Awareness of Individual Cardiovascular Risk Factors and Self-Perception of Cardiovascular Risk in Women

Jean-Jacques Monsuez, MD, PhD, Tai Pham, MD, Nicole Karam, MD, Laurence Amar, MD, Corinne Chicheportiche-Ayache, MD, Philippe Menasché, MD, PhD, Michel Desnos, MD, PhD, Paul Dardel, MD and Isabelle Weill

ABSTRACT

Background: Cardiovascular risk factors (CVRFs) self-perception by women may be inaccurate.

Materials and Methods: A questionnaire was completed anonymously Online by women who self-reported their personal CVRF levels including age, weight, contraceptive use, menopausal status, smoking, diet and physical activities. Self-perceived risk was matched to actual cardiovascular risk according to the Framingham score.

Results: Among 5,240 young and middle-aged women with a high educational level, knowledge of personal CVRFs increased with age, from 51-90% for blood pressure (BP), 22-45% for blood glucose and 15-47% for blood cholesterol levels, between 30 and 65 years, respectively. This knowledge was lower for smoking compared with nonsmoking women: 62.5% vs. 74.5% for BP ($P < 0.001$), 22.7% vs. 33.8% for blood glucose ($P < 0.001$), 21.9% vs. 32.0% for cholesterol levels ($P < 0.001$). Knowledge of BP level was reduced among women using an estrogen-progestogen contraception (56.8% vs. 62.1%, $P = 0.0031$) and even more reduced among smokers (52.2%, $P < 0.001$). Conversely, women with leisure-time physical or sportive activity (60.5%), were less overweight or obese (22.4% vs. 34.2%, $P < 0.001$). They reported better knowledge of BP (72.4% vs. 68.3%, $P < 0.001$), blood cholesterol (31.1% vs. 26.4%, $P < 0.001$) and glucose levels (32.7% vs. 27.8%, $P < 0.001$). Self-perceived cardiovascular risk was rated low by 1,279 (20.4%), moderate by 3,710 (63.3%) and high by 893 (16.3%) women. Among 3,386 women tested using the Framingham score, 40.8% were at low, 25.2% at moderate and 33.8% at high risk.

Conclusions: Knowledge of CVRFs and self-perception of individual risk are inaccurate in women. Educational interventions should be emphasized.

Key Indexing Terms: Cardiovascular risk; Cardiovascular risk factors; Women; Lifestyle; Cardiovascular prevention. [Am J Med Sci 2017;354(3):240–245.]

INTRODUCTION

Although dramatic declines in heart disease mortality have been observed over the 2 past decades, cardiovascular disease remains the leading cause of death in women.[1,2] Recent data suggest stagnation in incidence and mortality of coronary heart disease, specifically among younger women aged less than 55.[3] Although a decline in incidence and mortality of ST-elevation myocardial infarction has been observed over 15 years in the French FAST-MI Registry, the proportion of young patients has increased, particularly women younger than 60 years (from 11.8% to 25.5%), among whom prevalence of current smoking (37.3% to 73.1%) and obesity (17.6% to 27.1%) increased substantially.[4]

Despite these changes, women are less likely to receive diagnostic evaluation for coronary heart disease, preventive treatment and guidance for lifestyle changes compared to men with similar cardiovascular risks.[5] Previous epidemiologic studies reported that cardiovascular risk is under-recognized in primary care patients as well as in healthy subjects, with women severely disproportionately affected.[6] In fact, women have been reported to underestimate the role of cardiovascular diseases as causes of mortality.[7] As awareness of cardiovascular risk factors (CVRFs) represents a major component for the implementation of preventive measures and healthy lifestyle choices, the related gap between self-perceived and actual cardiovascular risk may affect lifetime prognosis. Conversely, patients who accurately understand their risk report higher health-related preventative behavior rates such as diet and lifestyle modification or smoking cessation.[8-11]

This study is intended to assess knowledge of CVRF levels and self-perception of individual cardiovascular risk in a cohort of young to middle-aged women.

