
Research Submission

Life With Migraine: Effects on Relationships, Career, and Finances From the Chronic Migraine Epidemiology and Outcomes (CaMEO) Study

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Objective.—To assess the effects of migraine on important life domains and compare differences between respondents with episodic and chronic migraine and between sexes.

Background.—Migraine is associated with a substantial personal and societal burden and can also affect the interpersonal dynamics, psychological health and well-being, and financial stability of the entire family of the person with migraine.

Methods.—The Chronic Migraine Epidemiology and Outcomes (CaMEO) Study is a prospective, longitudinal, Web-based survey study undertaken between September 2012 and November 2013 in a systematic U.S. sample of people meeting modified *International Classification of Headache Disorders, 3rd edition* migraine criteria: 19,891 respondents were invited to complete the Family Burden Module, which assessed the perceived impact of migraine on family relationships and life, career and finances, and overall health. Respondents were stratified by episodic migraine (<15 headache days/month) and chronic migraine (≥15 headache days/month) and sex for comparisons.

Results.—A total of 13,064 respondents (episodic migraine: 11,944 [91.4%]; chronic migraine: 1120 [8.6%]) provided valid data. Approximately 16.8% of respondents not currently in a romantic relationship (n = 536 of 3189) and 17.8% of those in a relationship but not living together (n = 236 of 1323) indicated that headaches had contributed to relationship problems. Of those in a relationship and living together (n = 8154), 3.2% reported that they chose not to have children, delayed having children or had fewer children because of migraine (n = 260; episodic migraine: n = 193 of 7446 [2.6%]; chronic migraine: n = 67 of 708 [9.5%]; $P < .001$). Of individuals responding to career/finance items (n = 13,061/13,036), 32.7% indicated that headaches negatively affected ≥1 career area (n = 4271; episodic migraine: n = 3617 of 11,942 [30.3%]; chronic migraine: n = 654 of 1119 [58.4%]), and 32.1% endorsed worry about long-term financial security due to migraine (n = 4180; episodic migraine: n = 3539 of 11,920 [29.7%]; chronic migraine: n = 641 of 1116 [57.4%]).

Conclusions.—Migraine can negatively affect many important aspects of life including marital, parenting, romantic and family relationships, career/financial achievement and stability, and overall health. Reported burden was consistently greater among those with chronic migraine than among people with episodic migraine; however, few differences were seen between the sexes.

Key words: Chronic Migraine Epidemiology and Outcomes, migraine, career, finances, health, family

Abbreviations: CM chronic migraine, CaMEO Chronic Migraine Epidemiology and Outcomes, EM episodic migraine, FBM Family Burden Module, ICHD International Classification of Headache Disorders

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INTRODUCTION

It is well established that migraine is associated with a substantial personal and societal burden.¹⁻⁶ Migraine-related disability and impact increase with increased headache day frequency among those with episodic migraine (EM; <15 headache days/month averaged over the previous 3 months), with the greatest burden on average reported by individuals with chronic migraine (CM; ≥15 headache days/month averaged over the previous 3 months).^{4,5} As has been observed with other chronic diseases,⁷⁻⁹ it would be expected that migraine would affect not only the individual with the disease but also the interpersonal dynamics, psychological health and well-being, and financial stability of the entire family.

Indeed, the impact of migraine on family life has been assessed in several studies demonstrating that migraine has adverse effects on family life and social/leisure activities of families, most notably on spouses and children.¹⁰⁻¹⁶ The effect of EM and CM on family life, particularly family activities and relationships, has been assessed in The Chronic Migraine Epidemiology and Outcomes (CaMEO) Study, including from the perspectives of spouses/domestic partners and adolescent children of those with migraine.^{13,17} People with migraine, as well as their partners/spouses, reported

that headache/migraine had myriad negative effects on family life and family members.¹⁷ The reported impact was greatest in families of people with CM.¹⁷ For example, adolescent children of people with CM reported missing group and social activities and major events because of their parent's migraine/headache significantly more frequently than those with parents with EM.¹³ In a separate study, a higher frequency of migraine attacks was associated with a greater negative impact on the global well-being of adolescent children of the proband and a greater impact on their personal future.¹⁵ In populations from the United States and the United Kingdom, people with migraine reported that they were more likely to argue with their children and partners and felt less involved in their children's school and home lives because of migraine.¹¹ In a global study of people with migraine, approximately one half of respondents mentioned negative impacts related to missing important events, avoiding making commitments, the effect migraine had on their sex life, and 44% reported feeling guilty about the impact migraine had on their family.¹⁶

Globally, migraine is also associated with variable but substantial negative personal impacts on education, career, and finances.^{14,18-22} A cross-sectional study conducted in multiple headache centers in Austria demonstrated that approximately 34% of respondents, most

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of whom had episodic (56.4%) or chronic headache (38.3%), reported that their headaches had a negative impact on their careers and 21.5% reported a negative impact on earnings. Interestingly, only about 50% of the respondents felt that work colleagues accepted their headaches, underscoring the headache-associated stigma experienced by people with migraine.²¹ In this study, the higher the headache frequency, the greater the negative impact on, career, and finances.

