Research Article

Dietary Beliefs and Management of Older American Indians With Type 2 Diabetes

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ABSTRACT

Objectives: This qualitative study examined dietary-related beliefs and self-management among older American Indians with type 2 diabetes mellitus (T2DM).

Design: Semistructured in-person interviews were conducted and digitally recorded.

Setting: Southeastern American Indian tribal community.

Participants: A total of 28 noninstitutionalized older tribal members aged >60 years.

Phenomenon of Interest: Study participants' beliefs and experiences with dietary practices and management related to T2DM.

Analysis: Transcribed qualitative interviews were coded using an inductive content analysis approach.

Results: Four themes regarding T2DM dietary beliefs and T2DM dietary management emerged from the analyses: diet changes, portion control, health care professional and family influence, and barriers to healthy eating. Study participants described how their beliefs, practices, and experiences in these 4 areas related to T2DM.

Conclusions and Implications: American Indian older adults face a variety of challenges to dietary management of T2DM. Future research efforts can focus on assessing how social support can be leveraged to facilitate healthy diets for American Indians with T2DM. Clinicians and diabetes educators and Native communities have an instrumental role in identifying culturally appropriate messages and programs to help persons effectively manage T2DM.

Key Words: American Indians, dietary beliefs and management, type 2 diabetes mellitus (*J Nutr Educ Behav.* 2019; 51:826−833.)

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INTRODUCTION

Type 2 diabetes mellitus (T2DM) is a prominent example of existing health disparities for American Indians. Compared with all other racial and ethnic populations, American Indians have the highest prevalence of T2DM, over twice that of whites (15% vs 7%);[1] T2DM treatment accounts for over one third of all of Indian Health Services medical costs.[2] American Indians also experience 2–4 times higher T2DM-related health complications compared with those of their white counterparts,[3] and T2DM-related mortality rates are 1.6 times higher among American Indians of all ages compared with the general US population.[4]

One of the key components of T2DM self-management includes adoption of and adherence to a healthy balanced diet. Nutrition therapy recommendations for individuals with T2DM include limiting the amount of foods high in fat, sugar, and sodium and increasing intake of foods rich in nutrients, such as fruits and vegetables.[5] However, the adoption of healthier eating patterns is highly dependent on the knowledge, beliefs, and attitudes regarding the role of diet in T2DM self-management.[6]

It is important to seek an understanding of contextual factors that influence dietary beliefs and practices among persons with T2DM among different racial and ethnic populations. Few known studies examined dietary beliefs and management practices as they relate to T2DM among American Indian adults of all ages. One study surveyed 219 Lakota Indian adults residing on 2 adjacent reservations in South Dakota.[7] Of this sample, 86% agreed that T2DM was related to what people ate. Regarding specific desirable dietary practices, 90% indicated reducing the amount of food eaten, 86% indicated eating more fruits and vegetables, and 79% indicated reducing high-fat food consumption.[7] A

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second study with 203 urban American Indian women with unknown T2DM status revealed that 91% held beliefs that dietary practices were related to T2DM. Regarding specific dietary practices, 79% tried to eat more fruits and vegetables, 70% reduced the amount of food consumed, and 62% eliminated snack foods.[8] A third study with 20 American Indian male participants, 35% of whom had T2DM, implicated poor dietary practices as one of the primary ways to both prevent and manage T2DM.[9] Many participants also identified the higher cost of healthier foods and the inconvenience of maintaining a healthy diet as significant barriers to long-term healthier eating patterns. Based on the findings from these 3 studies, it appears that overall, American Indians appreciate the role of diet in T2DM prevention and self-management, which contributes to adopting healthier diets. Yet, notable barriers can also impede one's success in maintaining healthier eating patterns.