METHODS

Participants of the online survey were recruited through BFM TV, BFM radio and RMC radio channels. These channels have a wide audience and their broadcasts reach more than 10 million people daily. BFM TV and radio are specifically devoted to business, funding, marketing and economical issues, whereas RMC radio focuses on general news and sport competitive meetings. Recruitment of participants was completed within 3 weeks in April 2015. Women tuning in to the channels were asked to participate in an epidemiologic survey by completing an anonymous questionnaire online to collect information on lifestyle, health behavior and CVRFs. The survey was exclusively devoted to women. The study was approved for ethics by the AJILA institutional board. Participants completed the questionnaire on an anonymous basis. Individual identity, name, mail and address of participants were not collected. Participants were informed of the anonymous basis of data collection before they agreed to complete the questionnaire.

Participants had to answer a panel of 88 questions on CVRFs, their personal levels and their management. They were also asked to estimate their individual risk for a subsequent cardiovascular event.

Sociodemographic and educational levels were recorded along with data on age, weight, body mass index (BMI), waist circumference, hormonal status (previous pregnancies, contraception, menopause and hormonal substitutive therapy), individual and familial previous cardiovascular diseases, CVRFs, smoking, hypertension, diabetes and hyperlipidemia. Time spent on physical and sportive activities were assessed through questions on average total time per day and per week spent on various activities over the previous years. Participants also completed a semiquantitative questionnaire on food frequency, diet habits and depressive and anxious disorders.

Self-reported knowledge of CVRF levels was assessed in the entire study population and stratified by age, weight, contraceptive use, menopausal status, smoking, diet, exercise and sport activities. Women were asked to evaluate their own individual self-perceived cardiovascular risk as low, moderate or high. We then compared their risk level evaluation to the actual cardiovascular risk using the 10-year Framingham risk score, and we considered low risk to be $<2\%$ events, moderate risk to be 2-5% events and high risk to be $>5\%$ events.[12]

Statistical Analysis

Descriptive statistics included proportions for categorical variables, which were compared using χ^2 or Fisher exact tests as appropriate. No assumptions were made for missing data. Statistical analyses were performed with R3.2.3 (http://www.R-project.org). All P were 2-sided, with $P < 0.05$ considered statistically significant.

RESULTS

Characteristics of the Population

Within 3 weeks, a total of 7,152 subjects agreed to participate in the study and responded to the questionnaire, of whom 6,874 (95.5%) were women. Self-reported data were completed by 5,240 women (76.3%) and suitable for analysis.

Included women were young (Figure), with a high educational level: 62.1% were graduated at any University level, 21.2% had obtained a professional bachelor, 10.2% completed successfully and 6.5% failed to complete a high-school course. Most of them, 3,831 (73.1%), were engaged in a type of marital arrangement and 3,417 of them had at least 1 child (65.2%). Among the 3,011 participants under 45 years of age, 2,088 (69.3%) used a contraceptive, including the use of any oral estrogen-progestogen combined or lone progestogen contraceptive pill in 1,218 (58.3%) participants. Conversely, 1,035 of them (33.1%) did not use any contraception. In addition, 1,451 women (27.6%) reported a menopausal status.

Leisure-time physical activity of more than 30 minutes daily, any club-based exercise program or sport activity was performed by 3,150 women (60.5%). Diet concerns were reported by 2,959 (60.1%) women. A single or several previous nutrition preventive interventions with a weight-loss of at least 4 kg were reported by 1,046 (21.3%) and 1,157 (23.5%), respectively. In addition, 4,665 women (94.9%) reported that changes in their diet habits would be suitable to improve their subsequent cardiovascular risk.

Knowledge of CVRF Levels

CVRFs of the population are listed in Table 1. High waist circumference measurements were reported in 1,218 participants (33.3%), obesity in 739 (14.1%), current smoking in 1,272 (24.7%), diabetes in 70 (1.4%) and 562 participants (11.7%) were treated for hypertension.

Knowledge of personal CVRF levels increased with age, ranging from 51-90% for blood pressure (BP) level, 22-45% for blood glucose level and 15-47% for total blood cholesterol level, between 30 and 65 years, respectively (Table 2). Overall, less than half of women had an accurate knowledge of their individual levels of these 3 leading risk factors. In women with high

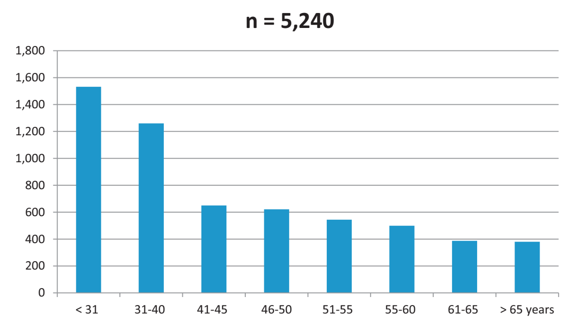

FIGURE. Study population by age subgroup.