Smaller, but substantial, impacts were also reported in results from the Eurolight project: approximately 8% of respondents expressed the belief that their headaches had made them less successful in their careers and had reduced their earnings.²⁰ In addition, about 9% of respondents reported that their headaches had interfered with their education.

This analysis of CaMEO Study data sought to quantify and understand the effect of migraine on respondents' lives, including spousal, domestic, and romantic relationships, relationships with children, family life, career, finances, and overall health from the perspective of the individual with migraine. We also assessed their perception of how life would be different if they did not have migraine. Differences between respondents with EM and CM were assessed, as were differences between men and women.

METHODS

Study Design/Study Participants.—The CaMEO Study was a longitudinal, Web-based survey study with cross-sectional modules designed to characterize the impact of migraine in a systematic U.S. sample of people with migraine (ClinicalTrials.gov: NCT01648530).²³ Recruiting and screening phases occurred from September through October 2012, and data collection occurred from September 2012 to November 2013.

From a Web panel of 2.4 million people maintained by Research Now (Plano, TX, USA), 489,537 were invited to participate, 80,783 (16.5%) responded and 58,418 (72.3%) provided valid data. Of these, 16,789 respondents met the criteria for migraine using the validated American Migraine Study/American Migraine Prevalence and Prevention Study (AMPP)^{24,25} diagnostic module, which assesses modified International Classification of Headache Disorders (ICHD)²⁶ migraine criteria, and were eligible for CaMEO Study

participation.^{27,28} A further 3304 people responded after the baseline survey was closed and were considered “over quota.” However, many met study inclusion criteria, including migraine study criteria, and to mitigate the risk of potentially low response rates for the Family Burden Module (FBM), 3219 of the over-quota respondents were invited to participate in the FBM. In total, 19,891 respondents were invited to complete the FBM. For all respondents, voluntary completion of the survey was considered to be evidence of consent by our Institutional Review Board. The study was approved by the Institutional Review Board of the Albert Einstein College of Medicine.

For analysis, respondents were further classified into those meeting criteria for CM or EM using the Silberstein-Lipton modification of the ICHD criteria.^{27,28} Demographic and socioeconomic data and headache characteristics were captured from the Core Module completed by respondents at baseline.

Family Burden Module.—The development of the FBM has been previously described.¹⁷ In brief, the FBM covered 6 constructs of family burden: Reduced Participation in or Enjoyment of Family Activities, Missed/Canceled Events, Spouse/Partner Interactions, Financial Impact, Effect of Parent-Child Interactions on the Child(ren), and Effect of Parent-Child Interactions on the Individual with Migraine. In this analysis, we reviewed items from the CaMEO Proband Module and organized them into the following constructs: the perceived effect of migraine on Romantic Relationships and Children (based on current romantic relationship status), Education and Career, Finances, and questions about Life with Migraine and Overall Health. For “Romantic Relationship” and “Children” items, questions had preformatted response options (Supplementary Table S1), or respondents could also choose not to respond or to provide a free-form “other” response. Respondents were first asked about current romantic relationship status and then branched to different questions based on current status, including not in a relationship; currently in a relationship, but not living together; or in a relationship and living together. Respondents were asked how “headache” had affected certain aspects of their life, but from a respondent’s perspective this was likely to include the total experience of migraine attacks, as well as the impact of headache

days. For analysis purposes, all questions that were not answered with a “Yes/No” response were recast as dichotomous variables (eg, “never caused problems” vs “caused problems,” disagree somewhat/completely vs agree somewhat/completely, “about the same” vs “better/a lot better”).

Respondents were also asked to postulate if and how their life would be different without migraine based on a 3-category response: 1 = about the same, 2 = better, and 3 = a lot better.

Statistical Analyses.—Because the CaMEO study was intended to enable a variety of comparisons of people with EM and CM, no formal sample size calculations were performed. In order to achieve a sample of at least 315 respondents with CM who would complete all study assessments over the course of a year, 489,537 panelists were invited to complete the screening survey based on rates of migraine prevalence and anticipated attrition.

Descriptive statistics were calculated for the overall sample, for EM vs CM subgroups, and for men vs women, using IBM SPSS Statistics for Macintosh (Version 24.0, 2016, IBM Corp, Armonk, NY, USA). As described above, the analysis was undertaken on data groups as categorical variables. For these variables, the chi-squared test was undertaken to assess differences in proportions among subgroups. The chi-squared test was 1-tailed, and $P < .05$ was considered statistically significant.

