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Complexity of Psychological and Behavioral Science in Diabetes: The 2025 Richard R. Rubin Award Lecture

Edwin B. Fisher

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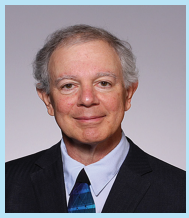
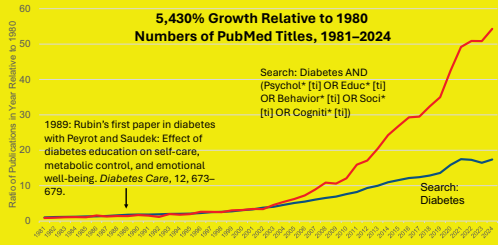


Richard R. Rubin, PhD
1943–2013
Psychologist
Professor, Johns Hopkins University

Key Foundations that Rubin Championed
- Is diabetes psychological? Indeed.
- Is it biological? Of course.
- Is it an awful disease that nobody should have to suffer? Yes, sadly it can be.
- Can people with diabetes live good lives? For sure!



Growth of the Field to Which Rubin Contributed
- Understanding how psychological problems have roots in the very real characteristics of diabetes
- Addressing the many contexts affecting living with diabetes—families, organizations, communities
- Major roles of social influence and social support
- Community and peer approaches to creating environments and cultures that support living well with diabetes
- To reach millions at risk for and living with diabetes, importance of ***intentional variety*** of program features—many good practices rather than one or a few best practices
- Flexibility in implementation with standardization guided by key functions of interventions to meet the needs of different groups in different settings

ADA AWARD LECTURE

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Complexity was a strong and persistent theme in Richard Rubin's work on psychology and behavior science in diabetes. That complexity began with his recognizing that, as challenging or horrible as diabetes may be, we can also manage to live good lives with it. With his many contributions along the way, this article will review the growth of our field to include *1*) recognition of the psychological problems and challenges of diabetes; *2*) developing ways both to raise up the very real challenges of diabetes and to promote leading good lives with it; *3*) understanding how psychological problems may have roots in those challenges in the course and complications of diabetes; *4*) addressing the many contexts affecting living with diabetes—families, organizations, communities; *5*) the major roles among those contexts of social influence and social support; *6*) community and peer approaches to creating environments and cultures that support management, enhance quality of life, reduce distress, and promote emotional well-being; *7*) the importance of intentional variety of program features—many good practices, not one or a few best practices—in order to reach the millions at risk for and living with diabetes; and *8*) to meet the needs of varied groups and settings, flexibility in implementation and evaluation with standardization according to key functions of interventions, not procedural details. In reflection, addressing the psychological and behavioral aspects of diabetes has provided opportunities for contributions amidst support and affection of colleagues.

Complexity was the theme of many of Richard Rubin's (1943–2013) contributions to recognizing, understanding, and addressing the psychological aspects of diabetes. Is diabetes psychological? Indeed. Is it biological? Of course. Is it an awful disease that nobody should have to suffer? Yes, sadly it can be. Can people with diabetes live good lives? For sure! Mark Peyrot (1949–2022), who also left us far too soon, remembered Dick's complexity as "a prolific researcher, a leader of diabetes organizations, a sought-after motivational speaker, an outstanding clinician and mentor to diabetes care professionals, a valued colleague/collaborator, a trusted advisor, and a beloved friend/brother/husband/father" (1).

Dick and I lived in some parallel, born in 1943 and 1946, PhDs in clinical psychology in 1971 and 1972, both first engaging with diabetes in the 1980s. A year and a half ago, another parallel emerged as I was diagnosed with cancer as he had been. My own experience intensified my appreciation of Dick's contributions in lifting the scales from our eyes about the experience of serious disease. One of Dick's great talents and gifts was his ability to articulate how difficult, challenging, wearying, and often simply awful diabetes is and, at the same time, how we can struggle, hope, sometimes make things better, and, most important, live. A wonderful cancer nurse practitioner channeled Dick as she reassured me, "Cancer is a %#@&!! We burn it, we poison it, we cut it, and still _____. But you are fortunate."

If the most important thing about diabetes is that it is for the rest of your life, Dick, Martha Funnell, David Marrero, and other colleagues have taught me what is second most important: it is, fundamentally, progressive. Even when people work extremely hard to manage their diabetes, devastating complications like vision loss can still occur. Dick understood this and still found a way to encourage living. In contrast, I would argue, are survey items like this: "Taking an active role in my own health care is the most important factor in determining my health and ability to function," taken from a popular measure in the field. Instead of *The Little Engine That Could*,

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"I think I can," I adopt Dick's message that, yes, diabetes, cancer, and lots of other things we encounter in life are a "%#@&!!" The response, though, has to be, must be, to live, L'Chaim.