TABLE 1. Cardiovascular risk factors and combined patterns in participants.

	Smoking (%)	Oral contraceptive use (%)	Treatment for HBP (%)	Waist circumference > 88 (%)	BMI ≥ 30 (%)
Smoking	24.7	10.5	1.8	5.9	2.5
EP oral contraceptive use		38.8	1	8.0	3.2
Treatment for HBP			11.7	8.0	3.7
Waist circumference > 88 cm				33.3	14.6
BMI ≥ 30					14.1

BMI, body mass index; EP, estrogen-progestogen; HBP, high blood pressure.

waist circumference measurements or BMI > 30 kg/m², knowledge of BP, blood glucose and cholesterol levels were 73%, 34% and 33%, respectively (Table 3). This knowledge was lower in smokers compared with nonsmoking women: 62.5% vs. 74.5% for BP ($P < 0.001$), 22.7% vs. 33.8% for blood glucose ($P < 0.001$), 21.9% vs. 32.0% for blood cholesterol levels ($P < 0.001$), respectively (Table 4). Also, knowledge of personal BP level was reduced among women using an estrogen-progestogen combined contraception: 56.8% vs. 62.1%, $P = 0.0031$ (Table 4). Among smokers using any estrogen-progestogen combination for contraceptive purpose, this knowledge was even more reduced: 52.2% vs. 63.6% for BP ($P < 0.001$), but not statistically significant for blood glucose (20.9% vs. 25.1%, $P = 0.11$), and for cholesterol (18.5% vs. 19.7%, $P = 0.65$) levels, respectively.

Self-reported knowledge of blood cholesterol and glucose levels was affected by the menopausal status. Among women after the menopausal transition, knowledge of blood cholesterol and glucose levels was higher than in nonmenopaused women: 44.9% vs. 33.8% ($P < 0.001$) and 40.9% vs. 32.5% ($P < 0.001$), respectively (Table 5). This difference was not observed for knowledge of BP levels.

Physically active women, those engaged in any leisure-time physical activity or in a competitive sport, were less likely to be overweight or obese (22.4% vs. 34.2%, $P < 0.001$). They reported more knowledge of all CVRF levels, including BP (72.4% vs. 68.3%, $P < 0.001$), blood cholesterol (31.1% vs. 26.4%, $P < 0.001$) and blood glucose levels (32.7% vs. 27.8%, $P < 0.001$) (Table 6).

Self-Perception of Individual Risk

Among participants, car accidents (noted by 1,204 women [23%]), breast cancer (noted by 1,131 participants [21.6%]), stroke (noted by 1,094 participants [20.9%]), myocardial infarction (noted by 669 participants [11.6%]), colorectal cancer (noted by 336 participants [6.4%]), bronchopulmonary cancer (noted by 474 [9.0%]), uterus cancer (noted by 226 participants [4.3%]), pulmonary embolism (noted by 149 participants [2.8%]) and AIDS (noted by 13 participants [0.2%]) were perceived as the main risk of death.

When women were asked to evaluate their own risk, self-perception statistics showed that 1,279 (20.4%) participants rated low, 3,710 (63.3%) rated moderate and 893 (16.3%) rated themselves high. Applying the Framingham risk score to 3,386 women with suitable files, 40.8% of them were classified at low risk, 25.2% at moderate risk and 33.8% at high risk. Thus, self-perception of individual risk among women with both low and high risk is inaccurate when compared with the Framingham risk scale. Importantly, about half of the women with high Framingham scores underestimate their cardiovascular risk (Table 7).

TABLE 2. Knowledge of individual cardiovascular risk factors among women ranging in age.