RESULTS

Study Participants.—Of the 19,891 CaMEO Study respondents meeting modified ICHD-3 criteria for migraine invited to complete the FBM, 13,064 (65.7%) completed the module, including 11,944 respondents (91.4%) with EM and 1120 (8.6%) with CM.²³

Across all respondents with migraine, the mean (SD) age was 41.3 (14.3) years, with the majority of respondents being women ($n = 9708$, 74.3%) and white ($n = 11,015$, 84.6%). The mean (SD) monthly headache day frequencies were 4.9 (6.1) for the total sample, 3.3 (3.2) for EM, and 21.4 (4.9) for CM. Men reported a mean (SD) monthly headache frequency of 4.1 (5.7), whereas women reported 5.1 (6.2). Baseline characteristics, including body mass index, highest level of education achieved, annual household income, and total number

of children, differed significantly between those with EM and those with CM (Table 1). Respondents with EM were less likely than those with CM to be obese (34.2% vs 41.1%; $P < .001$), more likely to have a ≥ 4 -year college degree (43.7% vs 33.4%; $P < .001$), less likely to have an annual household income $< \$25,000$ (17.8% vs 26.6%; $P < .001$), and had a lower mean (SD) number of children (1.5 [1.6] vs 1.7 [1.7]; $P < .001$).

Marital Relationships, Domestic Partnerships, and Romantic Relationships.—The majority of all respondents were in a romantic relationship and living together ($n = 8157$, 62.4%). Of all respondents with EM, 7448 (62.4%) were in a relationship and living together compared with 709 (63.3%) of all respondents with CM.

Of all respondents not in a current relationship, 16.8% indicated that headaches had impacted their ability to establish and/or maintain a relationship (EM, 15.0%; CM, 37.0%; Table 2). Those with CM were more than twice as likely to report that their headaches affected their ability to establish and maintain a relationship as those with EM ($P < .001$).

Of all respondents currently in a relationship but not living together, 17.8% indicated that headaches had an adverse impact on their current relationship (EM, 15.8%; CM, 43.9%). The reported impact on previous relationships was marginally greater, with 20.1% of all respondents in a relationship but not living together, indicating that headaches had caused at least one previous relationship to end or had been a problem but not to the point of breaking up (EM, 18.2%; CM, 47.4%). Those with CM were almost 3 times as likely as those with EM to respond that their headaches affected their current or previous relationships ($P < .001$).

Overall, close to half of all respondents (49.0%) currently in a relationship and living together agreed somewhat/completely that they would be a better partner if they did not have headaches (EM, 46.2%; CM, 78.2%). Respondents with CM were almost twice as likely as those with EM to agree somewhat/completely that they would be a better partner if they did not have headaches ($P < .001$).

Some respondents (3.2%) indicated that they chose not to have children, delayed having children or had fewer children because of migraine. Those with CM were > 3 times as likely to endorse the concept that they chose not to have children, delayed having

Table 1.—Patient Demographics at Baseline†

Characteristic	Total (N, Mean [SD] Monthly Headache Days: 13,064, 4.9 [6.1])	EM (n, Mean [SD] Monthly Headache Days: 11,944, 3.3 [3.2])	CM (n, Mean [SD] Monthly Headache Days: 1120, 21.4 [4.9])	Chi	P	Men (n = 3356)	Women (n = 9708)	Chi	P
Age, y, mean (SD)	41.3 (14.3)	41.3 (14.4)	41.1 (13.2)	0.28‡	.78	42.7 (14.9)	40.7 (14.0)	7.0‡	<.001
Women, n (%)	9708 (74.3)	8811 (73.8)	897 (80.1)	21,425	<.001	—	—	—	—
White, n (%)	11,015 (84.6)	10,041 (84.3)	974 (87.5)	8.11	.004	2912 (87.0)	8103 (83.7)	20.57	<.001
BMI, n (%)									
Underweight	284 (2.5)	255 (2.4)	29 (3.0)	21,564	<.001	33 (1.1)	251 (2.9)	227.05	<.001
Normal	3962 (34.4)	3669 (34.8)	293 (29.9)	—	—	737 (25.4)	3225 (37.4)	—	—
Overweight	3265 (28.3)	3009 (28.6)	256 (26.1)	—	—	1077 (37.1)	2188 (25.4)	—	—
Obese	4007 (34.8)	3604 (34.2)	403 (41.1)	—	—	1055 (36.4)	2952 (34.3)	—	—
Education, n (%)									
<4-year college degree	7470 (57.2)	6724 (56.3)	746 (66.6)	44,464	<.001	1816 (54.1)	5654 (58.2)	17.362	<.001
≥4-year college degree	5594 (42.8)	5220 (43.7)	374 (33.4)	—	—	1540 (45.9)	4054 (41.8)	—	—
Annual household income, n (%)									
<\$25,000	2404 (18.5)	2107 (17.8)	297 (26.6)	84,211	<.001	502 (15.0)	1902 (19.7)	126.73	<.001
\$25,000–\$49,999	3022 (23.3)	2734 (23.1)	288 (25.8)	—	—	668 (20.0)	2354 (24.4)	—	—
\$50,000–\$74,999	2938 (22.6)	2698 (22.8)	240 (21.5)	—	—	730 (21.8)	2208 (22.9)	—	—
\$75,000–\$99,000	2107 (16.2)	1950 (16.4)	157 (14.1)	—	—	650 (19.4)	1457 (15.1)	—	—
≥\$100,000	2503 (19.3)	2369 (20.0)	134 (12.0)	—	—	793 (23.7)	1710 (17.8)	—	—
Current romantic relationship status, n (%)									
Currently not in a relationship	3512 (26.9)	3205 (26.8)	307 (27.4)	0.174	.68	835 (24.9)	2677 (27.6)	9.21	.002
Currently in a relationship	9552 (73.1)	8739 (73.2)	813 (72.6)	—	—	2521 (75.1)	7031 (72.4)	—	—
Cohabitation status if in a relationship									
Not living together	1395 (14.6)	1291 (14.8)	104 (12.8)	2.34	.13	275 (10.9)	1120 (15.9)	37.5	<.001
Living together	8157 (85.4)	7448 (85.2)	709 (87.2)	—	—	2246 (89.1)	5911 (84.1)	—	—
Total number of children, mean (SD)‡	1.5 (1.6)	1.5 (1.6)	1.7 (1.7)	—	—	1.5 (1.6)	1.5 (1.6)	—	—

