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Evaluation of the effect of ICCC model based comprehensive intervention with community participation initiative on diabetic blindness

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基于ICCC模型以社区参与为主预防DR致盲的综合干预效果评价

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摘要

目的:评估在内蒙古自治区包头市实施的基于ICCC模型以社区参与为主预防糖尿病视网膜病变(DR)致盲的综合干预进行效果。

方法:共470例DR患者纳入本研究,并分为对照组和研究组。对照组接受传统以卫生机构主导的慢病管理模式进行干预预防糖尿病视网膜盲,研究组接受基于ICCC模型重新设计的以社区参与为主的综合干预。在干预前的和干预1a后的调查中分别对预防糖尿病视网膜盲所需具备的知晓知识、正确的信念和采取的行为(KAP)进行了测量以评价不同干预策略的效果。使用卡方检验和t检验评价干预效果情况,使用多元线性相关分析对干预效果的影响因素进行分析。

结果:在基线调查中235名病人进入对照组,235名病人进入研究组。在终末研究中对照组208名病人,研究组216名病人接受了调查。研究组在终末研究中关于糖尿病致盲及预防知识的正确知晓率、正确信念持有率、期望行为采纳率均比基线调查有显著提高,同时均比对照组有显著提高,差异具有统计学意义。多元线性回归分析显示研究组别、受教育水平和糖尿病病程是预防糖尿病盲的知晓情况的影响因素;研究组别和受教育水平是预防糖尿病盲所采纳的期望行为的影响因素。

结论:在预防糖尿病盲的眼健康管理策略中以社区参与为主的综合管理方法比传统的管理方法具有更好的效果。

关键词:糖尿病眼保健;干预策略;效果评价

Abstract

• AIM: To evaluate the effect of ICCC based comprehensive intervention with community participation initiative on diabetic blindness prevention in Eye Health Management of Baotou.

• METHODS: Totally 470 diabetic patients newly registered within 3mo in local community health center were recruited in the study by random sampling. The control group received conventional public health service from chronic disease management approach with medical organization initiative on diabetic blindness prevention, and study group received comprehensive intervention based on ICCC model with community participation initiative. Informative knowledge, beheld accurate beliefs and acting behavior (KAP) in preventing diabetic blindness were measured in baseline survey before intervention and final survey after 1 y intervention in both groups respectively to evaluate the effect of different eye health management approaches on diabetic blindness prevention. Chi-square test and t-test were used to compare the effect of intervention and multiple linear regression analysis was used for analyzing influencing factors.

• RESULTS: With 235 in control group and 235 in study group in baseline survey, and 208 and 216 in final survey. For study group accurate knowledge informative rate, accurate beheld belief rate and desired acting behavior rate in all the items of questions regarding diabetic blindness and its prevention in the final survey were all significant higher than the ones in baseline survey, and

were significantly higher than that in control group. Multiple linear regression analysis showed that group type, educational level and DM duration were the influencing factors on the level of the knowledge. Group type, educational level and gender were the influencing factors on the level of beheld belief. Group type and educational level were the influencing factors on the level of acting behaviors in preventing diabetic blindness.

• CONCLUSION: Comprehensive intervention with community participation initiative on managing diabetic eye health to prevent diabetic blindness had better performance compared to traditional intervention, thus it is an effective strategy in promoting diabetic eye health among diabetes.