The balance of this article will recount Dick Rubin's initial, seminal contributions to understanding the roles of psychology and behavioral science in diabetes and then discuss important evolution of the field to which he and so many have contributed. Important features include how we think about mental health in diabetes, the roles of families, and then other social and organizational contexts. The article goes on to consider the importance of social support and work such as peer support to provide it, including the role of peer support in emotional well-being and, returning to contexts, the roles of communities and their cultures as settings of peer support. The final sections address how complex contextual, social, and psychological issues require flexible and adaptable interventions and the challenges associated with their evaluation. The article concludes with a reflection on the issues raised herein and then a more personal reflection on my own work and some thoughts on career priorities and values.

Progress for Sure

The first article in which Dick wrote on diabetes appears to have been in *Diabetes Care* in 1989. With Mark Peyrot and Christopher Saudek, he foreshadowed integrating the behavioral, biological, and psychological under the title "Effect of Diabetes Education on Self-care, Metabolic Control, and Emotional Well-being" (2). As is clear in Fig. 1, a remarkable, 5,430% growth of publications in the field has followed, representing both the industry of those of us examining the behavioral aspects of diabetes and broader recognition of their importance. But another view of the data is sobering. In 2024, papers on psychological/educational/behavioral aspects of diabetes still account for only 3.48% of all in the field.

Empowerment, Wisdom, and Sensitivity to the Situation

A little experimental psychology provides what may be a useful perspective on the empowerment and similar concepts Dick and many of us have promoted. "Schedule effects" are ways that responding reflects the frequency and timing of reinforcers. For example, in a schedule in which reinforcement follows the first response after, say, 30 s have passed, responding slows down and then speeds up over the course of the 30 s until the next reinforcer becomes available. Schedule effects are widely documented with rats and pigeons but not consistently observed with humans. Why? It turns out that, if you tell a research subject "Pressing that button will earn you chips you can exchange for money," you get few schedule effects. But if you say, "There's a way you can get chips that you can exchange for money," encouraging the individual to explore, voilà, schedule effects! (3).

What do we make of this? One could say that schedule effects reflect being subservient to the reinforcer. But remember, they emerge among people not when given specific directions but when left to explore. So, one might say that they reflect gaining sensitivity, recognition, adaptability, flexibility. It is surely adaptive to respond differently to being able to get a reinforcer every 10 s than to a schedule delaying payoffs until 5 min have passed. It's part of why we are still around and dinosaurs are not.

Consider then the difference between getting directions on how to manage diabetes versus getting some principles and then exploring their impact. Albert Loro and our colleagues (4) found equal losses but, remarkably, greater continued loss until follow-up with a "self-initiated" approach

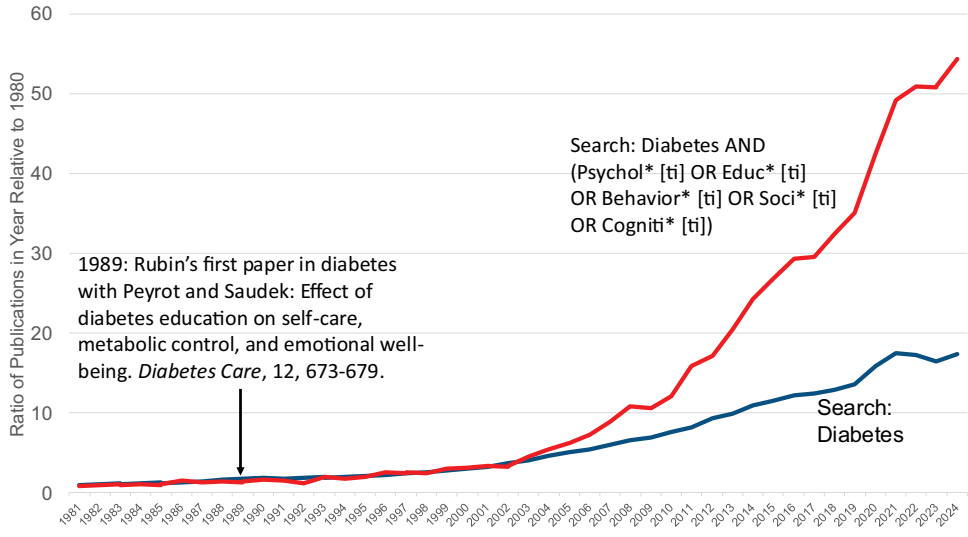

FIGURE 1 Proportional growth relative to 1980 (5,430%) in number of PubMed titles, 1981–2024.

to weight loss relative to the standardized, more prescriptive approaches of the 1970s. This emphasis on "self initiation" appears to be a key feature of the empowerment interventions of our time (5) and, if wisely deployed, of self–blood glucose monitoring, supporting people as they explore and become sensitive to their situation rather than trying to point them to the right thing. This also reflects the work of my colleagues and I on nondirective support (cooperative, nonprescriptive—as opposed to directive support: prescriptive, taking control) (6) or that on "autonomy" support (7).