†Not all respondents provided data for all characteristics; percentages are based on the responses available for each characteristic.

‡Summarized descriptively.

BMI = body mass index; CM = chronic migraine; EM = episodic migraine.

Table 2.—Responses to Romantic Relationship Items, Parenting, and Decisions About Having Children by Current Romantic Relationship Status

Variable	Total (N = 13,064)	EM (n = 11,944)	CM (n = 1120)	P	Men (n = 3356)	Women (n = 9708)	P
Not currently in a romantic relationship, n†	3512	3205	307	—	835	2677	—
Have your headaches impacted your ability to establish and maintain a relationship?, n (%)							
My headaches have never contributed problems in my relationships	2653 (83.2)	2486 (85.0)	167 (63.0)	<.001	606 (82.1)	2047 (83.5)	.37
Headaches a problem, but not to the point of breaking up OR headaches contributed to previous relationship ending	536 (16.8)	438 (15.0)	98 (37.0)	—	132 (17.9)	404 (16.5)	—
In a romantic relationship, not living together, n†	1395	1291	104	—	275	1120	—
How have your headaches impacted this current relationship?, n (%)							
Headaches not a problem in this relationship	1087 (82.2)	1032 (84.2)	55 (56.1)	—	209 (82.0)	878 (82.2)	—
Headaches prevented closer relationship, getting married, or living together OR My headaches are a concern, but coping	236 (17.8)	193 (15.8)	43 (43.9)	<.001	46 (18.0)	190 (17.8)	.93
How have your headaches impacted previous relationships?, n (%)							
Headaches never contributed problems	932 (79.9)	892 (81.8)	40 (52.6)	—	189 (79.4)	743 (80.1)	—
Headaches have caused ≥1 previous relationship to end OR Headaches were a problem, but not to the point of breaking up	234 (20.1)	198 (18.2)	36 (47.4)	<.001	49 (20.6)	185 (19.9)	.82
In a romantic relationship and living together, n†	8157	7448	709	—	2246	5911	—
If I did not have headaches I would be a better partner, n (%)							
Disagree somewhat/completely	4146 (51.0)	3992 (53.8)	154 (21.8)	<.001	1154 (51.6)	2992 (50.8)	.51
Agree somewhat/completely	3981 (49.0)	3430 (46.2)	551 (78.2)	—	1082 (48.4)	2899 (49.2)	—
Did not have children, delayed having children or had fewer children because of headaches, n (%)							
No	7760 (96.8)	7131 (97.4)	629 (90.4)	—	2121 (96.6)	5639 (96.8)	—
Yes	260 (3.2)	193 (2.6)	67 (9.6)	<.001	75 (3.4)	185 (3.2)	.59
If I did not have headaches I would be a better parent, n (%)							
Disagree somewhat/completely	3677 (61.4)	3464 (64.3)	213 (35.2)	<.001	928 (62.6)	2749 (61.0)	.25
Agree somewhat/completely	2315 (38.6)	1923 (35.7)	392 (64.8)	—	554 (37.4)	1761 (39.0)	—

†Not all respondents answered all questions or answered questions with the preformatted responses; percentages based on number of respondents who answered questions. CM = chronic migraine; EM = episodic migraine.