• KEYWORDS: diabetic eye care; intervention strategy; effect evaluation

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INTRODUCTION

Diabetes mellitus (DM) is a chronic and intractable lifelong disease. As one of the complications of DM, diabetic retinopathy (DR) has become one of the main reasons causing blindness and posed heavy economic burden on patients' families and society as well. Regular eye examinations have been recommended to insure early detection and treatment of DR, at the time when laser photocoagulation therapy is most effective for preserving sight[1]. The risk of vision loss and blindness is proven to be reduced with regular examinations, early detection and appropriate laser treatment by some 90%[2]. Despite that widely accepted consensus guidelines recommend annual retinal examinations for diabetic patients and given the proven benefits of early detection, many patients do not follow the guidelines due to various reasons. On average, less than 50% of diabetic patients in the United States meet these recommendations[3-5]. According to the studies in different countries, main barriers to the compliance are DM patients' lack of perception, related knowledge toward diabetic eye care and low compliance to seek regular eye check to prevent diabetic blindness[6-10]. Educational programs can improve patients' KAP and thus compliance to routine diabetic retinopathy screening in promoting diabetic eye care with different patterns and approaches[11-16], such as BASNEF model or Procede - Proceed model. Evidence provides that CCM model oriented intervention is effective in improving the health of people who have diabetes and receive care including eye care in primary care settings[17]. This study compared the effect of community based intervention with different strategies in improving diabetic eye care, and evaluated the effect of ICCC based comprehensive intervention with community participation initiative on diabetic blindness prevention in Baotou city of Inner Mongolia Autonomous Region.

SUBJECTS AND METHODS

This was a perspective and experimental intervention study. Research population were type II diabetic patients diagnosed based on WHO standard in 1999[18] who have registered in Baogang 4th community health center from October 2015 to September 2016 were enrolled in this study. Those who have mental disorders and little self-care ability in daily living were excluded. The intervention lasted for 1y from January 2017 to December 2017. All participants were informed and consented to participate the study voluntarily. DM patients were divided into two groups by random sampling. Patients in the control group received diabetic eye health education as part of conventional chronic condition management strategy, which was initiated and conducted by community health care center. The patients in the study group received eye health educational activities that were initiated, organized and conducted by community based social service organization. Both groups received baseline survey and final survey before and after different approaches of intervention.

Questionnaire The questionnaire was designed by ophthalmologist, general practitioner, and public health specialist after reviewing related documents. The Cronbach's coefficient was 0.909. By Cronbach alpha and factor analysis the questionnaire reflects high reliability and validity. Two parts were included in the questionnaire, one part is about general information, and the other part is about the patients' awareness, perception and understanding, and behavior status towards diabetic blindness prevention, which includes 3 dimensions with 35 items of questions. Among them there were 20 questions regarding diabetic blindness prevention related knowledge, 1 point for correct answer, no score for wrong answer, and 20 points in total; 10 questions for diabetic blindness prevention beliefs by Likert scale, with the highest score of 2 points, lowest of -2 points, and 20 points in total; 10 questions for diabetic eye health related behaviors by binary scale, with 1 point for answer of yes, no score for answer of no, and 10 point in total. The questionnaire was distributed through door to door visit in community and data was collected by face to face structured interview. Baseline survey for both study and control groups was conducted by the questionnaire in January of 2017, and final survey with the same questionnaire for the same groups was conducted in December of 2017.

Intervention Strategy and Method

Control group As part of community health service, chronic disease management service including diabetic care was provided by local Community Health Center (CHC). Conventional chronic disease management approach initiated by medical organization was conducted as follows: 1) Each community team from local CHC was comprised of 1 GP, 1 nurse and 1 health care staff for children or women. There were 16 teams in charge of service for 22036 inhabitants; 2)

Community team established health records for all chronic patients; 3) GP provided outpatient service, one on one consultation, and referral, *e.g.* diabetic eye check once diabetes was diagnosed, in CHC; 4) Community team paid home visit on yearly basis measuring blood pressure and blood sugar, communicating health information including diet, exercise, medication, and complication prevention including DR; 5) Community team made phone made phone calls to patients and appointments for them to visit back to CHC on quarterly basis, and health lectures was some time given in education room in CHC; 6) Irregular community based educational and screening activities were organized normally on the Theme Day, such as World Diabetes Day, and the theme in 2017 was lectured by expertise from higher level hospital on renal damage of diabetes.