A cautionary note: Back in 1968 Richard deCharms pointed out that the effect of the environment on feeling like an "origin" or a "pawn" depends on experience with the challenge (8). Just as too much structure leaves people feeling like pawns, too little structure may also evoke feelings of being a pawn among those facing a new challenge with which they have little experience. Titrating structure to readiness may be the key. For example, those who are newly diagnosed may benefit from more structure than those who have worked at managing their diabetes for more than a decade.

Mental Health and Diabetes

Much growth since the 1980s has included attention to mental health. The year after Dunn and Turtle exposed "The Myth of the Diabetic Personality" (9), Alan Delamater and colleagues and I were invited by the leading journal in clinical psychology to write a review of "psychological factors in diabetes and its treatment" as part of a 1982 special issue examining the "new" field of behavioral medicine (10). Growth since then has included the interweaving of psychology, mental health, and metabolism including through the immune system, behavior, and emotions (11). This included studies of Dick, David Marrero, and colleagues coming out of the Diabetes Prevention Program (12,13), or among adolescents with type 1 diabetes and their families (14). This work is joined by findings linking depressed mood, anxiety, and disease-related distress in many other conditions, e.g., asthma, cancer, COPD, and CVD.

How We Think About Mental Health

Two people can meet criteria for major depressive disorder of the DSM-5 with no features in common. The diagnosis requires five of nine features, several of which include two possibilities, e.g., weight gain/loss, insomnia/hypersomnia. Thus, as noted by Schmaling and Kaplan, "One person might experience depressed mood with hypersomnia, weight gain, fatigue, and psychomotor retardation; another might lose interest in activities while experiencing insomnia, weight loss, psychomotor agitation, and diminished concentration" (15). Same diagnosis, different problems. Similarly, there are 126 possible combinations of the five out of nine features required for a diagnosis of borderline personality disorder (16). What do we mean by talk about underlying disease? Think of the work done by the definite article in "the depression."

Skepticism about underlying disease or disorder is also encouraged by recognition that psychotherapy and pharmacotherapy do not treat diseases. They treat problems. Antipsychotic medications, for example, may reduce "positive symptoms" of schizophrenia like hallucinations or disruptive behavior but are generally ineffective with "negative" symptoms such as withdrawal or apathy (17). Anxiolytics reduce anxiety, and exposure-based therapies reduce anxiety or phobias elicited by specific situations but do not treat or eliminate some underlying anxiety disorder (18).

Focusing on problems may be more helpful than focusing on inferred diseases. Someone labeled as "schizophrenic" is more likely to be rehospitalized because they lose their job or housing than because they resume hallucinating. A recent review (19) examined 11 community-based interventions for those diagnosed as schizophrenic from nine countries. The interventions included components like individualized care plans, psychoeducation, cognitive modification, social skills, personalized community support, and resources such as peer support, vocational rehabilitation, and family involvement. Programs were associated with a range of benefits, including lower relapse rates, greater social functioning, less severity of symptoms, greater community engagement and support, and greater quality of life and well-being.

Turning back to diabetes, an online intervention for diabetes distress, MyDiaMate (20), currently the object of an effectiveness study, illustrates the strategy of focusing on specific interventions addressing a wide range of objectives: "goal setting, self-assessments, psychoeducation with tips and tricks and links to resources (e.g., peer support), cognitive and behavioral strategies and exercises (including relaxation, mindfulness), patient videos (testimonials), mood and energy journalling" all "adapted to local customs" in four different test countries. Further, the targets of intervention are also specified with modules on the following: "'Diabetes in Balance' . . . centered around common sources of diabetes distress . . . focus on coping with hypoglycaemia and related concerns . . . problems related to eating behaviour ('Food and Feelings'), stressful social interactions . . . following realistic goals . . . 'My Mood' . . . including [cognitive behavioral therapy]-based techniques for helpful thinking, stress management and mood repair. 'My Energy' . . . aimed at decreasing persistent fatigue . . . [with] evidence-based strategies, including restoring sleep/wake rhythm and engaging in activity scheduling."