A recently published study[10] of older American Indians with T2DM examined their T2DM-related beliefs, attitudes, and practices including diet. With regard to dietary beliefs, participants expressed that food was a central feature of community social gatherings. To the authors' knowledge, no other publications examined dietary beliefs among older American Indians with T2DM. This is surprising because aging, race/ethnicity, and diet are main risk factors for T2DM and older adults have the highest percentage of T2DM: 25% of persons aged ≥65 years have T2DM.[11] Overall, research findings identified generational differences in food consumption and related beliefs. For instance, older Hispanic mothers were less acculturated and ate less fat and had higher vegetable, fruit, and fiber intake than did their daughters.[12] With a mixed race and ethnicity sample of adults at 8 community health centers, compared with younger adults, older ones were less likely to endorse behavioral factors such as diet and exercise as causes of body weight.[13] An examination of *American Indians Diabetes Prevention Demonstration Project* participants found that retired American Indians and Alaska Natives were more likely to select healthy foods more frequently compared with their non-retired counterparts.[14] Thus, inquiry focusing on older adults is important to identify and understand dietary beliefs and practices among American Indians. Improving understanding of this will become increasingly more relevant for practitioners because between 2012 and 2050, the number of American Indians aged ≥65 years is estimated to increase nearly fourfold from 266,000 to 996,000.[15] The prevalence of T2DM is substantially higher among those in the study's participating tribe: 60% of tribal members aged ≥65 years have T2DM.[16] Thus, the aim of this study was to examine dietary beliefs and dietary self-management practices qualitatively among older American Indians with T2DM.

Two theoretical frameworks helped to guide this study, including the social constructivist theory[17,18] and explanatory models of illness.[19] The social constructivist perspective explains that knowledge is generated and interpreted collectively through shared language and experiences, and thus individuals make sense and meaning from their experiences.[18] With this perspective, the investigative team considered participants' beliefs through the framework and context of the tribal community. The explanatory models of illness framework explain how cultural groups make sense of illnesses and have culturally distinct ways of responding to illnesses that are intimately related to shared beliefs, values, and behavioral norms.[19] This framework directed the investigative team to assess how participants understood their own illnesses and responded to them.

METHODS

Study Design

This study was guided by community engagement research principles;[20] the examination of T2DM was in response to its being the top health priority for the participating tribe. The researchers employed a low-inference qualitative descriptive methodology in which the aim was to use a pragmatic approach that was a straight description of an experience.[21] This methodology allowed the investigative team to understand individual and community perspectives regarding diet and T2DM. Examining American Indians' perspectives can improve the understanding of how they live with T2DM and how living in community spaces influences dietary practices.

Study Participants

The researchers invited participation in the study among those who participated in the Native Elder Care Study, which was conducted with the same tribe. The principal investigator (PI) of the Native Elder Care Study had >18 years of experience working with this tribe and its older members. The Native Elder Care Study was a cross-sectional study of 505 non-institutionalized adults aged ≥55 years who were members of a federally recognized American Indian tribe. Inclusion criteria included being a tribal member aged ≥55 years who was noninstitutionalized, cognitively intact, and resided in the tribe's service area. Greater detail about the Native Elder Care Study's methodology is described elsewhere.[20]

For the current study, a purposive sampling method was used. Study eligibility included being a participant in the Native Elder Care Study, residing in the tribe's service area, and having self-reported T2DM. Participation was solicited through mailed letters to members of the Native Elder Care Study cohort who were still alive and had indicated that they had T2DM. Death information for the Native Elder Care Study cohort was obtained from public state death records. The letter provided the study objectives and a local telephone number of the PI. As shown in the Figure, the first mailing was sent to 372 persons and a second mailing was sent 15 days later, removing those who had already responded and those whose first letter could not be delivered (n = 35). A total of 47 interested participants responded to the letters; 28 ultimately participated. Among the 19 who did not participate, 6 did not have T2DM. Ten did not show up to a scheduled interview, canceled a scheduled interview, or did not return calls. Two were married but declined participation because their interviews

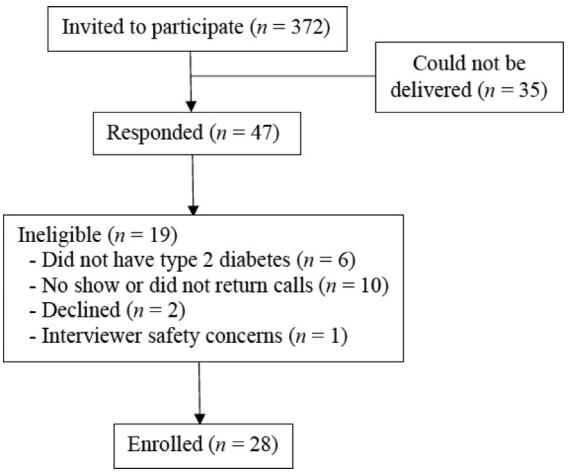

Figure. Study participant enrollment flowchart.

could not be conducted together. Finally, a scheduled interview was not conducted owing to the interviewer's safety concerns.