Study group This group was managed by comprehensive intervention with community participation initiative as follows: 1) Community partnership: through this project CHC collaborated with one local community health promotion NGO called Xintu as community partner. Xintu provides social service purchased by government and other foundations in community disability rehabilitation, preventing dementia and home care, and fall of elders in community; 2) There were 7455 households in the community with inhabitants of 22036. Community team members included 1 professional social worker as community manager in charge, 1 head of community activity center (CAC) responsible for the running of the CAC, 30 community health ambassadors (CHA) who were the main social service providers, 1 intern with social work or public health background, 1-2 volunteers. There were 3 such teams in this community. These CHAs were with multiple background such as ordinary people, opinion leader, retired officials, retired medical staff, chronic disease patients, DM/DR patients, family members of patients, but something in common was that they were right from local community, well trained, interested in health promotion and dedicated to help. CAC was a building provided by local government where local people can get open access to it and make use of the infrastructure and facilities to enrich their spare time. It was also a place for community members to communicate with, learn from and support each other; 3) Training: Xintu provided community team with training on social work methods and tools such as enquiry and communication skills, needs assessing technique, and how to organize community activities. As technical support CHC trained community team on the very basic knowledge of chronic diseases and behavioral factors in controlling chronic conditions and complications including diabetic blindness by making the resources of GP, public health expertise and other specialists such as endocrinologists and ophthalmologists. And guideline and tool-kits on managing diabetic health including eye health was produced; 4) Based on the patient record provided by CHC, community team conducted household visit twice a month to evaluate the progress in managing diabetes and its complications by tool-kits. Recorded needs such as requesting GP or referral; timely reminded patients for follow up on quarterly basis and eye check (at the beginning and by the end of this project with one year interval) by phone calls, and new media platform such as Wechat; 5) Reports and feedback from home visit were discussed on the meeting with GP on the following weeks of home visit, further advice will be returned to patients; 6) Regular diabetic care activities were held in local CAC 1-3 times a week. Activities were in different forms such as peer group support, diabetes club, lectures by GP, and community screening activities, and other healthy cooking contest, walking contest, and drama show experiencing the experience of blindness *etc*. CHA called for participation of diabetes patients, and the head of CAC responsible for preparing and organizing each activity; 7) Health information was communicated and updated by social media including new media platform; 8) Community team organized "Theme Day" activity such as on "International eye care day" "International diabetes day", "project kick off meeting or workshop" by inviting local government officials and public to attend to increase the awareness of public and get the support of government; 9) Newsletters were delivered to local health bureau on quarterly basis to inform the performance and achievements of community health promotion efforts, which was helpful in turn to win the support of local government. The principles outlined in the Declaration of Helsinki was followed when the study was conducted in local community.

Statistic Method Epi Data 3.1 was applied for data double entry, and SPSS 17.0 was applied for data description and analysis. Categorical data is expressed by frequency (N) and constituent rate (%), and the difference is compared within and between groups by χ^2 test. Numerical data is expressed by mean±SD, and the difference is compared by matched pair t-test and independent sample t-test. Multiple linear regression analysis was applied in analyzing influencing factors of KAP. P value of <0.05 was considered statistically significant.

RESULTS

General Information Study population 470 cases of type II diabetic patients diagnosed based on WHO standard in 1999[18] who have registered in Baogang 4th community health center from October 2014-September 2015 were enrolled in this study. With 235 patients in the control group, the other 235 patients in the study group. All 470 cases were investigated in baseline survey, and 424 cases were investigated in final survey in one year with 208 cases in the control group and 216 cases in study group. A total of 216 questionnaires were collected in the study group with an effective response rate of 91.9%, while 208 were collected in the control group with a response rate of 88.5%. General information of study population is shown as below, and there is no statistic difference between the study groups in characteristics (Table 1).

Table 1 General information (*n*/%)

Categories	Baseline survey (Pre intervention)		χ^2	*P*
	Control group	Study group		
Gender			0.704	0.401
M	105 (44.68)	96 (40.9)		
F	130 (55.32)	139 (59.1)		
Age, a			5.238	0.264
≦50	6 (2.54)	3 (1.28)		
51-	95 (40.43)	106 (45.11)		
61-	101 (42.98)	105 (44.68)		
71-	21 (8.94)	16 (6.81)		
≧80	12 (5.11)	5 (2.12)		
Educational level			6.696	0.153
Primary	66 (28.09)	83 (35.32)		
Secondary	115 (48.93)	109 (46.38)		
High school	36 (15.32)	32 (13.62)		
Bachelor	14 (5.96)	11 (4.68)		
Master and above	4 (1.70)	0 (0.00)		
DM duration (y)			3.176	0.529
≦5	162 (68.94)	176 (74.89)		
5.1-	33 (14.04)	30 (12.77)		
10.1-	28 (11.91)	19 (8.08)		
15.1-	10 (4.26)	7 (2.98)		
≧20	2 (0.85)	3 (1.28)		
In total	235 (100.00)	235 (100.00)		