Recognizing the wisdom of focusing on problems is important in integrating attention to mental health with diabetes care. We do not need training in psychology to apply to mood or relationship concerns the general problem-solving approaches of diabetes self-management, including

developing rapport and trust. We need not step aside or reflexively refer for specialty care for "the depression." Starting with the work of Washington University in St. Louis colleagues, Patrick Lustman along with Linda Griffith, Jeffrey Gavard, and Ray Clouse, who published key, early characterization of depression in diabetes (21), work has grown to recognize the interweavings among social and family contexts, stress, the immune system, mood, and metabolism (11) so that addressing individual problems, e.g., sedentary lifestyle, may at once be beneficial for both mood and metabolism.

We might consider parallels between an emphasis on specific problems and how we think about diabetes more generally. Do we treat diabetes, or do we treat glycemia, hypertension, hypercholesterolemia, or the foot, vision, microsvascular, macrovascular, and many other problems to which they lead? (22).

Context—the Family and Beyond

Reflecting on this problem-focused perspective and recognizing the many problems and challenges of diabetes, psychologist Barbara Anderson, social work faculty Wendy Auslander, and head of pediatric endocrinology, Julio Santiago, teamed up at Washington University in St. Louis in a series of studies showing relationships among *1*) key family characteristics including cohesion, encouragement of independence, and low conflict, *2*) youths' anxiety and self-concept, and *3*) better metabolic control, with use of the then new index of HbA_{1c} (23). Summarizing their work, the team emphasized not a disease entity or psychopathology but, rather, a "complex interplay … [among] psychological and physical functioning, metabolic control, and the family environment." At the University of Michigan, Anderson and colleagues continued to build evidence and publish key articles (24) to counter the disease entity perspectives still then alive in talk of, e.g., the "psychosomatic family."

Santiago's leadership at Washington University in St. Louis was followed by that of his successor as division head Neil White working with Alan Delamater (25) and Michael Harris (26) and leading to major collaborations such as with Tim Wysocki and their colleagues (27). With expansion to include, e.g., Kaitlyn Brodar, Denise Charron-Prochownik, Peggy Greco, Annette La Greca, and Jill Weissberg-Benchell, this family of investigators has replicated over 40 years the importance of social and family features like collaborative environment, low conflict, low criticality, and problem-solving. At the 85th Scientific Sessions of the American Diabetes Association, in 2025, 44 years after that first article of Anderson and colleagues, a poster by Wong, Hood, and their colleagues (28) showed relationships of warmth/acceptance, low conflict, and supportive involvement with low levels of diabetes distress.

Recognition of context also grew to include, e.g., emotional impacts on siblings (29), influence of patient-provider interaction on patient engagement (30), or social integration and support such as through church attendance (31). At Washington University in St. Louis, work on contexts grew as Elizabeth Warren-Boulton (32) and Joan Heins along with business school professor Walter Nord (33) showed how organizational factors influenced what we would now call "implementation" of diabetes education. Debra Haire-Joshu extended perspectives to examine how nursing education addressed diabetes management (34), while Susan Hopper, J. Philip Miller, and colleagues published one of the first studies of peer support—"home health aides"—in diabetes (35). Combining peer support with attention to organizational context, my University of Michigan colleague Olayinka Shiyanbola and her team (36) have examined the organizational features and program elements that support "peer ambassadors."

A Career-Changing Moment, Circa 1982

The 12-month follow-up of a weight loss program that emphasized self-control (37) included the following conversation:

- Participant 1: "How are you doing?
- Participant 2: "I lost about 14 pounds and have kept most of it off so it feels pretty good. How about you?"
- Participant 1: "I also lost about 14 pounds but gained most of it back so I joined Weight Watchers and have lost most of it again."
- Participant 2: "That must have made you feel bad, that you had to join Weight Watchers."
- Participant 1: "Well I figured some people have their book clubs, some people have their garden clubs, and I have my Weight Watchers."

The next morning, I said to our research team, "We need to start looking at social support."

Community Support, Peer Support, and Cultural Change

Most of my attention since that conversation has been directed toward social support including interventions in communities (38) and worksites (39) as they are prime structures for social support. The Robert Wood Johnson Foundation (RWJF) Diabetes Initiative also addressed how support for diabetes management could be enhanced through communities as well as primary care (40). A primary emphasis across the 14 sites of the Diabetes Initiative turned out to be peer support through community health workers, promotores, etc. (41). Since 2007, Peers for Progress (42,43) has continued this emphasis, promoting peer support for health worldwide.