Table 3.—Responses to Career and Education Items†

Respondents Answering “Yes,” n (%)	Total (N = 13,061)	EM (n = 11,942)	CM (n = 1119)	P	Men (n = 3355)	Women (n = 9706)	P
Question: In which ways, if any, have your headaches affected your job?							
I can't work	659 (5.0)	495 (4.1)	164 (14.7)	<.001	188 (5.6)	471 (4.9)	.087
I missed a promotion	137 (1.0)	104 (0.9)	33 (2.9)	<.001	62 (1.8)	75 (0.8)	<.001
My career advancement has been limited	408 (3.1)	300 (2.5)	108 (9.7)	<.001	128 (3.8)	280 (2.9)	.008
Earned less/missed a raise/have lower salary	477 (3.7)	356 (3.0)	121 (10.8)	<.001	120 (3.6)	357 (3.7)	.79
Retired early	242 (1.9)	197 (1.6)	45 (4.0)	<.001	89 (2.7)	153 (1.6)	<.001
Reduced number of hours worked	1688 (12.9)	1430 (12.0)	258 (23.1)	<.001	378 (11.3)	1310 (13.5)	.001
Chose less demanding work	904 (6.9)	747 (6.3)	157 (14.0)	<.001	233 (6.9)	671 (6.9)	.95
Changed jobs/careers	430 (3.3)	331 (2.8)	99 (8.8)	<.001	111 (3.3)	319 (3.3)	.95
Felt a burden to coworkers	959 (7.3)	789 (6.6)	170 (15.2)	<.001	237 (7.1)	722 (7.4)	.47
Lower job performance ratings	621 (4.8)	495 (4.1)	126 (11.3)	<.001	187 (5.6)	434 (4.5)	.01
Unable to get additional education	310 (2.4)	236 (2.0)	74 (6.6)	<.001	75 (2.2)	235 (2.4)	.54
Unable to get job training	194 (1.5)	144 (1.2)	50 (4.5)	<.001	61 (1.8)	133 (1.4)	.06
My headaches have not affected my career	8790 (67.3)	8325 (69.7)	465 (41.6)	<.001	2331 (69.5)	6459 (66.5)	.002

†Respondents could be currently working or not. They were instructed to endorse all responses that applied; bold values indicate the significantly greater value for ease of interpretation; not all respondents endorsed responses for Career Items.
 CM = chronic migraine; EM = episodic migraine.