Informative Knowledge Before and After Different Approaches of Intervention Strategy For control group under intervention of conventional medical organization initiative, accurate informative rate in the final survey (20.71%, 64.90%, 64.90%, 29.33%, 24.52% respectively) in the items of "Diabetes can cause irreversible blindness", "The relation between duration of diabetes and DR", "The relation between blood sugar and DR", "Laser treatment won't cause pain" and "Laser treatment is not a big surgery" were significant higher than that of baseline survey (14.04, 50.64, 47.66, 17.87, 10.64 respectively; $P<0.05$). There was no significant difference in other items before and after intervention. For study group under intervention of comprehensive intervention with community participation initiative accurate knowledge informative rate in the final survey in all the items were significant higher than the ones in baseline survey. There was no significant difference in accurate knowledge response for control group and study group before intervention. After intervention in the final survey the informative rate in all items in study group were significant higher than that in control group.

For control group the average score of informative knowledge in final survey (4.16±0.41) was significant higher than that in baseline survey (3.71±0.34) ($t=-2.561$, $P=0.03$). In study group the average score in final survey (10.12±1.42) was significant higher that in baseline survey (3.65±0.33) ($t=-28.53$, $P=0.000$). There was no significant difference in average score for control group and study group before intervention. After intervention the average score in study group (10.12±1.42) was significant higher than that in control group (4.16±0.41) ($t=-19.7$, $P=0.000$). (Table 2).

Beheld Belief Before and After Different Approaches of Intervention Strategy For control group under intervention of conventional medical organization initiative, the accurate belief rate in the final survey (36.06%, 46.15%, 28.37%, 48.56%, 26.92% respectively) in the items of "The inevitability of retina damage caused by DM", "The severity of vision damage caused by high blood sugar", "Importance of regular fundus check", "The willingness to receive laser treatment to prevent blindness even the vision is still ok" and "The confidence to overcome the fear of laser treatment" were significant higher than that of baseline survey (14.46, 17.45, 14.89, 35.32, 16.17 respectively; $P<0.05$). There was no significant difference in other items before and after intervention. For study group under intervention of comprehensive intervention with community participation initiative the accurate belief rate in the final survey in all the items were significant higher than the ones in baseline survey. There was no significant difference in accurate belief response for control group and study group before intervention. After intervention in the final survey the accurate belief rate in all items in study group were significant higher than that in control group.

For control group there was no significant difference in the average score of accurate beheld belief in final survey comparing to that in baseline survey ($t=-1.415$, $P=0.45$). In study group the average score in final survey (5.72±1.45)

Table 2 Comparison of informative knowledge in preventing diabetic blindness with different approaches of management strategy

n (%)

