prevalences are consistent with reported population norms.

**Prevalence Ratios**

The prevalence of each of the MHCs queried about was higher in those with a diagnosis of hyperthyroidism than in those without (Table 5). Prevalence ratios ranged from 1.7 (ADHD) to 4.9 (bipolar disorder). Sex was found to be an effect modifier for those with anxiety, bipolar disorder, and depression, with male beneficiaries diagnosed with hyperthyroidism being more likely to be diagnosed with these MHCs than female beneficiaries with a hyperthyroidism diagnosis. Therefore, stratified prevalence ratios were presented for these conditions. Sex was neither an effect modifier nor a confounder in adjustment disorder, ADHD, or SI/SH/SA. Sex-specific prevalence ratios are presented in Table 5. The greatest elevation in prevalence was in male beneficiaries with hyperthyroidism and bipolar disorder (prevalence ratio [PR] 6.7; 95% CI 5.1–8.9). There was no difference in prevalence between male and female sex for patients with adjustment disorder, ADHD, and SI/SH/SA. A significant difference by sex existed for the remaining MHCs (anxiety, bipolar disorder, and depression).

**Timing of Diagnosis**

For each of the MHCs examined, with the exception of SI/SH/SA, the mental health diagnosis was more commonly made before the diagnosis of hyperthyroidism (P < .05), the highest proportion of patients being diagnosed with ADHD before receiving a diagnosis of hyperthyroidism (68.3%). There was no difference in the timing of SI/SH/SA in comparison with the diagnosis of hyperthyroidism. These results are presented in Table 1.

**DISCUSSION**

We found a clear association between the diagnosis of hyperthyroidism and each of the following: SI/SH/SA, depression, bipolar disorder, anxiety, ADHD, and adjustment disorder. Hyperthyroidism was more commonly diagnosed in female beneficiaries (76.4% female sex; 23.6% male sex), which is in keeping with literature demonstrating a female predominance in hyperthyroidism. Each of the MHCs described was also more common in female beneficiaries, with the exception of ADHD. In addition, the relative proportion of our population with each of the described MHCs was similar to reported population standards.

The currently available literature, consisting primarily of case reports, highlights the identification of previously recognized MHCs in the setting of newly found thyroid disease. Compared with previous studies, this study adds the strength of a large data set of patients and the capability to decipher the timing of the mental health diagnosis in relation to the hyperthyroidism diagnosis. Among patients ever diagnosed with hyperthyroidism and 1 of the listed MHCs, our study found that the hyperthyroidism diagnosis more commonly occurred after the mental health diagnosis, with the exception of SI/SH/SA.

Specifically, our study found that SI/SH/SA was nearly 5 times more common in those diagnosed with hyperthyroidism than in those never diagnosed with hyperthyroidism, supporting the findings of existing case studies. These case studies described patients who exhibited suicidal behavior before their diagnosis of hyperthyroidism, corresponding to our 40% of patients not receiving a diagnosis of

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**TABLE 2** Demographics at First Diagnosis of Hyperthyroidism Among MHS Beneficiaries 10 to 18 Years of Age (FY 2008–2016)

<table>
<thead>
<tr>
<th>Demographic</th>
<th>$n$</th>
<th>Percentage of Patients With First Diagnosis of Hyperthyroidism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient age, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>138</td>
<td>5.6</td>
</tr>
<tr>
<td>11</td>
<td>101</td>
<td>4.1</td>
</tr>
<tr>
<td>12</td>
<td>114</td>
<td>4.6</td>
</tr>
<tr>
<td>13</td>
<td>150</td>
<td>6.0</td>
</tr>
<tr>
<td>14</td>
<td>214</td>
<td>8.6</td>
</tr>
<tr>
<td>15</td>
<td>325</td>
<td>13.1</td>
</tr>
<tr>
<td>16</td>
<td>363</td>
<td>14.9</td>
</tr>
<tr>
<td>17</td>
<td>497</td>
<td>20.0</td>
</tr>
<tr>
<td>18</td>
<td>572</td>
<td>23.1</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1894</td>
<td>76.4</td>
</tr>
<tr>
<td>Male</td>
<td>585</td>
<td>23.6</td>
</tr>
</tbody>
</table>

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**TABLE 3** Prevalence of Hyperthyroidism (FY 2008–2016)