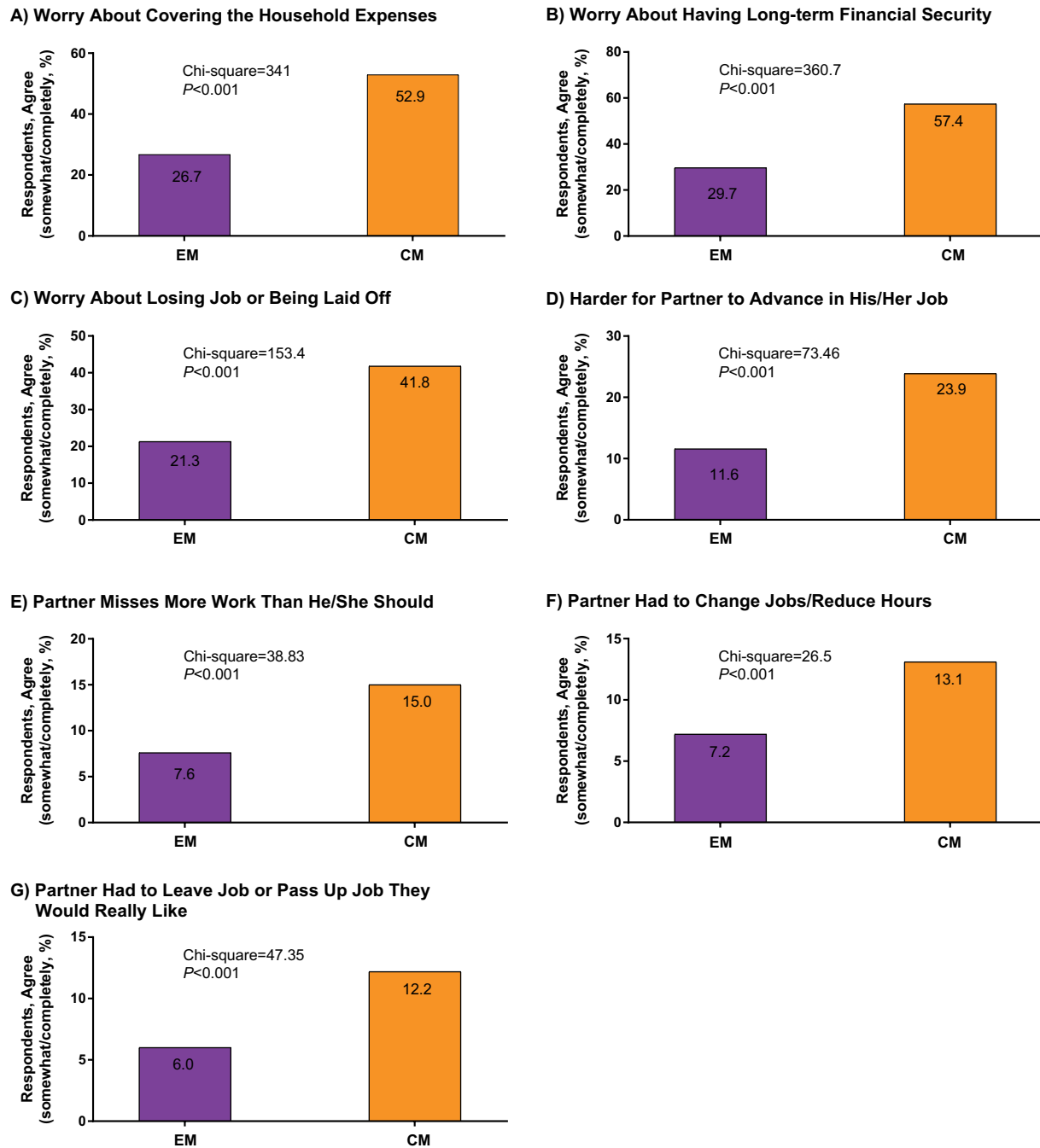


Fig. 1.—Responses to finance questions relating to worry *due to migraine* about (A) covering household expenses, (B) having long-term financial security, (C) losing their job or being laid off, (D) harder for partner to advance in his/her job, (E) partner misses more work than he/she should, (F) partner had to change jobs/reduce hours, and (G) partner had to leave job or pass up a job they would really like, for respondents with CM vs EM. Chronic migraine (CM); episodic migraine (EM). [Color figure can be viewed at wileyonlinelibrary.com]

children or had fewer children because of migraine (EM, 2.6%; CM, 9.6%; $P < .001$).

Children.—Of the 5992 respondents with children living at home (EM, $n = 5387$; CM, $n = 605$), 38.6%

agreed somewhat/completely that they would be a better parent if they did not have migraine (EM, 35.7%; CM, 64.8%). Respondents with CM were nearly twice as likely to agree somewhat/completely

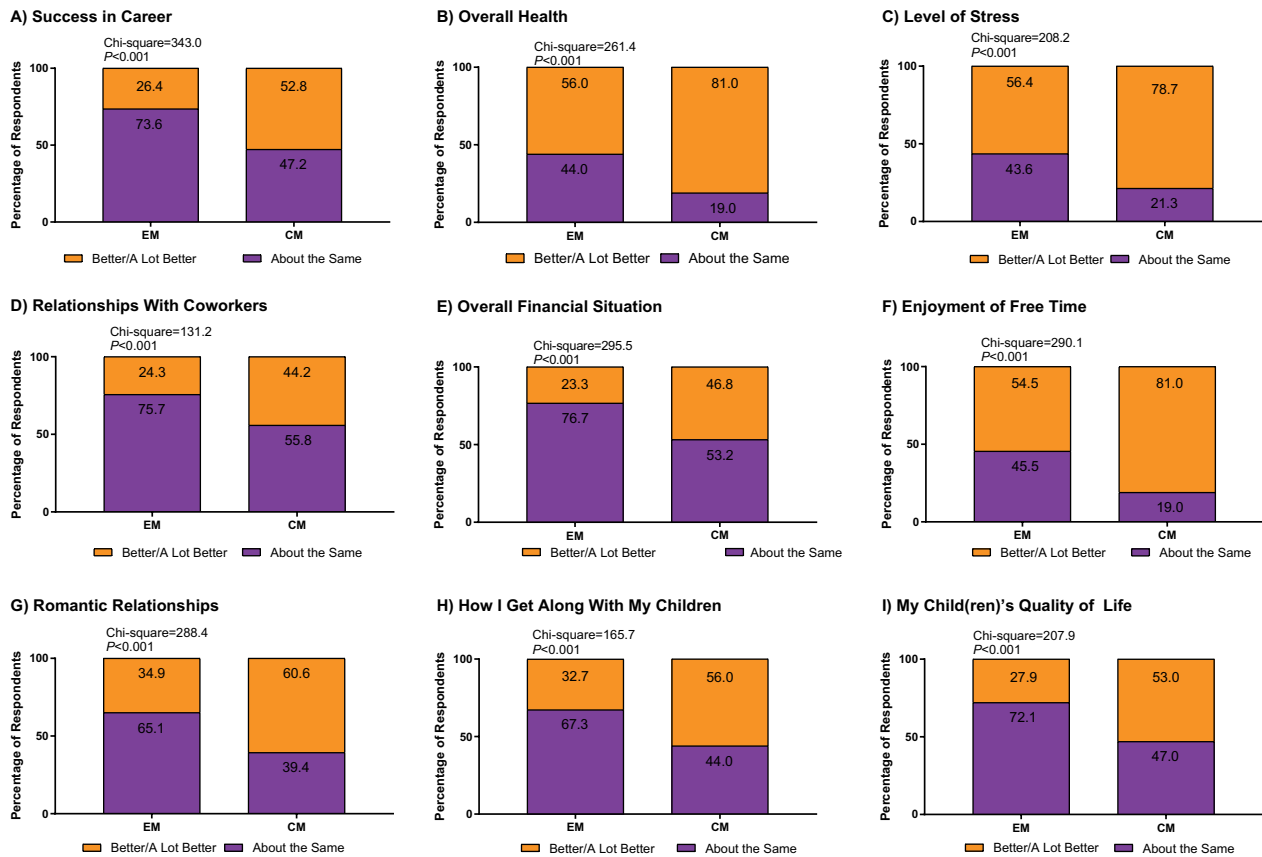


Fig. 2.—Responses to question “Please think about how life would be for you if you had no headaches. Assuming nothing else changed, except that you no longer had headaches: How would your life be different if you had NO headache?” in the following areas: (A) career success, (B) overall health, (C) level of stress, (D) relationships with coworkers, (E) overall financial situation, (F) enjoyment of free time, (G) romantic relationships; and if the respondent has children, (H) relationships with children, and (I) children’s quality of life, for respondents with CM vs EM. Chronic migraine (CM); episodic migraine (EM). [Color figure can be viewed at wileyonlinelibrary.com]

that they would be a better parent without migraine as those with EM ($P < .001$).