Informative knowledge in preventing diabetic blindness	Control group				Study group				χ^2/t	*P*
	Pre	Post	χ^2/t	*P*	Pre	Post	χ^2/t	*P*		
Diabetes can cause irreversible blindness	33(14.04)	58(20.71)	12.952	0.000	36(15.32)	132 (84.26)	100.967	0.000	47.302	0.000
The relation between duration of diabetes and DR	119(50.64)	135 (64.90)	9.179	0.003	107(45.53)	181 (83.80)	71.402	0.000	19.923	0.000
The relation between blood sugar and DR	112 (47.66)	135 (64.90)	13.301	0.000	139(59.14)	189 (87.50)	45.610	0.000	30.020	0.000
Blindness caused by diabetes can be prevented at early stage	32(13.62)	36(17.31)	1.157	0.294	34 (14.47)	159 (73.61)	160.816	0.000	160.861	0.000
Retina could have been damaged before vision is still fine for DM patients	22 (9.36)	21(10.10)	0.068	0.873	19(8.09)	133 (61.57)	144.116	0.000	121.406	0.000
Only continuous fundus check at least once a year can detect retina damage at early stage	22 (9.36)	28(13.46)	1.852	0.180	22(9.36)	137 (63.43)	144.125	0.000	111.281	0.000
Yearly fundus check is still needed even there is no visionsymptom	17 (7.23)	22(10.58)	1.536	0.242	19(8.09)	132 (61.11)	142.095	0.000	116.995	0.000
Laser treatment is the only way to prevent diabetic blindness	22 (9.36)	25(12.02)	0.822	0.440	23(9.79)	135 (62.50)	137.406	0.000	114.924	0.000
The benefit of laser treatment at early stage of DR	38(16.17)	34(16.35)	0.003	1.000	33 (14.04)	146 (67.59)	134.833	0.000	113.906	0.000
Severe outcome when missing the treatment opportunity	48(20.43)	59(28.37)	3.797	0.059	56(23.83)	154 (71.30)	101.915	0.000	78.120	0.000
Laser treatment won't cause pain	42(17.87)	61(29.33)	8.113	0.005	32(13.62)	181 (83.80)	222.413	0.000	128.322	0.000
Laser treatment is not a big surgery	25(10.64)	51(24.52)	14.585	0.000	28 (11.91)	163 (75.46)	186.164	0.000	111.554	0.000
Average score	3.71±0.34	4.16±0.41	−2.561[a]	0.03	3.65±0.33	10.12±1.42	−28.53[a]	0.000	−19.7[a]	0.000

[a]*t* value.

was significant higher that in baseline survey (2.45±0.62) ($t=-5.08$, $P=0.000$). There was no significant difference in average score for control group and study group before intervention. After intervention the average score in study group (5.72±1.45) was significantly higher than that in control group (2.72±0.23) ($t=-3.89$, $P=0.000$) (Table 3).

Acting Behavior Before and After Different Approaches of Intervention Strategy For control group under intervention of conventional medical organization initiative, desired acting rate in the final survey (70.19%) in the items of "Adherence to doctor's advice to take medication" was significantly higher than that of baseline survey (48.51%; $P<0.05$). There was no significant difference in other items before and after intervention. For study group under intervention of comprehensive intervention with community participation initiative desired acting rate in all the items were significant higher in the final survey than the ones in baseline survey. There was no significant difference in desired acting rate for control group and study group before intervention. After intervention in the final survey the desired acting rate in all items in study group were significantly higher than that in control group.

For control group there was no significant difference in the average score in desired acting behavior in final survey comparing to that in baseline survey ($t=-2.65$, $P=0.22$). In study group the average score in final survey (6.05±0.67) was significant higher that in baseline survey (4.36±0.49) ($t=-29.45$, $P=0.000$). There was no significant difference in average score for control group and study group before intervention. After intervention the average score in study group (6.05±0.67) was significantly higher than that in control group (4.41±0.73) ($t=-18.78$, $P=0.000$). (Table 4).

Associated Factors Influencing Related Knowledge, Belief and Acting Behaviors in Preventing Diabetic Blindness Multiple linear regression analysis was conducted respectively by taking group type (1 = medical initiative intervention as control group, 2 = community initiative intervention as study group), gender (1 = male, 2 = female), age (a), DM duration and educational level as independent variables, and final survey scores in related knowledge, beliefs and acting

Table 3 Comparison of beheld belief in preventing diabetic blindness with different approach of management strategy *n* (%)