Age (years)	<31	31-40	41-45	46-50	51-55	55-60	61-65	≥65
Blood pressure, *n* (%)	672 (51.3)	778 (65.1)	434 (71.4)	447 (78.4)	388 (77.1)	378 (80.8)	287 (90.4)	255 (76.1)
Waist circumference, *n* (%)	769 (58.7)	805 (67.3)	442 (72.7)	449 (78.8)	394 (78.3)	374 (79.9)	280 (78.4)	268 (80)
Blood cholesterol level, *n* (%)	197 (15.0)	241 (20.2)	153 (25.2)	179 (31.4)	191 (38.0)	185 (39.6)	168 (47.1)	166 (49.6)
Blood glucose level, *n* (%)	284 (21.7)	304 (25.4)	160 (26)	171 (30.0)	176 (35.0)	189 (40.4)	160 (44.8)	142 (42.4)
BMI > 30 (%)	93 (7.1)	171 (14.3)	101 (16.6)	94 (16.5)	108 (21.6)	86 (18.4)	64 (17.9)	47 (14.0)
Waist > 88 cm (%)	126 (16.4)	259 (32.2)	157 (35.5)	172 (38.3)	142 (36.0)	171 (45.7)	121 (43.2)	119 (44.4)

BMI, body mass index.

TABLE 3. Knowledge of individual cardiovascular risk factors among women that were and were not overweight.

Knowledge of individual	Waist ≤ 88 cm, *n* = 2,560	Waist > 88 cm, *n* = 1,276	*P*	BMI ≤ 30, *n* = 4,702	BMI > 30, *n* = 771	*P*	Waist > 88 cm and BMI < 30, *n* = 3,990	Waist > 88 cm or BMI > 30, *n* = 1,488	*P*
Blood pressure, *n* (%)	1,666 (65.1)	949 (74.4)	<0.001	3,110 (66.1)	574 (74.5)	<0.001	2,592 (65.0)	1,093 (73.5)	<0.001
Blood cholesterol level, *n* (%)	680 (26.6)	440 (35.5)	<0.001	1,274 (27.1)	243 (31.5)	0.012	1,026 (25.7)	491 (33)	<0.001
Blood glucose level, *n* (%)	721 (28.2)	452 (35.4)	<0.001	1,318 (28.0)	283 (36.7)	<0.001	1,091 (27.3)	510 (34.3)	<0.001

BMI, body mass index.

DISCUSSION

In this study, a large sample of young to middle-aged women completed an 88-item standardized questionnaire on their knowledge, awareness and self-perception of individual CVRFs. Women included in the study had a high educational level, with half of them being bachelor or master's degree graduates in France. As reported in other studies,[13] their knowledge of CVRFs increased with age between 30 and 65 years. Overall, less than half of women in the study had an accurate knowledge of the 3 leading risk factors levels, i.e., BP, blood glucose and cholesterol levels. Moreover, even among overweight or obese participants, knowledge of BP, blood glucose and cholesterol levels were largely suboptimal (73%, 34% and 33%, respectively). Among smoking women, who represented about one fourth of the study population, knowledge of these 3 CVRF levels was lower than among nonsmoking women. Also, knowledge of individual BP level was reduced in women using an estrogen-progestogen combined contraception. In smoking women using any estrogen-progestogen combination for contraceptive purpose, this knowledge was as low or even reduced. Conversely, better knowledge of CVRF levels was observed among women after the menopausal transition, especially when given any substitutive hormonal therapy. This is encouraging since premature menopause and primary ovarian insufficiency, which occur in roughly 1% of women less than 40 years of age, are associated with an increased risk of cardiovascular disease.[14]

In contrast to the reduced knowledge of individual CVRFs, smoking females' self-perception of cardiovascular risk was increased. More than one third of them considered their individual risk as high or very high. Self-perceived cardiovascular risk was also increased among overweight women (either waist circumference >88 cm or BMI > 30). Conversely, women engaged in any leisure-time physical activity or sport, and women with preventive diet modifications were more prone to consider their risk lower than those who were not. Indeed, this observation is confirmed by previous studies, which reported a 30% lower risk of coronary artery disease in women practicing recreational physical activity. A recent study by Chomistek et al[15] indicated that physical activity is associated with a lower risk of coronary artery disease, even in young women who may differ from middle-aged and older women regarding lifestyle and CVRFs.