Career.—Of the 13,061 individuals who responded to the items regarding their career, 32.7% indicated that migraine had affected at least one item in the career construct (EM, 30.3%; CM, 58.4%). Respondents with CM were typically 2-3 times as likely to agree that migraine had affected various items related to their career as those with EM ($P < .001$; Table 3). Women were slightly more likely than men to agree that migraine had affected their career (women, 33.5%; men, 30.5%; $P = .002$).

Finance.—Overall, 28.9% of respondents reported worry about covering household expenses (EM, 26.7%; CM, 52.9%; $P < .001$), 32.1% reported worry about long-term financial security (EM, 29.7%; CM, 57.4%;

$P < .001$), and 22.8% reported worry about losing their job or being laid off due to migraine (EM, 21.3%; CM, 41.8%; $P < .001$; Fig. 1A-C). Overall, 6.5%-12.6% of respondents also indicated that their headaches had affected their partner’s career, including 6.0%-11.6% of respondents with EM and 12.2%-23.9% of respondents with CM ($P < .001$; Fig. 1D-G). Across all finance items, CM respondents were approximately twice as likely to report that their migraine had a detrimental effect on their partner’s career.

Life With Migraine.—When asked if their life would be better, assuming nothing else changed, if they did not have headaches, results varied. For example, 25.4% of all respondents endorsed the concept that their overall financial situation would be better or a lot better and 58.3% of respondents

felt that their level of stress would be better or a lot better if they did not have migraine. Respondents with CM were 1.4-2.0 times as likely to report that various aspects of life would be better or a lot better without migraine as those with EM ($P < .001$; Fig. 2, Supplementary Table S2). Across the 9 “Life with Migraine” items, 69.6% of EM respondents and 87.7% of CM respondents said that their life would be better or a lot better in at least one area if they did not have migraine. In the absence of migraine, 30.6% of those with EM and 60.2% of those with CM felt they would have improvement across at least 5 life-with-migraine areas (Supplementary Table S2).

Overall Health.—Overall, 47.4% of respondents reported that they had very good or excellent health, and 16.4% reported poor or fair health (EM, 49.7% and 14.2%, respectively; CM, 22.9% and 40.5%). Respondents with CM were significantly less likely to consider they had very good or excellent health than those with EM ($P < .001$). The difference between men and women was much smaller (men, 49.2%; women, 46.7%; $P = .006$) than the difference between CM and EM.

DISCUSSION

The negative effect of migraine on the life of people with migraine and their families has long been known by individuals with migraine and their healthcare professionals and has been previously quantified in a small number of studies.^{10-12,15,16} However, the CaMEO Study is, to our knowledge, the largest study reporting the impact on several important areas of functioning, including family, relationships, career, and educational attainment and finances. Our results quantify the effect of migraine on individuals across a range of domestic and romantic relationships, parenting, finance, educational attainment, and career domains, including perceived effects on spouses/partners' careers and finances, illustrating the far-reaching, detrimental effect of the disease. Research in other disease states had demonstrated that the impact of chronic illness can extend beyond the individual to family members.²⁹⁻³¹ For example, chronic obstructive pulmonary disease,³² diabetes,^{33,34} and mental illness^{35,36} can all have a negative impact on family well-being, including individuals other than the proband.

Across all constructs assessed, migraine was reported to have a negative effect on an individual's life.

For example, 15%-20% of respondents indicated that headaches (the term used throughout the questionnaires, but from a respondent's perspective was likely to include headache and other symptoms of migraine attacks) had a detrimental effect on their relationships. Approximately half of all respondents believed they would be a better parent if they did not have migraine, and one-third indicated migraine had a negative impact on their career and that they worried about their long-term financial security because of the effects of migraine.

Respondents endorsed the idea that migraine had a detrimental effect on marital/domestic partner relationships, complementing the findings of a previous telephone survey that reported adverse effects up to and including separation (5%) or divorce (5%).¹² We found that nearly half of all people with migraine and living with a spouse or partner felt they would be a better partner if they did not have migraine, an even greater percentage than the 36% reported in an earlier telephone survey,¹¹ which may reflect a difference in survey methodology, smaller sample size in the earlier study, or a greater current awareness of the effect of migraine.