Reaching Populations

Perhaps the most challenging of criteria for program evaluation is reach. Estimates of the low percentages reached by diabetes prevention or diabetes self-management education are discouraging. In an earlier collaboration with pediatric allergist Robert Strunk, peer "asthma coaches" were able to reach 89.6% of mothers of children who were Medicaid covered and had been hospitalized for asthma. The coach intervention also reduced subsequent hospitalizations by 52% (44). Extending this approach with Alivio Medical Center in Chicago, IL, in collaboration with the National Council of La Raza (now UnidosUS), Compañeros de Salud was able, over a 2-year period, to engage 82% of all 3,316 Alivio patients with diabetes through group classes, activities, and quarterly contacts via phone or in conjunction with clinic visits (42). They also reached 88% of 471 high priority patients (HbA_{1c} >8%, psychosocial distress, physician recommendation) through the addition of biweekly phone calls, decreasing to monthly as progress warranted. HbA_{1c} declined from 8.22% to 8.14% ($P < 0.05$) over 2 years in the entire sample and declined from 9.43% to 9.16% ($P < 0.01$) within the high priority group. These changes, of course, are small relative to those among selected research samples but perhaps still are remarkable given that they were obtained among the whole population of adults with diabetes served by Alivio and the generally linear relationship between changes in HbA_{1c} and benefit (45).

Sustained Changes in Peer Support in the Shanghai Integration Model

As president of both the Chinese Diabetes Society and the Shanghai Sixth People's Hospital Affiliated to Shanghai Jiao Tong University, Professor Weiping Jia led development of the Shanghai Integration Model that links primary care with tertiary and specialty care (46). With collaboration with additional Shanghai colleagues including Yuexing Liu and Chun Cai, the Shanghai model provided an umbrella for peer support implemented through Community Health Centers (CHCs). In an initial study (47), citizens of neighborhoods served by nine CHCs were trained to provide a variety of peer support activities, e.g., coleading diabetes education classes, group sessions on diet and nutrition or food preparation, exercise and dance, and including activities like karaoke to promote solidarity among those with diabetes. Significant improvements over 12 months were achieved for a variety of clinical and quality of life measures, and these were more pronounced among those with elevated measures at baseline. Even after research staff's active support of the program ended at 12 months, HbA_{1c} for all participants, which had improved from 7.62% at baseline to 7.53% at 12 months, was sustained to 7.53% at 18 months. This was more pronounced among those ≥8% at baseline, from 9.25% to 8.64% at 12 months and 8.54% at 18 months. Parallel improvements to 12 and 18 months were observed for blood pressure, the eight-item Patient Health Questionnaire (PHQ-8) measure of depressed mood, and a brief measure of diabetes distress adapted from the Diabetes Distress Scale (48).

Peer Support and Emotional Well-being

Peer support interventions have been shown to be effective for a variety of mental health and emotional problems, including reducing depression in India (49) and postpartum depression in Pakistan (50). In a scoping review, seven of nine studies of peer support for people diagnosed with schizophrenia, considered one of the most intractable as well as costly sets of mental health problems, showed varied and significant benefits relative to control participants (51).

With psychological challenges in diabetes, studies have also shown benefits of peer support. Led by Juliana Chan in Hong Kong (52) peer support reduced each of depression, anxiety, and stress as well as hospitalizations (53) among those with elevated baseline scores on the Depression Anxiety Stress Scale. Similarly, peer support in Alabama reduced hospitalizations and acute care relative to usual care among adults with diabetes and baseline mild or moderate depressive symptoms (54). Other studies have included systematic reviews showing benefits for quality of life (55) and several studies showing benefits for anxiety, depressed mood, quality of life, and/or diabetes distress (56–59) with the addition of peer support to diabetes education. As above, peer support in Shanghai achieved reductions in depressive symptoms and diabetes distress, maintained to 18 months (60). Findings were robust, similar across age, diabetes duration, and sex.

Communities as Base for Peer Support

Among the nine CHCs in Shanghai, research staff ratings of implementation (e.g., numbers of peer leaders, active leadership of CHC staff) turned out to be associated with outcomes, including changes in HbA_{1c}, the 4-item measure of diabetes distress, and participants' ratings of neighborhood support (e.g., " . . . other people in your neighborhood understand the importance of diabetes management"). This led to recognition that CHCs vary in resources or readiness to support peer leaders.

