

# Women and the Role of Physical Activity in Chemical Dependency Treatment

## A Preliminary Look

Lynn Jaffee and Simi Ahuja

### Introduction

CHEMICAL DEPENDENCY AMONG WOMEN IS A SERIOUS PROBLEM IN this country. For instance, of the 10 million or more alcoholics currently in the United States, an estimated 30 to 50 percent are women (Kirkpatrick).

Despite the fact that there are so many chemically dependent women in this country, only a small portion of the research directed at substance abuse focuses on women (Harrison). This lack of information is especially unfortunate when one considers the physical, psychological and cultural issues confronting chemically dependent women.

There is little literature on women and polydrug (multi-drug) use (Taylor & St. Pierre). The literature that does examine women and chemical dependency focuses on alcohol use. Reports on women and alcohol cite distinct physical differences between women and men. For example, if a woman and a man of the same height and weight drink the same amount of liquor, they will not be equally drunk. The woman, who has more body fat, and therefore less body fluid to dilute the alcohol, will become the drunker of the two (Witters, Venturelli, p. 205). If a woman is premenstrual, smaller amounts of alcohol may produce inebriation than are necessary at another time in the menstrual cycle (*Medformation*). Because this fact is not well known and because not all women are sensitive to their own patterns of menstrual change, these differences may be surprising and unexpected for women.

Women who abuse alcohol generally begin drinking heavily later in life than men, yet become alcoholic more quickly (*Medformation*). Also, women alcoholics tend to have more serious health problems than men. For example, women alcoholics have been found to develop cirrhosis faster and from drinking smaller amounts than men, and on the average women die from cirrhosis at a younger age than men (*Medformation*). Statistics have also shown that alcohol-dependent women have more circulatory, digestive and accident fatalities (*Medformation*).

Recent research has also indicated that women have less of the enzyme that breaks down alcohol in the stomach than men, allowing more alcohol to enter the bloodstream. This difference between women and men means that all

other things being equal, the effect of the same amount of alcohol will be felt more by a woman. This may also explain why alcoholic women are more likely to have liver damage than alcoholic men (Frezza et al.).

### Stereotypes of Chemically Dependent Women

Women who abuse alcohol and drugs are often stereotyped and viewed differently than men with similar dependencies. It is important to understand the stereotypes so we can have a better understanding of women's experience of chemical dependency and because a woman's actual experience is often very different from the stereotypes.

Perhaps the most common stereotype of the chemically dependent woman is of the slovenly, repulsive drunk. As Marian Sandmaier states in *The Invisible Alcoholics*, "Ladies don't get drunk" (Sandmaier, p. 2). To some degree, alcoholic men have avoided this stigma of the disgusting drunk, and in fact, some male alcoholics, such as W. C. Fields, Dean Martin and Charlie Chaplin, are celebrated.

The chemically dependent woman defies the ideal image of wife, mother, caretaker and nurturing person. She is seen as a "non-woman" and is "un-sexed" by her chemical dependency (Sandmaier, p. 22). While men may struggle with many issues related to their substance abuse, they are not un-sexed by it; in fact, drinking or drug use is viewed by many as a masculine activity.

Another common stereotype of the drinking woman is that of the sexually available, promiscuous woman who hangs out in bars, waiting for a sexual encounter (Sandmaier, p. 14). The reality is that the majority of alcoholic women drink at home (Kirkpatrick, p. 92). Also, many alcoholic women have a decreased interest in sex (Sandmaier, p. 15) and, by some estimates, as many as 50 to 70 percent of alcoholic or drug dependent women have been sexually abused or harassed at some time in their lives (Kirkpatrick, p. 96).

The double bind is that alcohol or drugs are often pressed on women in the hope that they will become more sexually receptive and compliant. Yet when they do comply, they are labeled as loose or whorish. Alcohol and

some drugs loosen inhibitions in both men and women, and the woman who has been using these substances may be more susceptible to men's advances or even rape. This vulnerability can make women more open to accusations of promiscuity (Sandmaier, p. 14).

## **Emotional Health and Chemically Dependent Women**

While each woman who is chemically dependent has a unique set of circumstances, professionals in the chemical dependency area have found common emotional patterns and issues among women who abuse drugs or alcohol and/or are in treatment.

Chemically dependent women may struggle with feelings of worthlessness, helplessness, guilt and shame (Laign). It has been established that women who abuse drugs or alcohol have lower self-esteem, higher anxiety levels and feel more alienation, when compared with both nonabusing women and alcoholic men (Taylor and St. Pierre).