Data Collection

Data were collected with a semistructured qualitative interview guide, which was developed primarily with input from the community advisory board (CAB) members and the research literature. The study questions and design emerged from ongoing discussions with the project's CAB, which was assembled based on the PI's prior experience conducting research with the participating tribe. An interview guide was pilot-tested with a convenience sample of 6 tribal members (4 women and 2 men) who were aged ≥60 years and had self-reported T2DM. The study's PI conducted the pilot-tested interviews accompanied by a graduate student for their training purposes. The investigative team discussed the feedback obtained from the pilot-tested interviews and revised the interview guide accordingly. Specifically, the interview guide was modified by adding probes, reordering questions, rephrasing the question regarding emotional experiences, and adding 5 new questions. The final interview guide consisted of 19 main questions with probes (Table). The age and gender of participants were obtained through the Native Elder Care Study data; current marital status was obtained during the qualitative interview.

The study's PI and a graduate student conducted 28 interviews in fall, 2015. Each interview, which lasted 48 minutes on average, was conducted individually and face-to-face either in participants' homes or in a private office setting. All interviews were digitally audio-recorded and professionally transcribed. Transcriptions were audited for completeness

Table. Study Interview Qualitative Questions

How long have you had type 2 diabetes?
What do you think about having diabetes?
What is different between those who get diabetes and those who do not in the Eastern Band of Cherokee Indians?
What do you think caused your diabetes? Probes: How did it make you feel when you were first diagnosed? How does it make you feel now? Do you feel as though you were going to get it no matter what you did?
How confident do you feel that you can successfully manage your diabetes, on a scale from 1 to 10, with 1 representing no confidence and 10 representing the greatest confidence?
How do you manage your diabetes on a daily basis? Probes: What things do you do well? Can you share an example? What helps, and how? What things do you not do so well?
Overall, would you say that your diabetes is well-managed or poorly managed?
Can you share a time when you knew your diabetes was not as well managed as it could be?
What are the primary factors or reasons why you say your diabetes is well managed/poorly managed?
Among those who have diabetes in the tribe, what do those people with well-managed/poorly managed diabetes do differently from you?
Who helps you with your diabetes? Probes: Do you have strong social support with respect to your diabetes management?
What is the value in managing your diabetes well?
What are the consequences of not managing your diabetes well?
How do your feelings, such as feeling down, tired, or out of energy, affect your ability to manage your diabetes?
What is it that you wish others understood about your diabetes?
Is there anything you need that you do not already have to manage your diabetes better?
Other than what the doctor has told you and what you have learned from experience, is there a Cherokee way to deal with your diabetes?
In general, what are the factors that you believe contribute to good diabetes control?
Are there any other thoughts you have about your diabetes and your ability to manage it that you would like to share?

and accuracy by 2 of the study investigators. Written informed consent was obtained from all participants, who received $75 for participation. Approval for this study was obtained from the tribe's institutional review board (IRB), the tribe's health board, and the tribal council. The PI's academic home and the tribe signed an IRB authorization agreement, which permitted the academic institution to cede review to the tribal IRB.

Analyses

All analyses were informed by a qualitative analysis expert (J.J.). Using NVivo qualitative data management software (version 11, QSR International, Melbourne, Australia), qualitative thematic content analysis was performed primarily by 1 team member and corroborated by 2 other members through reflexive and iterative team consensus discussions. Thematic content analysis is a low-inference interpretive technique in which researchers derive valid and reliable contextual meaning in a systematic manner from qualitative data that originated from open-ended interviews.[22] The analytic team consisted of 3 investigators from the fields of nursing, gerontology, and public health and with experience in both qualitative and community-based participatory research. Specifically, thematic analysis was used to code *in vivo* text openly and inductively and to derive themes regarding participants' T2DM-related dietary beliefs and dietary management. As noted, the description, naming, and interpretation of themes was an iterative team process. This type of thematic work is interpretive in nature and grounded in team understanding rather than interrater reliability analysis.