To reduce reliance on CHCs, 12 additional communities in Shanghai developed the Peer Leader program with involvement of a wider range of community resources, including district and subdistrict health promotion departments, residential committees (the basic organization of shared community management and services within a neighborhood), local self-management groups (of >6,000 across Shanghai in which residents share interests in various health issues), and nongovernment organizations as well as CHCs (61). As portrayed in Fig. 2, program planning identified three levels of program, from things all groups could execute at level 1 to Peer Leader services for individuals and families at level 3.

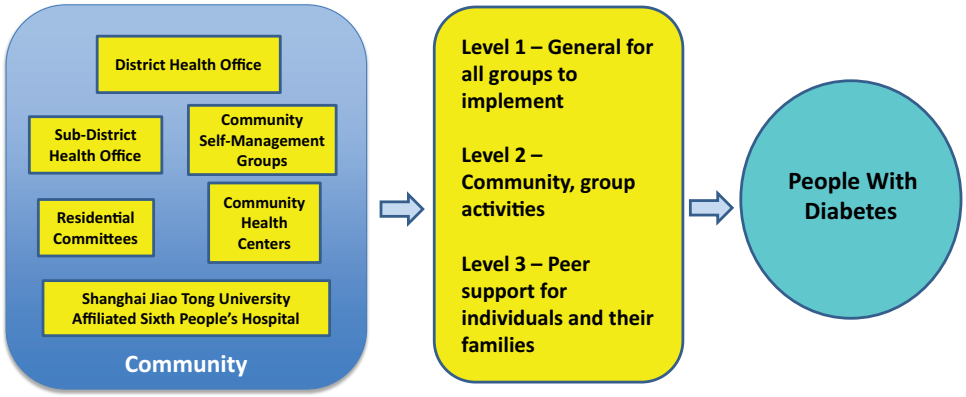

FIGURE 2 Organization of community resources and program levels for peer support in Shanghai. Adapted with permission from Liu et al. (47).

The complexity of diabetes leads to a wide variety of and thereby potentially confusing messages. The intake worker may call it "blood glucose," the nurse, "glucose levels," and the physician, "A1C" without the patient realizing they are all talking about the same thing. In response, for level 1, the Shanghai team developed "5 Key Messages that Everyone Should Know About Diabetes." With input from international colleagues, these were drafted and then revised by Professor Jia and Shanghai colleagues to fit a Chinese cultural standard of four characters each, as shown in Fig. 3. The resulting video (https://shorturl.at/YfVk9 with English translation) was then used to create common messages across the initiative. Also at level 1, the Shanghai Municipal Health Commission's Department of Health Promotion collaborated in designing "6 Diabetes Modules" to be offered by CHC staff and peer leaders.

Relative to four comparison communities, significant improvements at 24 months were found for HbA_{1c}, BMI, fasting blood glucose, and depressed mood on the PHQ-8 (61). Supporting the community approach, ratings of neighborhood support were higher in the 12 communities than in the four comparison communities, 3.54 vs. 3.00 on 5-point scale, respectively ($P < 0.001$) (Y. Liu, C. Cai, J. Tian, L. Shen, P.Y. Tang, M.M. Coufal, H. Chen, M. Evans, Y. Qian, W. Yu, Xiaoyu Wu, Xiaobing Wu, E.B. Fisher, W. Jia, unpublished analyses). Additionally, higher ratings of neighborhood support were associated with improvement in HbA_{1c}, the 4-item measure of diabetes distress, and the PHQ-8 measure of depressed mood. Ratings of neighborhood support also mediated the effects of the intervention on each of these end points.

The 12 communities adapted the standardized resources to meet their needs and take advantage of their resources. For example, different groups (e.g., health offices or CHCs) took different levels of responsibility for programs. There was also variable implementation around program features, e.g., an average of four to five approaches to disseminating the "5 Key Messages" (62).

Community capacity turned out to be an added benefit of the engagement of diverse community groups. As the 2019 coronavirus disease pandemic commanded the attention of CHCs, the peer leaders were able to continue some promotion of diabetes management through social networking, and to contribute to neighborhood efforts to cope with the pandemic such as grocery distribution to elderly citizens.

FIGURE 3 Five key messages that everyone should know about diabetes. Image reproduced with permission. The full video can be viewed at https://shorturl.at/YfVk9.

Community and Culture

The role of culture is insufficiently examined in our work. A PubMed search (21 December 2025) of articles with 20 terms for peer support in titles (e.g., "peer-support," "community health worker," "promotora," "lay health worker") yielded 12,937 entries. Adding cognates of "culture" in titles or abstracts reduced that to 999 (7.7%).