Belief to prevent blindness caused by DM	Control group				Study group				χ^2/t	*P*
	Pre	Post	χ^2/t	*P*	Pre	Post	χ^2/t	*P*		
The inevitability of retina damage caused by DM	34 (14.46)	76 (36.06)	186.164	0.000	32 (13.62)	115 (53.24)	80.430	0.000	11.941	0.001
The severity of vision damage caused by high blood sugar	41 (17.45)	96 (46.15)	42.567	0.000	43 (18.30)	122 (56.48)	70.730	0.000	4.524	0.041
Significance between diabetic blindness and the course of DM	75 (31.91)	85 (40.87)	3.831	0.060	88 (37.45)	148 (68.52)	43.559	0.000	32.733	0.000
Importance of regular fundus check	35 (14.89)	59 (28.37)	12.770	0.000	34 (14.47)	134 (62.04)	108.956	0.000	48.444	0.000
The self efficacy to seek yearly fundus check even no obvious vision problem is present	30 (12.77)	39 (18.75)	3.005	0.089	33 (14.04)	126 (58.33)	96.726	0.000	69.843	0.000
The willingness to receive laser treatment to prevent blindness even the vision is still ok	83 (35.32)	101 (48.56)	7.963	0.005	76 (32.34)	143 (66.20)	51.668	0.000	13.506	0.000
The confidence to overcome the fear of laser treatment	38 (16.17)	56 (26.92)	7.632	0.007	45 (19.15)	138 (63.89)	93.434	0.000	58.338	0.000
Average score	2.57±0.41	2.72±0.23	−1.415[a]	0.45	2.45±0.62	5.72±1.45	−5.08[a]	0.000	−3.89[a]	0.000

[a]*t* value. DM: Diabetes mellitus.

Table 4 Comparison of acting behavior in preventing diabetic blindness with different approach of management strategy *n* (%)

Behaviors to prevent diabetic blindness	Control group				Study group				χ^2/t	*P*
	Pre	Post	χ^2/t	*P*	Pre	Post	χ^2/t	*P*		
Adherence to doctor's advice to take regular exercise	133 (56.60)	121 (58.17)	0.112	0.773	123 (52.34)	159 (73.61)	21.733	0.000	11.260	0.001
Adherence to doctor's advice to take diet control	135 (57.45)	138 (66.34)	3.695	0.063	131 (55.74)	186 (86.11)	49.696	0.000	22.968	0.000
Adherence to doctor's advice to take medication	114 (48.51)	146 (70.19)	21.394	0.000	111 (47.23)	187 (86.57)	77.707	0.000	16.870	0.000
Adherence to doctor's advice to take regular fundus check	38 (16.17)	45 (21.63)	2.164	0.146	34 (14.47)	146 (67.59)	132.448	0.000	90.410	0.000
Average score	4.22±0.57	4.41±0.73	−2.65[a]	0.22	4.36±0.49	6.05±0.67	−29.45[a]	0.000	−18.78[a]	0.000

[a]*t* value.

behaviors as dependent variables. The results showed that there was a positive linear regression relationship between the group type, educational level, DM duration and the level of knowledge in preventing diabetic blindness. Group type, educational level and DM duration were the influencing factors on the level of the knowledge in preventing diabetic blindness. Group type (study group with community initiative intervention strategy) influenced most on the level of the knowledge in preventing diabetic blindness. The average point in study group with community initiative intervention strategy scored 5.121 points more than that in the control group with medical initiative intervention strategy. There was a positive linear regression relationship between the group type, educational level, gender and the level of beheld beliefs in preventing diabetic blindness. Group type, educational level and gender were the influencing factors on the level of the beheld belief in preventing diabetic blindness. Group type (study group with community initiative intervention strategy) influenced most on the level of beheld beliefs in preventing diabetic blindness. The average point in study group with community initiative intervention strategy scored 2.466 points more than that in the control group with medical initiative intervention strategy. There was a positive linear regression relationship between the group type, educational level and the level of acting behaviors in preventing diabetic blindness. Group type and educational level were the influencing factors on the level of acting behaviors in preventing diabetic blindness. Group type (study group with community initiative intervention strategy) influenced most on the level of acting behaviors in preventing diabetic blindness. The average point in study group with community initiative intervention strategy scored 2.466 points more than that in the control group with medical initiative intervention strategy (Table 5).