Analyses were completed for the first 28 participants when coding suggested that informational saturation of content had been achieved. Specifically, saturation was determined when interviewees were no longer offering new ideas, no more patterns were emerging from the data, and further coding was ineffective.[23,24] Several strategies were used to ensure trustworthiness. The interview data were triangulated through comparison with debriefing discussions with CAB members to test potential transferability of contextual interpretations. A detailed audit trail was also maintained through audio recordings and note taking of decisions, discussions, theme development, and the refinement of analyses and procedures.[25]

RESULTS

For the 28 interviewees, their age was 73.0 ± 6.4 years (range, 61–89 years); slightly more than half (57%; n = 16) were women and half (n = 14) were married. Four themes with respect to T2DM-related dietary beliefs and self-management practices emerged from the analyses: diet changes, portion control, health care professional and family influence, and barriers to healthy eating.

Diet Changes

A diagnosis of T2DM was viewed by study participants as a significant cue to change their diets, which included the types of food they typically ate and the way these foods were prepared. A female participant referred to cutting back on cooking fried foods: "I don't fix a lot of greasy food anymore. I try to do a lot of baking the food, the chicken, the meat, grilling." Fatback, which is fat from the back of a pig, was commonly referred to among participants as a type of food on which to cut back. Another female participant stated: "I don't eat fatback anymore because I know it's a bad fat." As expressed by 2 male participants, cutting back on sugar and salt were also identified as important changes in individuals' diet:

> *She obviously cut back on the—when she bakes a cake, she cuts back. She don't put as much sweetening in it. She makes more of a diabetic cake when she does it because she herself don't like too much sweetness.*

> *I've cut down on salt. A lot of people just add the salt the first thing when they start eating. I just take it as it's given to me and I don't add no salt to it or nothing like that. I use the non-sugar fake diet drinks all of the time. I use the Splenda or sweeteners.*

Finally, a male participant described the change in diet since the T2DM diagnosis as the needs to eliminate foods high in carbohydrates and eat more salads and vegetables:

> *I remember getting more steamed vegetables and stuff that was boiled rather than grilled. I remember the emphasis was more on salads and vegetables, which I do still eat mostly salads, and not as much—or not any really—carbohydrates like baked potatoes, or mashed potatoes and gravy, which I had quite a bit of before. Bean bread and chestnut bread no longer.*

Portion Control

Portion control is eating a healthy balance of amounts and different types of varied food within a certain dietary pattern. It is also knowing how much a serving size of food or beverage is and how many calories a serving contains. Two female participants illustrated their rationale for food portioning:

> *I have learned through all these years that it's not really what you eat, but the amount that you put in that can't either process fast enough and builds up as sugar or what. But if you eat a little bit, all the processes just keep working normal.*

> *I watch what I eat and I check my blood sugars. I know as soon as I pick up something [that] I'm not supposed to have, I know that if I get too much of it, then I'm going to pay for it, so I try to cut it down to about a piece of cake. I'll cut it down. I say, cut me off just a sliver. I make it last. I eat it slow.*

Another 2 female participants discussed cutting back on sugary drinks and replacing them with water:

> *I don't buy as many drinks now, because that's a temptation if I have them in the fridge, and then end up screaming my name. So, I go and get cases of water, and my coffee. . . . I put it all on portion control, exercising, watching what you eat, eat more veggies and*

fruits, and a lot of greens, and lay off a lot of that meat.

That's what scares me, too, is I know I need to get myself in better condition and better shape so I don't have to go on dialysis, and I try not to drink a whole lot of sodas.

Health Care Professional and Family Influence

Participants offered ways in which they incorporated what they learned from health care professionals about dietary management of T2DM. A female participant said,

Now, fruits, we love fruit . . . but they told me at the diabetic clinic, 'Well, the fruit has sugar, too. You shouldn't be eating too many fruits.'

Several male participants stated that their spouses would act as a facilitator for better dietary management:

I call my wife a caretaker because in regard to what you should do, that's why I do everything I should do, and I monitor everything completely. It's because she does make sure I do all of those above.

My wife . . . If I didn't have her, I'd be dead. It's obvious. There again, every good relationship, you decide what you're best at. Definitely in this case, she's best at maintaining and taking care of my health maintenance.