In the state of Kerala in India, the Kerala Diabetes Prevention Program (K-DPP) (63) countered Western individualistic models in favor of promoting healthy options collectively. Led by Brian Oldenburg, K.R. Thankappan, Sathish Thirunavukkarasu, and an international team of investigators, decision-making and problem-solving were considered from the perspective of the household, and healthy lifestyles were promoted with explicit support and help of families as well as peer groups and the community at large.

The K-DPP was organized at the neighborhood level of "polling places," intended to focus activities on those who would share social networks and local resources. Peer leaders were chosen by fellow group members at the start of the program, were trained, and then conducted remaining group sessions in community settings (e.g., reading rooms, participants' homes). A range of community activities supported lifestyle change (e.g., yoga sessions, walking groups, kitchen garden training, and cooking competitions). Community organization included partnerships with stakeholder organizations and identification of Local Resource Persons available to groups and peer leaders.

Across 60 polling places (63), conversion to diabetes over 24 months among those with impaired glucose tolerance at baseline was significantly lower among those randomized to K-DPP versus control (relative risk 0.66; $P = 0.038$). This replicated in a community peer program in India results previously reported in the U.S. Diabetes Prevention Program (64) as well as major international trials. K-DPP also achieved reductions in 10-year cardiovascular risk (65).

The emphasis of the K-DPP on building a culture around good health was reflected in engagement in community activities. For example, 41% of participants engaged in walking groups, 40% in kitchen garden training, and 31% in yoga training. Being from participants' neighborhoods, peer leaders were readily available for support outside group sessions so that 75% of participants reported an average of 11 contacts outside sessions, while 70% reported an average of 9 with other participants. Community engagement also included spreading many activities to the broader communities in which the program participants lived. Whether these kinds of community, social, and cultural changes may prove to have sustained the clinical benefits of K-DPP is a topic of forthcoming research from the investigator team (66). The attention to cultural perspectives and integration of peer and community support of the K-DPP have now also been adapted to other states in India and other countries in Asia and sub-Saharan Africa.

Continuing the emphasis on culture, DiabetesSisters is a community for women with diabetes. Organized through a Web portal (diabetessisters.org), DiabetesSisters provides intentionally varied points of entry and types of activities and resources, including live virtual gatherings (D. Rice, M. Polz, personal communication), all to reflect the diverse cultural and other circumstances of women with diabetes. The impacts of intended variation include 40.8% of 9,307 email subscribers engaged with DiabetesSisters for more than a decade and 51.8% of responders to the 2024 annual survey reporting visiting the website at least monthly. Patterns of use also reflect the intentionally varied resources offered: 56.1% of survey respondents engaged with video content (including live, recorded, or on-demand webinars), 44.1% accessed blogs or newsletter articles, 30.3% joined live meet-ups, and 15.7% participated in workshops. Use of this intentional variety of resources underscores the value for engagement of a community with "many doors," "many good practices."

Responses to open-ended survey questions also suggested a culture of community: DiabetesSisters "has given me the opportunity to connect with incredible diabetes friends (sisters) who truly understand the journey. I never feel alone because I'm just a click away from a supportive community that's always there to help and encourage me" and, more concisely, "Made me feel like I'm not alone."

Rather than a single definition or role of the peer supporter, peers in the K-DPP and DiabetesSisters may be seen as group leaders, individual supporters, neighborhood contacts and program ambassadors, network members, simply "sisters" with diabetes, or neighbors seeking to prevent it. That peer support may extend from a service provided by peers to broader mutuality is also reflected in the K-DPP emphasis on family, collaborative, and group decision-making, rather than on individual decision-making, execution, and responsibility. Additionally, a variety of options were apparent in the programs' activities, such as the garden clubs of the K-DPP and the meet-ups, webinars, and blogs of DiabetesSisters. All of these activities were established using venerable features of community organization including engagement of community, respect for culture and values, and local ownership (67,68).

Putting it all together, community organization provides a base for synergy among diverse peer roles, intended variety of activities and resources, and mutuality. The result is not a single best practice or "magic pill" but, rather, a comprehensive culture of supports for healthy behaviors, health, and well-being.

Flexible, Adaptable Standardization by Key Function

What is the practitioner to do when told that the 90-min sessions of a well-researched intervention will need to be converted into 60-min sessions by a worksite eager to adopt it? What if a church or mosque wants religious messages woven into standardized material on healthy diet and exercise? Beyond such challenges, formative evaluation of groups' perspectives and needs will identify ways in which standardized protocols need to be refined to reach those they might benefit.