Depression is perhaps the most prevalent obstacle for women who are seeking treatment for chemical abuse. Women recovering from substance abuse describe their depression as a low point in their life, a feeling of great loss or emptiness (Kirkpatrick, p. 44). For women, this depression often lasts a long time into recovery. Fighting depression is also considered by some to be the hardest part of becoming well (Kirkpatrick, p. 49).

## **Physical Fitness and Mental Health**

Lack of physical fitness certainly is not the cause of chemical dependency or the mental state associated with drug abuse. However, research supporting the positive mental benefits of exercise raises the question of what might be the role of physical activity in chemical dependency treatment programs.

Various researchers over the past decade have focused on the role physical activity plays in mental health. Studies have shown that aerobic exercise can improve symptoms of depression and anxiety, and it can boost self-concept (Folkins and Sime). Tucker, et al. found that physical fitness can increase hardiness and act as a deterrent to stress. While the exact mechanism through which exercise improves mental health is unclear, physical activity produces physiological changes that contribute to positive mental outlook. In relieving anxiety, physical activity relaxes muscles, alleviates fatigue and encourages sound sleep (Ledwedge).

Further, biochemical changes in the brain associated with physical activity may be helpful in alleviating depression. Norepinephrine, a neurotransmitter of the sympathetic nervous system known to be low in depressed persons, has been found to increase dramatically with physical exercise (Ledwedge).

Several researchers have explored the reasons fitness is an important component in the rehabilitation process. Many of these studies have been restricted to male participants or have neglected to explore the personality and

physical differences between men and women and the ways these differences, coupled with physical activity, may play a role in their rehabilitation programs. Nonetheless, analysis of these studies has shown that physical fitness is an important component in the rehabilitation process. Though research is continuing in this field, in our own search for resources we found the material to be limited. More research is needed for future progress in this field of study.

## **Studies Examining the Role of Physical Fitness and Chemical Dependency Recovery**

The following studies are among those that point to the likelihood that physical activity is beneficial in a chemical dependency treatment setting.

A 1972 study involving 20 male alcoholics, aged 35 to 55, examined the ways jogging affected hospitalized alcoholics (Gary & Guthrie, 1972). Participants jogged one mile five times a week for four weeks. Results after 20 days of jogging included noticeable changes in the study participants such as lower pulse rate and reduced sleep disturbances. "The inability to get a good night's sleep is a common complaint of alcoholic patients in the hospital and contributed in some to build-up of stress which led to drinking episodes" (Gary & Guthrie, 1972).

In a study conducted by Frankel and Murphy in 1974, the psychological benefits of exercise in alcohol treatment programs were examined. Frankel and Murphy incorporated the MMPI in their study of 214 male alcoholic patients at V.A. Hospital in Salem, VA. The average age of the participants was 45 (range 28-56). Before engaging in the 12-week fitness program, patients received physical exams; all were considered to be in poor health.

The study focused on two components: physical fitness and personality. The exercise program consisted of one-hour sessions, five days a week, including a 10-minute warm-up and 20 minutes of calisthenics, followed by 15 minutes of individual work. The remaining 20 minutes focused on aerobic work. In addition to the fitness program, patients participated in group psychotherapy, education and family counseling. Patients were again examined upon their completion of the program. Results included substantial changes in the personalities of the participants (based upon the standard 13-scale MMPI). The most notable changes were decreases in depression and blame projection. Based on specific variables on the MMPI, the researchers attributed these changes to the patients' participation in the physical fitness program.

A 1982 study, conducted by Sinyor, et al. in Quebec, involved 46 male and 12 female patients, with a mean age of 42. This six-week study considered the relationship between physical fitness and abstinence in alcoholics. A comparison was conducted between nonalcoholics who participated in a similar program.

Two exercise groups were established following a medical evaluation. Patients either participated at a full or lower level of intensity, depending on their health. The one-

*Continued on next page*

hour sessions, conducted every morning, consisted of warm-up and stretching exercises, followed by light calisthenics and 12 minutes of aerobics. The classes closed with a cool-down session.

Researchers examined data three months after completion of the program. Abstinence rates were compared with those of two control groups: 1) those who did not participate in the physical fitness program and 2) patients treated at four other centers in Quebec. Results included personal observations by patients, relatives and employers in regard to abstinence. It was observed that patients who participated in the physical fitness program "experienced qualitative changes in fitness not unlike those found in non-alcoholics who exercise regularly" (Sinyor, et al. 1982). Further, after three months, 69.3% of the patients who participated in the fitness program remained abstinent, compared to 38% of those patients who did not participate in the program and 37% of those patients at the other treatment centers in Quebec during the same time. It was noted in an 18-month follow-up that most patients, following departure from the treatment centers, did not maintain their higher level of fitness. Differences, if any, between men and women in this study were not explored.