Furthermore, male participants described how they regarded their wife as taking an active role in ensuring sure that they were eating healthy:

Now she makes sure that she monitors all of my food intake and that I have that cereal that tastes like lox in the morning, well, with fruit and nuts in it, too, and yogurt. Health food for breakfast, and then a salad for lunch, and then a good meal for supper. Everything is more than adequately tended to regarding my diet.

I could only eat stuff that my wife specifically knew met the criteria for diabetic meals. Of course, she monitors what I drink, too, so no more sweet tea, which I forgot to say a while ago. She cut off my sweet tea, except that she observed me putting those little pink things in.

However, not all family influences were viewed as positive. One female participant expressed how her son influenced her to choose less healthy food choices:

I watched what I eat. Because I'm here by myself during the day, or supposed to be, but my son was working away, and he's home now, and he's always saying, "Let's go eat here" and "What do you want to eat?" He thinks he's taking care of me by feeding me, and then I think, "Well, what the heck? If he's gonna pay for it, I'll eat it anyway."

Barriers to Healthy Eating

Participants often alluded to the challenges of diet changes and/or portion control for the long term, including not wanting to waste food, loss of motivation, cost, and community dinners. Two female participants shared common reasons, including not wanting to waste food or simply that it was tiring to keep a balanced diet:

When I do eat, like when I eat here, I don't like to waste food. And I guess that's another bad thing: we didn't waste food growing up. We ate what was put in front of us or starved. I have—like I said, I have to decide what it is I really want. They can tell you I'll go through the line and I'll say, don't, don't, don't. Because I don't want to waste food. So, I can only pick out 1 or 2 things that I really want and that's what I concentrate on. It's not always, like, a well-balanced diet.

I remember when I was trying to watch what I was eating, but then there would come times, and I guess a lot of people, you just didn't care. You got tired of trying to eat the right things and do what was right. And you got tired of that, and therefore you didn't care. You just let yourself go.

Affordability of healthier foods was also a barrier for some, as exemplified by 2 male participants:

What I meant is, financially we can't go. We can't afford to go to the grocery store every other day, buy all that [healthy] stuff. What we buy is that stuff in the can. It's got a lot of salt in it, and that's bad for diabetes, too, because when you buy special food along, let's say, triple, or a dollar, or a dollar and a quarter for peas, you can buy all that stuff, and you still contributing to your diabetes. Any way you look at it, we're in a jam in the financial world.

There again, honest to God factor that needs to be considered is, again, money. What's cheap? The cheapest things you can get are taters and gravy. Ironically, what's least? We can't afford soy or stuff like that. Why not go ahead and get what you can afford? That's something I think more attention needs to be provided to.

In the participating tribal community, members almost universally referred to Indian dinners as traditional. One female participant discussed commonly served foods in the community as being incompatible with effective dietary management of T2DM:

Well, usually, they have the Indian bean bread, and fatback, and fried chicken, fried potatoes, fried everything. And that's probably fried in grease instead of oil.

The paradox between the community-wide message to eat healthier and communities simultaneously promoting Indian dinners is illustrated in the following statement from a male participant:

Mixed messages—we send out messages with our mouth but we don't act out the messages with our body about trying to live healthy. Every time they have a so-called Indian dinner, it's fatback grease and bean bread and fried cabbage and fried potatoes in the fatback and all the things that our bodies used to tolerate but don't no longer. So, we have mixed messages . . .

Participants expressed awareness about the dangers of eating these foods:

They are always harping about eating the right things, and then they'll have all these Indian dinners served for benefits, and there's always the wrong type of food to eat.

Here, we call it traditional food, bean bread, lye dumpling, mustard greens, fried chicken, fried potatoes … all that stuff is good. It may be good, but it's dangerous.

DISCUSSION

The goal of this study was to better understand the dietary beliefs and dietary self-management of older American Indians with T2DM. This study adds to the limited research-generated understandings of the experiences of dietary management in this population. The analyses revealed 4 emergent themes: diet changes, portion control, health care professional and family influence, and barriers to healthy eating.