The question is not whether to standardize but what to standardize. If the original included setting behaviorally specific "action plans" for incorporating physical activity into daily routines, would it be sufficient to replace this with only a discussion of perceived efficacy? On the other hand, if materials were originally printed on red paper, does switching to blue paper matter?

Both the RWJF Diabetes Initiative and Peers for Progress faced the challenge of promoting approaches across diverse settings and populations. To guide this, both

programs distinguished function versus aspect, key ways in which the program is thought to work versus incidental aspects of how it is implemented (69,70). Key functions need to be included. How they are implemented may be adapted as circumstances suggest.

The Diabetes Initiative identified six key functions or "Resources and Supports for Self-Management": *1*) individualized assessment, *2*) collaborative goal setting, *3*) skills for self-management, *4*) ongoing follow-up and support, *5*) community resources, and *6*) continuity of quality clinical care (40,71). Review of the 14 projects of the Diabetes Initiative indicated varied approaches to implementing these. For example, collaborative goal setting " . . . may be accomplished by motivational interviewing, an intervention based on the transtheoretical model, or an interactive e-health resource. What counts is not so much which of these is most effective in a trial in a university research setting but that the one chosen is generally effective, is feasible in the setting in which it is to be used, and is pertinent and acceptable to the population for which it is intended" (40).

Using a similar strategy, Peers for Progress identified four key functions of peer support to guide global dissemination (62,72): *1*) assistance in daily management, *2*) social and emotional support, *3*) linkage to community and clinical resources, and *4*) ongoing availability of support. Subsequent work, including Megan Evans' dissertation on peer support with people labeled as schizophrenic (51,73,74), identified three more: *5*) shared lived experience, such as similar clinical problems, community, or cultural setting, *6*) individual or system advocacy—encouraging individuals' actions on their own behalf and/or representing individuals' needs within organizations, and *7*) "being there" including social activities and explicit focus on companionship.

The key functions have been useful in defining what is and what is not peer support. For example, highly scripted classes implemented by a nonprofessional may be of great value but may not constitute peer support according to the key functions. The functions may also help make sense of peer support interventions with disappointing results (72). Unpublished analyses in Shanghai (61) showed that participants' reports of these peer support functions predicted improvements in HbA_{1c}, diabetes distress, and depressed mood.

Given the poor reach of diabetes self-management education, a lesson from the Diabetes Initiative (40) was that, instead of a few best practices, there should be "many good practices." Using key functions as a template encourages intentionally varied activities, all sharing, however, a basis in evidence.

Reflection

This article sets out, I hope, the importance of complexity and contexts in diabetes, from the families who nurture us to the communities in which we live, and across the interweaving of biology, behavior, psychology, and the broad socio-ecological surround.

Preparing this article and the talk on which it is based provided a time for reflection. It is satisfying to think that some of the things to which I have had the opportunity to contribute may make the world just a little bit better. Sticking with me for now >60 years, however, was the observation of a speaker at some high school event, "We are remembered less for what we do than who we are." This is reflected, again, in Mark Peyrot's remembrance of Dick Rubin, noting that, for his memorial service in Baltimore, "people . . . flew in from all over the country . . . to share their memories, not of his numerous accomplishments, but of what Richard meant to them" (1).

Thinking of Dick takes me back many years to graduate school in clinical psychology at Stony Brook (1968–1972) when I was wondering what to aim for in my career. In addition to my wonderful mentors, Gerald Davison, Leonard Krasner, Howard Rachlin, Stuart Valins, and Robin Winkler, another Stony Brook professor, Marvin Levine, seemed a good model. Marv was a splendid experimental psychologist who opened a whole line of research on how humans learn through "hypothesis testing." He was also a poet, a bridge Life Master, a fine clarinet and recorder player, and student/colleague with major contributors to 20th century psychology, Harry Harlow and B.F. Skinner. Often encouraged to write a book on his important work, he demurred, claiming the data were not quite ready until 16 years after his first publication on hypothesis testing (75,76). Marv was highly regarded by those in his field but outside of that surely not "famous." He seemed to me to have it about right. Focus on the work, try to do something of value, seek the respect of those who understand what you're doing, and don't worry too much about the rest.

We are perhaps best distinguished by our affections: Those we love. Those who love us. The causes in which we place our passion. Alan Delamater and David Marrero, each distinguished in our field and former Rubin awardees, nominated me for the Rubin award. As much as I appreciate the award, I appreciate even more the respect and affection of Alan and David, as well as being part of the important work we all share, all amidst Richard Rubin's fine and sustained karma.

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