Self-perception of individual risk was misestimated in the whole study population, especially among women with increased risk. Among the 1,147 women with a high risk of cardiovascular events according to the Framingham score, 872 (76%) considered themselves at low or moderate risk. Previous studies reported similar, though less marked, findings. The Berlin female risk evaluation (BEFRI) study matched subjective perception of cardiovascular risk of 1,066 women aged 25-74 years with their actual risk estimate according to the Framingham score and showed that 41% of women correctly estimated their cardiovascular risk, whereas 49%

TABLE 4. Knowledge of individual cardiovascular risk factors among women regarding smoking habits and estrogen-progestogen contraceptive pill use.

	Smoking		*P*	EP contraceptive use		*P*	Smoking + EP contraceptive use		*P*
Knowledge of individual	−(*n* = 3,877)	+(*n* = 1,272)		−(*n* = 1,968)	+(*n* = 1,247)		−(*n* = 2,769)	+(*n* = 326)	
Blood pressure, *n* (%)	2,899 (74.5)	796 (62.5)	<0.001	1,222 (62.1)	708 (56.8)	0.0031	1,760 (63.6)	170 (52.2)	<0.001
Blood cholesterol level, *n* (%)	1,239 (32.0)	2,785 (21.9)	<0.001	360 (18.3)	244 (19.6)	0.39	544 (19.7)	60 (18.4)	0.65
Blood glucose level, *n* (%)	1,312 (33.8)	289 (22.7)	<0.001	462 (23.5)	301 (24.1)	0.70	695 (25.1)	68 (20.9)	0.11
Waist > 88 cm or BMI > 30	1,130 (29.2)	261 (20.5)	<0.001	468 (23.8)	197 (15.8)	<0.001	591 (21.3)	44 (13.5)	0.001

BMI, body mass index. EP, estrogen-progestogen.

TABLE 5. Knowledge of individual cardiovascular risk factors among women regarding menopausal status and hormonal substitution therapy.

	Menopause		*P*	Substitutive hormonal therapy		*P*	Smoking + substitutive hormonal therapy		*P*
Knowledge of individual	−(*n* = 566)	+(*n* = 1538)		−(*n* = 2,001)	+(*n* = 206)		+(*n* = 2,020)	−(*n* = 35)	
Blood pressure, *n* (%)	444 (78.5)	1,229 (79.9)	0.50	1,595 (79.7)	160 (77.7)	0.55	1,731 (85.7)	24 (68.5)	<0.001
Blood cholesterol level, *n* (%)	191 (33.8)	691 (44.9)	<0.001	821 (41)	92 (44.7)	0.35	898 (44.5)	15 (42.9)	0.98
Blood glucose, *n* (%)	184 (32.5)	629 (40.9)	<0.001	757 (37.8)	81 (39.3)	0.73	825 (40.8)	13 (37.1)	0.79
Waist > 88 or BMI > 30	192 (33.9)	575 (37.4)	0.16	753 (37.6)	55 (26.7)	0.002	746 (36.9)	10 (28.6)	0.41

BMI, body mass index.

underestimated it.[13] Among the 2,998 participants of the Dallas Heart Study, the misperception of lifetime cardiovascular risk for CVD was also common and frequently influenced by factors other than traditional CVRFs.[16] The Canadian Heart Health Surveys database examined knowledge and awareness of CVRFs in older Canadians. When reviewing this data, smoking and stress were mentioned as the major causes of heart disease by the greatest proportion of participants (41%), other CVRFs were underestimated, with hypertension mentioned by 16%, high blood cholesterol level by 23% and being overweight in 30%.[8] Other studies showed the gap between self-perceived health and awareness of CVRFs. Although self-perceived poor health was related to higher actual cardiovascular risk among 4,535 participants in the study by Ko and Boo,[17] there was no relationship with knowledge or awareness of individual CVRFs. A similar gap between self-rated health and CVRF knowledge was reported in a longitudinal population cohort in Norfolk, which included 20,941 middle-aged men and women. Baseline self-rated health predicted fatal and nonfatal cardiovascular events independently of sociodemographic, clinical and behavioral risk factors as well as participant characteristics.[18] However, such sociodemographic, clinical, behavioral, and a few additional, nonstandard factors such as some degree of benevolent sexism in management of health care issues in women, affect gender differences in cardiovascular disease.[19]