Study participants shared dietary practices that they used to manage T2DM. Diet changes included both replacing unhealthy with healthier food choices and cooking them in ways believed to be healthier. These findings reflected similar results from other studies with American Indians.[7,8] With regard to portion control, participants also discussed strategies for limiting the daily amount of food they ate, which was similar to portion control beliefs among the Lakota Indians.[7] Those dietary strategies coincided with nutrition therapy recommendations for people with T2DM.[5]

Study participants also expressed how information and positive support from health care professionals and family members were instrumental in their dietary self-management efforts. Indeed, the effect of family and other social supports on successful T2DM self-management was demonstrated in an earlier study in this tribal community[26] and other American Indian and Alaska Native communities.[27,28] Despite this support, perspectives shared by participants indicated that personal beliefs (eg, distaste for wasting food) and weariness of maintaining a healthy diet continued to thwart their ability to maintain a healthy diet.

In this study, barriers to adopting and maintaining a healthy diet included not wanting to waste food, loss of motivation, cost, and community dinners. Cost and motivation were also found to be significant barriers among American Indian men in Oklahoma.[9] The cost of healthy foods appears to reflect social and environmental circumstances in other American Indian and Alaska Native communities.[29] Food deserts, areas with few or no affordable healthy food choices, are associated with higher T2DM prevalence among American Indians.[30] American Indian adults who report food insecurity, the inability to access a sufficient quantity of affordable nutritious food, also reported experiencing more barriers to accessing healthy foods.[31] Growing concerns of these issues fueled the First Foods movement in many Native communities.[32] Some study participants viewed the promotion of Indian dinners at community events and fund-raisers as divergent from messages by diabetes educators about healthier eating habits. However, these Indian dinners are not traditional in the sense that they represent what has been called First Foods, or foods typically consumed in the community before colonialization.[33]

This study had limitations that need to be acknowledged. First, it is possible that the perspectives of those who chose not to participate in the study substantially differed from those who did participate. Second, only one-on-one interviews were conducted. It is possible that more perspectives might have been shared in focus groups that would not have emerged from individual interviews. Finally, although member checking is a useful strategy in qualitative research to verify the transferability of findings, it was not conducted in this study. To compensate for the lack of member checking, the investigative team verified study findings with the CAB.

IMPLICATIONS FOR RESEARCH AND PRACTICE

These findings point to several important directions for future research. The *Special Diabetes Program for Indians Diabetes Prevention* demonstrated that the *Diabetes Prevention Program* can be translated effectively into American Indian and Alaska Native communities.[34] Yet, given the diversity of infrastructure and resources across tribal communities, future studies are warranted to examine the program's ability to affect dietary management and sustainability positively in specific tribal communities. In a related manner, community-based participatory research approaches are essential for the successful adoption and implementation of these programs to Native communities in ways that are culturally appropriate. As such, it is recommended that subsequent studies take an asset approach. For instance, a deeper and more nuanced assessment of how the social support network can be better leveraged to facilitate American Indians adhering to a diet supporting healthy T2DM management may hold promise for augmenting existing community-based efforts or the development of new ones. Furthermore, an examination of persons with T2DM who maintained a healthy diet, to identify factors that supported their practices, would yield valuable program planning and development information. Finally, the *Special Diabetes Program for American Indians* found that older participants selected healthy foods more frequently than did younger participants. Further study is warranted to assess these age differences in food choices because it may generate ideas for interventional efforts that include a multigenerational element.

To improve dietary practices in American Indian communities, it is essential to understand the values, beliefs, and barriers that can have an impact on effective T2DM management.[35] Although findings from this study demonstrated that older American Indians understood the importance of incorporating healthier foods and cooking methods and monitoring the amount of caloric intake in managing T2DM, they faced several barriers such as cost and unhealthy foods made available to them. Yet, as this study showed, health care professionals and family members can have a powerful impact

on both adopting and adhering to healthy diets with this population. Clinicians and diabetes educators may want to consider the barriers to dietary adoption and adherence and determine the level of intervention needed to overcome those barriers, and thus prevent the onset of T2DM complications for their patients.[36] Another approach would be to implement changes in tribal community food environments.[37] For example, local food stores could be engaged to increase and promote healthier food options. Similarly, developing and maintaining community gardens could increase access to healthier fresh produce.[38] Given the continued higher prevalence of T2DM and negative health outcomes among American Indians,[1,3,4] more diet-based interventional approaches are needed at both the community (macro) level and individual (micro) levels.

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