<table>
<thead>
<tr>
<th>FY</th>
<th>No. Children With $\geq$ 1 mo of Eligibility per y</th>
<th>No. Children With Hyperthyroidism</th>
<th>Prevalence (per 1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>2,588,976</td>
<td>2,480</td>
<td>0.95</td>
</tr>
<tr>
<td>2008</td>
<td>1,129,086</td>
<td>585</td>
<td>0.52</td>
</tr>
<tr>
<td>2009</td>
<td>1,122,504</td>
<td>637</td>
<td>0.57</td>
</tr>
<tr>
<td>2010</td>
<td>1,113,108</td>
<td>635</td>
<td>0.57</td>
</tr>
<tr>
<td>2011</td>
<td>1,095,952</td>
<td>621</td>
<td>0.57</td>
</tr>
<tr>
<td>2012</td>
<td>1,070,956</td>
<td>577</td>
<td>0.54</td>
</tr>
<tr>
<td>2013</td>
<td>1,053,484</td>
<td>511</td>
<td>0.49</td>
</tr>
<tr>
<td>2014</td>
<td>1,039,175</td>
<td>482</td>
<td>0.47</td>
</tr>
<tr>
<td>2015</td>
<td>1,022,432</td>
<td>515</td>
<td>0.50</td>
</tr>
<tr>
<td>2016</td>
<td>1,018,899</td>
<td>508</td>
<td>0.50</td>
</tr>
</tbody>
</table>
hypothyroidism until after presenting with suicidal behavior. This is perhaps the most concerning of our findings. It is challenging to know when the symptoms of undiagnosed hyperthyroidism amplified an already present MHC leading to suicidality or whether the diagnosis of hyperthyroidism was distressing to the individual to the point that suicidality was considered. This former hypothesis could be further elaborated on by evaluating for prevalence ratios of SI/SH/SA in individuals with other chronic autoimmune conditions. It is also possible that in some of these individuals, there was overlap of more >1 MHC that was compounded by hyperthyroidism. From the perspective of the researchers, preventing SI/SH/SA by early screening for and diagnosis of concomitant MHC and/or hyperthyroidism would be the outcome most necessary to achieve.

Our study also highlighted that ADHD was 2 times more common in those diagnosed with hyperthyroidism than in those never diagnosed with hyperthyroidism, with the majority of patients being diagnosed with hyperthyroidism after receiving a diagnosis of ADHD. This is important because as 1 study highlighted, the lack of recognition of hyperthyroidism can affect the efficacy of the treatment of disorders such as ADHD.4

An additional consideration is that several of the medications used to treat MHCs can affect the thyroid axis. For example, stimulants, such as methylphenidate, can cause a mild decrease in total and free thyroxine. However, these laboratory abnormalities would be more likely to lead to misdiagnosis of hypothyroidism (rather than hyperthyroidism). Lithium has been associated with the development of goiter, hypothyroidism through inhibition of thyroid hormone release, or hyperthyroidism from thyroiditis or Graves’ disease. Tricyclic antidepressants and phenothiazine antipsychotics have demonstrated an association with hypothyroidism in both animal and in vitro studies, a link that is speculated in humans as well through effects on noradrenergic and/or serotonergic systems or through induction of autoimmune hypothyroidism, respectively.20 Quetiapine has been associated with hyperthyroidism in the pediatric population, as described in Danish case reports.21

It is possible, although we did not evaluate for this, that testing of the thyroid axis was most commonly performed in those treated with lithium. Bipolar disorder is the mental health disorder that lithium is most commonly used to treat. Therefore, it is possible that the increased prevalence ratio of bipolar disorder in those with a diagnosis of hyperthyroidism is at least partly explained by increased testing of the thyroid axis in this population.

There are additional limitations of our study that should be considered when interpreting the results. First, our data are extracted from billing codes within medical records. Therefore, we are relying on the initial medical provider to appropriately document the correct diagnosis at the correct time. For example, as stated above, an incorrect diagnosis of hyperthyroidism could be documented if a provider included clinically insignificant elevations in thyroxine or triiodothyronine levels or reductions in thyroid-stimulating hormone beyond laboratory norms. However, the researchers sought to mitigate this by only classifying patients as having hyperthyroidism if the diagnoses were made during at least 2 separate outpatient encounters or once as an inpatient. Additionally, the diagnosis of hyperthyroidism could have been delayed if it was not initially considered and screened by the medical provider. This would have an impact on the recorded timing of diagnoses. Because of the nature of International Classification of

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**TABLE 4** Proportion of MHS Beneficiaries Diagnosed With a Specified MHC Among Beneficiaries 10 to 18 Years Old (FY 2008–2016)

<table>
<thead>
<tr>
<th>Mental Health Diagnosis</th>
<th>n</th>
<th>%</th>
<th>Female Sex, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment disorder</td>
<td>193</td>
<td>7.4</td>
<td>54</td>
</tr>
<tr>
<td>ADHD</td>
<td>198</td>
<td>7.6</td>
<td>31</td>
</tr>
<tr>
<td>Anxiety</td>
<td>126</td>
<td>4.9</td>
<td>59</td>
</tr>
<tr>
<td>Bipolar disorder</td>
<td>33</td>
<td>1.3</td>
<td>53</td>
</tr>
<tr>
<td>Depression</td>
<td>151</td>
<td>5.8</td>
<td>60</td>
</tr>
<tr>
<td>SI/SH/SA</td>
<td>31</td>
<td>1.2</td>
<td>60</td>
</tr>
</tbody>
</table>