In most studies, knowledge of cardiovascular disease as the primary cause of mortality in women remains underscored, with only 54% of American women aware in a recent report.[7] Concomitantly, less than a half of young and middle-aged women in the German BEFRI study[13] and only a third in this study correctly estimate their cardiovascular risk. This study deserves further attention because of the high educational level of the participants and the even reduced awareness of the subgroups at higher risks such as currently smoking women (a fourth of the sample), women receiving a contraceptive estrogen-progestogen combination or both. Faced with the recently reported increase in cardiovascular events among younger women that smoke, these disappointing findings look rather alarming.[4]

This study was limited because the self-assessment of cardiovascular risk and the information on lifestyle, health behaviors and CVRFs were collected using an online questionnaire; the proportion of missing data may have modified the results substantially. However, only complete files were taken into account for subsequent analysis. Missing data may also have affected the Framingham risk score calculation as elevated BP, blood cholesterol and glucose levels may have been more likely to be reported than those ranging within normal values. However, women with the higher risk score included in the study were those who had the lowest knowledge of these CVRF levels.

A second limitation pertains to the selection of participants since women were drawn to the study from socially-elitist media channels. This resulted in the large proportion of women with a high educational level who were included. However, even in this population in which some health consciousness could likely be expected, awareness of CVRFs as well as self-perception of individual risk remained rather suboptimal.

TABLE 6. Knowledge of individual cardiovascular risk factors among women regarding recreational exercise or sport practice.

	Recreational exercise or sport practice		*P*
Knowledge of individual	−(*n* = 2,056)	+(*n* = 3,150)	
Blood pressure, *n* (%)	1,405 (68.3)	2,290 (72.4)	0.002
Blood cholesterol level, *n* (%)	543 (26.4)	974 (31.1)	<0.001
Blood glucose level, *n* (%)	572 (27.8)	1,029 (32.7)	<0.001
Waist > 88 cm or BMI > 30	704 (34.2)	704 (22.4)	<0.001

BMI, body mass index.

TABLE 7. Self-perceived cardiovascular risk compared with actual cardiovascular risk using the Framingham risk score.

	Framingham score <2%	Framingham score: 2%-5%	Framingham score >5%	All, *n*
Self-perceived risk low, *n*	365	198	127	690 (20.4%)
Self-perceived risk moderate, *n*	869	530	745	2,144 (63.3%)
Self-perceived risk high, *n*	149	128	275	552 (16.3%)
All, *n*	1,383 (40.8%)	856 (25.2%)	1,147 (33.8%)	3,386

CONCLUSION

Knowledge of CVRFs and self-perception of individual risk are highly inaccurate in the population of young and middle-aged women with a high educational level tested. Less than a half of them correctly estimated their cardiovascular risk. About one half of women with a low cardiovascular risk overestimated it and, conversely, one half of those at high risk underestimated it, an occurrence which may substantially affect subsequent outcomes. These results highlight the importance of effectively communicating the significance of risk factors in determining the lifetime risk for cardiovascular disease. They also emphasize the critical importance of reliable counseling and education campaigns about CVRFs to allow timely implementation of preventive measures in women. Such a public health policy may be of value since the female gender remains an independent predictor of worse outcomes after interventional or surgical cardiac procedures even after adjustment for CVRFs and use of propensity-matching.[20]

ACKNOWLEDGMENTS

The authors thank Jianing Jenny GU for her careful revision of the manuscript and her English editing.

