Letter to the Editor

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# Life's Essential 8 and MAFLD in the United States

*To the Editor:*

The American Heart Association (AHA) recently proposed Life's Essential 8 (LE8) as an update of Life's Simple 7 (LS7) to quantify cardiovascular health (CVH), which included five health behaviors (nicotine exposure, physical activity, diet, body mass index, and sleep health) and three health factors (blood lipids, blood pressure, and blood glucose).[1] By adding a new sleep metric and being redefined on a more continuous scale, LE8 better reflects recent clinical guidelines, interindividual difference and intraindividual change than LS7.[1] Previous studies have reported associations between LS7 and cardiometabolic disease (*e.g.*, cardiovascular disease [CVD] and diabetes).[2,3] Metabolic dysfunction-associated fatty liver disease (MAFLD) is a newly proposed nomenclature that has been reported to be associated with increased all-cause and cardiovascular mortality, and those with advanced fibrosis have higher risk of all-cause mortality compared to those without.[4] Since MAFLD shared similar lifestyle and metabolic risk factors with CVD, we aimed to investigate the associations of LE8 with MAFLD and clinically significant fibrosis (CSF) in participants with MAFLD.

We analyzed adults from the National Health and Nutrition Examination Survey (NHANES) 2017-2018. Individuals who were pregnant, under 20 years old, had ineligible elastography examination status, or had missing data on MAFLD or components of LE8 were excluded, leaving 1,812 individuals for the final analysis. Based on expert consensus and published NHANES research, MAFLD was determined by controlled attenuation parameter ≥285 dB/m with ≥1 of the following: i) overweight or obese (body mass index ≥25 kg/m$^2$), ii) diabetes mellitus, and iii) at least 2 metabolic risk abnormalities. Metabolic risk abnormalities consisted of i) waist circumference ≥102 cm for men and ≥88 cm for women, ii) blood pressure ≥130/85 mmHg or specific drug treatment, iii) fasting plasma triglycerides ≥1.70 mmol/L or specific drug treatment, iv) plasma high-density lipoprotein-cholesterol <1.0 mmol/L for men and <1.3 mmol/L for women or specific drug treatment, v) prediabetes (fasting glucose 5.6-6.9 mmol/L or hemoglobin A1c 39-47 mmol/mol), vi) homeostasis model assessment of insulin resistance score ≥2.5, and vii) plasma high-sensitivity C-reactive protein level >2 mg/L[5,6]. CSF was determined by liver stiffness measurement ≥6.5 kPa.[5] Each CVH metric was assessed by the standard scoring algorithm, and the unweighted average of all components were further categorized into low CVH (0-49 points), moderate CVH (50-79 points), and high CVH (80-100 points) as recommended by AHA.[1] Weighted generalized linear models were performed to investigate the associations between LE8 and MAFLD.

A total of 661 out of 1,812 participants were diagnosed with MAFLD, of whom 225 were diagnosed with CSF. Compared to those with low CVH, participants with moderate and high CVH had a lower risk of MAFLD, with adjusted odds ratios (ORs) of 0.35 (95% CI 0.19-0.63) and 0.04 (0.01-0.15), respectively (Table 1). In participants with MAFLD, the OR for CSF was 0.81 (0.32-2.07) and 0.15 (0.02-0.86) among those with moderate and high CVH compared with low CVH, respectively.

The current study extended the literature by quantifying the protective association between LE8 and prevalence of MAFLD. Previous cross-sectional studies reported that a more favorable CVH score was associated with a lower prevalence of NAFLD in the Multi-Ethnic Study of Atherosclerosis and the Framingham Heart Study, showing ~80% risk reduction comparing the optimal and the inadequate CVH categories.[7,8] Compared with LS7, the percent risk reduction of MAFLD was more extreme when updating the CVH assessment with LE8, achieving ~95% risk reduction comparing the high and low CVH categories. Despite the distinct diagnostic criteria of NAFLD and MAFLD, our analysis showed no evidence of differences in the magnitude of associations between LE8 and each diagnosis (data not shown).

Our results also suggested that achieving ideal CVH metrics could lead to substantial liver health benefits not only in the general population but also in individuals who already developed MAFLD. Individuals with MAFLD in the high CVH category had an 85% lower risk of CSF compared with those in the low CVH category. Therefore, health education emphasizing incremental interventions on behavioral and metabolic risk factors could be beneficial. In addition, our study provided evidence for the usage of LE8 as an achievable indicator for prevention of MAFLD and advanced fibrosis in patients with MAFLD.

To sum up, the current study showed strong protective associations of LE8 with MAFLD as well as CSF in individuals with MAFLD. Our study reinforces the relevance of the AHA's 2030 strategic goals beyond cardiovascular health and

**Table 1. Associations between Life's Essential 8 and MAFLD.**

| | Univariate model | Multivariate model |
|---|---|---|
| | OR (95% CI) | OR (95% CI) |
| MAFLD | | |
| Low CVH | Reference | Reference |
| Moderate CVH | 0.41 (0.25–0.67) | 0.35 (0.19–0.63) |
| High CVH | 0.05 (0.02–0.12) | 0.04 (0.01–0.15) |
| Linear LE8 | 0.94 (0.92–0.95) | 0.94 (0.92–0.95) |
| CSF in participants with MAFLD | | |
| Low CVH | Reference | Reference |
| Moderate CVH | 0.77 (0.32–1.84) | 0.81 (0.32–2.07) |
| High CVH | 0.13 (0.04–0.41) | 0.15 (0.02–0.86) |
| Linear LE8 | 0.97 (0.95–0.995) | 0.98 (0.95–1.003) |

Weighted generalized linear models were used in the analysis. Multivariate model was adjusted for age, sex, ethnicity, marital status, and education. CSF was defined as LSM ≥6.5 kPa.

CSF, clinically significant fibrosis; CVH, cardiovascular health; LE8, Life's Essential 8; LSM, liver stiffness measurement; MAFLD, metabolic dysfunction-associated fatty liver disease; OR, odds ratio.

supports the application of LE8 for MAFLD risk assessment and hepatic health promotion.[9]

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## Conflict of interest

The authors have declared no conflict of interest.
Please refer to the accompanying ICMJE disclosure forms for further details.

## Authors' contributions

Conceptualization, X.W. and Y.P.; methodology, X.W. and Y.P.; software, X.W., A.W., R.Z. and Y.P.; validation, X.W., A.W. and Y.P.; formal analysis, X.W., A.W., R. Z. and S.C.; investigation, Y.P.; resources, X.W.; data curation, X.W. and A.W.; writing—original draft preparation, X.W. and Y. P.; writing—review and editing, X.W., A.W., R.Z., S.C. and Y.P.; visualization, X.W.; supervision, Y.P.; project administration, Y.P.; funding acquisition, Y.P. All authors have read and agreed to the published version of the manuscript.

## Supplementary data

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