Our results related to career and finance were consistent with those reported by others.^{14,18-22} More than one-third of all respondents in this current analysis indicated that migraine had affected their careers. Women were somewhat more likely to agree that migraine had affected their careers, and respondents with CM were 2-3 times as likely as those with EM to report that migraine affected career-related items. Similarly, about one-third of respondents reported worrying about their finances, such as covering household expenses and long-term financial security. Respondents with CM were about twice as likely as those with EM to report concerns with finances. More than 20% of respondents overall reported worrying about job loss because of migraine. Again, respondents with CM were twice as likely to express job-related concerns. Respondents with migraine also indicated that their migraines had detrimental effects on their partner's career.

Previously, when people were asked what it would be like to not live with migraine, verbatim responses noted that freedom from migraine would have a positive effect on many aspects of life and improve quality of life.¹⁰ In our quantitative analysis, respondents similarly reported their perception that

life without migraine would improve many aspects of life, with 30% of those with EM and 60% of those with CM indicating that their life would improve across ≥ 5 areas. As headache day/month frequency increased, respondents were increasingly likely to report that life would be better without migraine (Supplementary Table S3). Across all constructs, those with CM were typically 2-3 times as likely to report a detrimental effect of migraine on their lives as those with EM. Similarly, as headache day/month frequency increased, respondents were more likely to report a detrimental effect of migraine on relationships (Supplementary Table S4) and on long-term financial security (Supplementary Table S5). This is consistent with previous findings from the CaMEO Study, in which the effects on family members were correlated with headache day/month frequency.¹⁷ In the majority of cases, we did not find any significant differences between male and female respondents. Men were more likely to endorse concerns about the effects of migraine on career, and women were more likely to postulate that their overall health and stress would be better without migraine.

Similarly, the global My Migraine Voice survey assessed the real-world burden and impact of migraine among people with at least 4 migraine days per month in the previous 3 months for whom preventive treatments had failed, and found positive correlations between the number of medication failures and disease burden.¹⁶ Those with at least 2 treatment failures were significantly more likely than those with 1 treatment failure to report greater functional and emotional impact of migraine in several areas, including often or always feeling hopeless or helpless due to migraine (47% vs 38%), migraine interfering with daily activities “a lot” or “constantly” (57% vs 48%), and having ever canceled plans because of migraine (83% vs 75%; $P < .05$ for all). Finally, 75% of those with 2 or more treatment failures reported that migraine had negatively affected their professional life vs 60% of those with no treatment failures ($P < .05$). These results highlight the importance of reliable effective treatment to mitigate the negative impact of migraine on important aspects of life.

Finally, compared to the general U.S. population, in which 9.5% of people reported their health to be fair or poor,³⁷ 14.2% of people with EM, and 40.5%

of those with CM reported fair or poor overall health compared with other people their age.

The strengths and limitations of the CaMEO Study in general²³ and the FBM¹⁷ in particular have been previously described. Although survey items in the FBM have not been validated, they were developed through a robust process including literature review, focus groups involving people with migraine and their family members, and consultation with clinical experts. All data are based on self-report; there is no validation of data from medical or employment records. Further, the migraine status and frequency of headaches in spouses/partners and adolescent children of people with migraine were not measured, and the impact of these factors are not included in the analysis. Such information, if available, would be valuable and add further to our understanding of the impact of migraine on family members. Nonresponse from the Web-based survey may result in selection bias, which is an important potential limitation of our study. However, analysis of respondents and a sample of nonrespondents²³ and comparison of the CaMEO and AMPP Study respondents³⁸ found no evidence of such bias. Therefore, our results should be generalizable to people with migraine in the United States. To our knowledge, the FBM of the CaMEO Study is the largest study undertaken to date to assess the impact of migraine across relationships, family life, career, finances, and overall health.

CONCLUSIONS

CaMEO Study respondents with migraine reported that headaches negatively affected many important areas of their lives and perceived that their lives would be better or a lot better without migraine. Respondents reported that headaches contributed to relationship problems and had a detrimental effect on family life, including a small percentage reporting the choice to delay having children or having fewer children or no children at all because of migraine. Similarly, they reported that migraine had a negative impact on career and financial achievements, including perceived negative effects on their spouse's/partner's careers. Across all constructs, detrimental effects increased with increasing headache day/month frequency, with the greatest burden reported by those with CM.

In light of these findings, we recommend that healthcare professionals caring for individuals with migraine ensure that they have an understanding of the overall burden of disease on the individual and their families. Furthermore, these findings reinforce the importance of optimal management of migraine. Individuals should be accurately diagnosed, and once diagnosed, provided with all appropriate education and pharmacologic and nonpharmacologic interventions. Building on the results of other analyses of CaMEO data from the family member perspective,¹⁷ we also recommend that education be extended to family members to help them understand the burden of disease, including the effect on them personally, and to support individuals with migraine to adhere to lifestyle and treatment plans to achieve treatment goals. Furthermore, given that individuals with high-frequency headache, including those with CM, experience significantly more disability than individuals with lower frequency EM, it is critical that healthcare professionals diagnose and optimally manage EM as well to potentially avoid many of these negative disease consequences.

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SUPPORTING INFORMATION

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