REFERENCES

1. **Mozaffarian D, Benjamin EJ, Go AS, et al.** American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics 2015 update. Circulation 2015;131:e29–322.
2. **Garcia M, Mulvagh SL, Merz CN, et al.** Cardiovascular disease in women. Circ Res 2016;118:1273–93.
3. **Wilmot KA, O'Flaherty M, Capewell S, et al.** Coronary heart mortality declines in the United States from 1979 through 2011: evidence for stagnation in young adults, especially women. Circulation 2015;132:997–1002.
4. **Puymirat E, Simon T, Steg PG, et al.** Association of changes in clinical characteristics and management with improvement in survival among patients with ST-elevation myocardial infarction. J Am Med Assoc 2012;308:998–1006.
5. **Mosca L, Linfante AH, Benjamin EJ, et al.** National study of physician awareness and adherence to cardiovascular disease prevention guidelines. Circulation 2005;111:499–510.
6. **Turnbull F, Arima H, Heeley E, et al.** Gender disparities in the assessment and management of cardiovascular risk in primary care: the AusHEART study. Eur J Cardiovasc Prev Rehabil 2011;18:498–503.
7. **Mosca L, Mochari-Greenberger H, Dolor RJ, et al.** Twelve-years follow-up of American women's awareness of cardiovascular disease risk and barriers to heart health. Circ Cardiovasc Qual Outcomes 2010;3:120–7.
8. **Kirkland SA, MacLean DR, Langille DB, et al.** Knowledge and awareness of risk factors for cardiovascular disease among Canadians 55 to 74 years of age: results from the Canadian Heart Health Surveys, 1986-1992. CMAJ 1999;161:S10–6.
9. **Piotrowicz K, Palkowska E, Bartnikowska E, et al.** Self-reported health related behaviors and dietary habits in patients with metabolic syndrome. Cardiol J 2015;22:413–20.
10. **Thakkar J, Heeley EL, Chalmers J, et al.** Inaccurate risk perceptions contribute to treatment gaps in secondary prevention of cardiovascular diseases. Intern Med J 2016;46:339–46.
11. **Leifheit-Limson EC, D'Onofrio G, Daneshvar M, et al.** Sex differences in cardiac risk factors, perceived risk, and health care providers discussion of risk and risk modification among young patients with acute myocardial infarction: the VIRGO study. J Am Coll Cardiol 2015;66:1949–57.
12. **Wilson PF, D'Agostino RB, Levy D, et al.** Prediction of coronary heart disease using risk factor categories. Circulation 1998;97:1837–47.
13. **Oertelt-Prigione S, Seeland U, Kendel F, et al.** Cardiovascular risk factor distribution and subjective risk estimation in urban women- the BEFRI study. BMC Med 2015;13:52. http://dx.doi.org/10.1186/s12916-015-0304-9.
14. **Piepoli MF, Hoes AW, Agewall S, et al.** 2016 European guidelines on cardiovascular disease prevention in clinical practice. The sixth joint task force of the European Society of cardiology and other societies on cardiovascular disease prevention in clinical practice. Eur Heart J 2016;37:2315–81.
15. **Chomistek A, Henschell B, Eliassen AH, et al.** Frequency, type, and volume of leisure-time physical activity and risk of coronary heart disease in young women. Circulation 2016;134:290–9.
16. **Petr EJ, Ayers CR, Pandey A, et al.** Perceived lifetime risk for cardiovascular disease (from the Dallas Heart Study). Am J Cardiol 2014;114:53–8.
17. **Ko Y, Boo S.** Self-perceived health versus actual cardiovascular disease risks. Jpn J Nurs Sci 2016;13:65–74.
18. **Van der Linde RM, Mavaddar N, Luben R, et al.** Self-rated health and cardiovascular disease incidence: results from a longitudinal population-based cohort in Norfolk. PLoS One 2013;8:e65290.
19. **Molix L.** Sex-differences in cardiovascular health: does sexism influence women's health? Am J Med Sci 2014;348:153–5.
20. **Shah T, Palaskas N, Ahmed A.** An update on gender disparities in coronary heart disease care. Curr Atheroscler Rep 2016;18:28. http://dx.doi.org/10.1007/s1883-016-0574-5.

From the APHP Hôpital R Muret (JJM), Hôpitaux Universitaires de Paris Seine-Saint-Denis, Paris, France; Interdepartmental Division of Critical Care Medicine (TP), University of Toronto, Toronto, Ontario, Canada; Cardiologie (NK, LA) and Département de Chirurgie Cardio-Vasculaire (PM), APHP, Hôpital Européen Georges-Pompidou, Paris, France; Endocrinologie-Nutrition (CCA), Avenue du Président Wilson, Paris, France; Centre Médico-Chirurgical Marie-Lannelongue (MD), Le Plessis-Robinson, Paris, France; and AJILA (PD, IW), 12 Rue d'Oradour sur Glane, 75015 Paris, France.

Submitted January 18, 2017; accepted May 19, 2017.

Source of funding and promoter of the study: AJILA, 12 Rue d'Oradour sur Glane, 75015 Paris.

The authors have no conflicts of interest to disclose.

Correspondence: Jean-Jacques Monsuez, MD, PhD, Cardiology, Hôpital René Muret, Hôpitaux Universitaires de Paris Seine-Saint-Denis, Avenue du docteur Schaeffner, F-93270 Sevran, Paris, France (E-mail: jean-jacques.monsuez@aphp.fr).