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**TABLE 5** Prevalence Ratios of MHCs in Those With Hyperthyroidism Compared With the Reference Population

<table>
<thead>
<tr>
<th>Mental Health Diagnosis</th>
<th>Overall PR (95% CI)</th>
<th>PR Female Beneficiaries (95% CI)</th>
<th>PR Male Beneficiaries (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment disorder</td>
<td>2.5 (2.3–2.7)</td>
<td>2.2 (2.0–2.4)</td>
<td>2.6 (2.2–3.1)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>3.8 (3.4–4.0)</td>
<td>2.9 (2.6–3.2)</td>
<td>4.4 (3.7–5.3)</td>
</tr>
<tr>
<td>ADHD</td>
<td>1.7 (1.5–1.9)</td>
<td>1.9 (1.6–2.2)</td>
<td>2.4 (2.1–2.8)</td>
</tr>
<tr>
<td>Bipolar disorder</td>
<td>4.9 (4.2–5.7)</td>
<td>4.0 (3.5–4.8)</td>
<td>8.7 (5.1–8.9)</td>
</tr>
<tr>
<td>Depression</td>
<td>3.4 (3.2–3.7)</td>
<td>2.7 (2.5–2.9)</td>
<td>4.4 (3.7–5.2)</td>
</tr>
<tr>
<td>SI/SH/SA</td>
<td>4.8 (4.1–5.7)</td>
<td>3.8 (3.2–4.6)</td>
<td>6.1 (4.4–8.5)</td>
</tr>
</tbody>
</table>

* Sex was found to be an effect modifier.
Diseases, Ninth Revision and International Classification of Diseases, 10th Revision coding, the researchers could not distinguish Graves’ disease from other causes of hyperthyroidism. Researchers of this study were not able to manually review each of the patient charts to determine specifics related to the diagnosis or timing. Therefore, both the veracity of the diagnosis itself as well as the timing is subject to documentation. Our study sample was also limited to patients who had full access to health care under military health insurance policies. Therefore, patients with limited access to care were not included in this study; however, this should be a small number given that patients in our health care system have universal coverage for health care. Our data set included a small number of individuals whose sex was identified as “missing,” meaning that their sex could not be identified as male or female when evaluating if sex affected a particular diagnosis. Additionally, a pharmacy review was not completed to look at medications taken for each patient. Therefore, an additional limitation is that medication effects on the thyroid could not be ascertained from our data set. Another potential limitation to consider is the possibility of an ascertainment bias. For example, patients may have been diagnosed with an MHC because of the medical attention they were already receiving by having a diagnosis of hyperthyroidism.

The psychiatry literature emphasizes the importance of ruling out other medical conditions before making a mental health diagnosis. However, our research suggests that potentially both hyperthyroidism and mental health diagnoses can be associated with each other and not necessarily mutually exclusive. We hesitate to imply that hyperthyroidism is causative of mental health disorders, although this could certainly at least partially explain our results. There is likely a multifactorial relationship explaining this association, including but not limited to the overlap in symptoms of hyperthyroidism and many of the MHCs listed leading to misdiagnosis or delayed diagnosis, a new medical diagnosis as a trigger for mental health symptoms, or a biological process (autoimmune or otherwise) that could lead to an MHC. Unfortunately, because of the retrospective nature and data limited to billing codes, we were unable to describe our subjects with detail granular enough to answer these questions. However, future endeavors should be directed to explaining the association between these conditions.

CONCLUSIONS
Our study highlights the increased prevalence of MHCs in patients with a diagnosis of hyperthyroidism as well as the often delayed timing of the hyperthyroidism diagnosis, raising the importance of appropriate screening of patients. Clinicians should seek resources to use during their future encounters with patients with these mental health disorders so that they can better recognize and treat a potential coinciding hyperthyroidism diagnosis. Thyroid disorder should be considered in a patient presenting to their primary care provider with a positive screen result for anxiety or depression or symptoms suggestive of another mental health diagnosis. Most importantly, given the recognition of increased risk of suicide in our patients with hyperthyroidism, future research should be aimed toward determining the most effective screening tool to recognize potential mental health diagnoses in patients with hyperthyroidism.

ABBREVIATIONS
ADHD: attention-deficit/hyperactivity disorder
CI: confidence interval
FY: fiscal year
MDR: Military Health System Data Repository
MHC: mental health condition
MHS: Military Health System
PR: prevalence ratio
SI/SH/SA: suicidal ideation, self-harm, and/or suicide attempt

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