DISCUSSION

As part of the chronic disease management aim to promote diabetic eye health can be achieved through educational

Table 5 Multiple linear regression analysis on influencing factors for the level of related knowledge, beliefs and acting behaviors in preventing diabetic blindness

Variables	B	SE	β	t	P
Knowledge					
Constant	8.141	0.532	0.000	19.235	0.000
Group type	5.121	0.480	0.314	19.756	0.000
Educational level	1.268	0.132	0.233	5.361	0.000
DM duration (y)	0.699	0.221	0.116	3.437	0.017
Beliefs					
Constant	4.890	0.212	0.000	3.63	0.001
Group type	2.466	0.117	0.334	3.891	0.000
Gender	0.534	0.153	0.089	1.037	0.042
Educational level	1.066	0.187	0.267	2.084	0.005
Acting behaviors					
Constant	5.344	0.476	0.000	8.987	0.000
Group type	1.35	0.105	0.375	18.782	0.000
Educational level	0.789	0.135	0.147	3.546	0.000

B: Regression coefficient; SE: Standard error; β: Standardized regression coefficient; DM Diabetes mellitus.

strategies. In our study educational intervention effect of different approaches of strategy were compared and it showed that the control group with traditional medical organization initiative was effective on improving part of the accurate informative knowledge, beheld belief and acting behaviors in preventing diabetic blindness, at the same time the study group with comprehensive intervention activities with community participation initiative improved all the items of related knowledge, belief and acting behaviors. And it also indicated that study group had better performance regarding the improvement of KAP.

It is important and essential that educational strategy to help and facilitate the patients and families for effective management[19] in terms of uptaking the behavior of yearly fundus check through effective communication to improve the knowledge and perception in diabetic eye care. But effective management needs time, methods and techniques to reach out patients and communication closely and deeply with patients and public. And in general the staff in charge of chronic disease management are mainly clinical expertise, who are very busy with their clinical work and have very little time nor social work methodology to work on patients and convince patients to adopt expected behavior. Our study based on ICCC framework (Figure 1) rethinks the role of community empowerment and redesign[20-21] the chronic management approach in diabetic blindness prevention by strengthening the role of community partner, who plays an important role in reaching out targeting population, assessing their needs and barriers in preventing diabetic blindness in the first place, mobilising community participation in raising awareness of the society on diabetic eye care, communicating diabetic eye care information through multiple channels and uptaking regular diabetic retinopathy screening. Comparing to costly (valuable

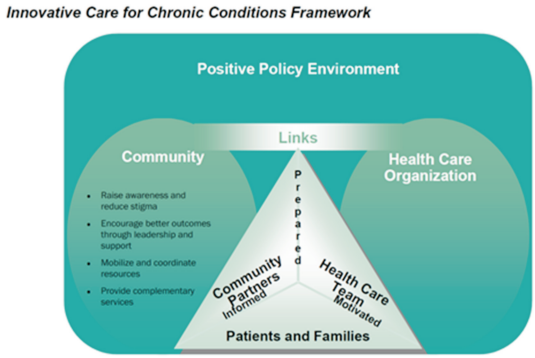

Figure 1 ICCC model.

in time and service) medical team who is good at clinical service, the advantage of community initiative approach is to make full use of community resources who are good at social work methodology such as communicating skills and organizing community activities, together with the support of medical team of health organization, the management effect can be more cost effective. This comprehensive approach emphasizes mobilization of multiple resources including social, medical and governmental, has shown effectiveness in educating diabetic patients and preventing diabetic blindness.

More and more study and practice have been adopted for the exploration of innovation in chronic disease management[22-23]. In China chronic conditions including complications have been under management but it is still at early phase especially with regards to the application of evidence based guidelines and there is still lots of room for improvement[24]. Some internationally promoted chronic condition management theories and models have not been studied, applied or evaluated. In our study more research is needed to observe the impact of the strategy in the long run such as remaining vision function of DM patients. Additional research efforts should be also considered to study the cooperation mechanism among multiple sector cooperation[25] including clarifying responsibilities of related stakeholders, coordinating mechanism among all parties, cost sharing and benefit allocation mechanism for each party, thus to provide scientific evidence to policy making within the background of new medical reform in China on the basis of the research of international chronic disease management model[26].

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