In addition to research, several programs have focused on a holistic approach, which includes a fitness component as part of treatment. At the Franciscan Program at St. Francis Medical Center in Cape Girardeau, MO, patients engage in a contracted program that monitors their behavior and exercise patterns. An educational program presents patients with information about exercise and fitness and means of incorporating it into their lifestyles. Emphasis is placed upon "the whole person — the physical, emotional, mental and spiritual selves" (Murray).

Patients learn how to monitor their own fitness levels while taking into account their own special circumstances and needs. Consideration is given to the importance of a proper warm-up and cool-down and the importance of reaching target heart rate. This education process is structured so that patients may continue to use it after they leave the treatment facility. Two weeks after beginning the fitness program, patients are evaluated to determine whether they have kept the goals they stated in their contracts. "Results suggest that the majority of patients do fulfill contract obligations or do make significant progress toward their personal contract goals" (Murphy).

Bartha and Davis (1982) of Ohio State University advocate a similar approach for treatment. In what they term "high level fitness," Bartha and Davis believe that a fitness program educates alcoholics and promotes healthier lifestyles. They recommend a five-point wellness program of nutritional awareness, physical fitness, stress management, environmental sensitivity and self-responsibility.

## Method

A two-page questionnaire on physical activity and chemical use patterns was created by the research staff of Melpomene Institute in order to determine the respondents' view of physical activity in chemical dependency

treatment. The questionnaire had two sections. The first section requested demographic data, information about drug use and number of times in treatment. Women who were currently in treatment answered one version of Section II, while women in recovery answered a different version.

A woman was considered to be in recovery if she had not used drugs or alcohol for at least two months. Information gathered from both groups concerned the respondents' physical activity patterns prior to treatment, whether their current or most recent treatment program included a structured physical activity program and the opinion of the respondent as to the benefit of such a program.

Questionnaires were distributed through a convenience sample of chemical dependency counselors and treatment facilities in the Twin Cities and central Minnesota area. Participation was voluntary, and the anonymity of respondents was assured.

## Description of the Sample

Eighty-two women responded to the questionnaire, with 44 categorized as being currently in treatment and 38 categorized as being in post-treatment recovery.

Mean age for the entire sample is 32.1 years, with 28.2 years being the mean age for respondents in treatment and 36.7 being the mean age for respondents classified as in recovery.

Period of time since last chemical use is reported in months, with 22.4 months being the mean length of time for the entire sample. The mean time period since last chemical use for the treatment group was 2.9 months. The mean for the recovery group is 45.6 months, or 3.8 years.

The entire sample has been in treatment an average of 1.9 times, with the treatment group averaging 1.8 times in treatment and the recovery group 2.1 times.

The abused drug of choice for both groups was alcohol, chosen by 70.5% of the treatment respondents and 78.9% of the recovery respondents. The second most abused drug

Respondents' Drug of Choice							
		Entire Sample N=82		In Treatment N=44		Recovery N=38	
Drug Used	#	%	#	%	#	%	
Alcohol	61	74.4	31	70.5	30	78.9	
Cocaine	17	20.7	10	22.7	7	18.2	
Marijuana	7	8.5	4	9.1	3	7.9	
Barbituates	3	3.7	1	2.3	2	5.3	
Amphetamines	4	4.9	2	4.5	2	5.3	
Sedatives	1	1.2	0	0	1	2.6	
Hallucinogens	1	1.2	0	0	1	2.6	
Minor							
Tranquillizers	1	1.2	0	0	1	2.6	
Narcotics	2	4.5	2	4.5	0	0	

Table 1

### Other Drugs Used by Respondents

Drug Used	Entire Sample N=82			In Treatment N=44			Recovery N=38		
	#	%	Valid %	#	%	Valid %	#	%	Valid %
Marijuana	30	36.5	44.8	17	38.6	44.7	13	34.2	44.8
Cocaine	13	15.9	19.4	10	22.7	26.3	3	7.9	10.3
Hallucinogens	17	20.7	25.4	13	29.5	34.2	4	10.5	13.8
Alcohol	12	14.6	17.9	6	13.6	15.8	6	15.8	20.7
Narcotics	6	7.3	9.0	4	9.1	10.5	2	5.3	6.9
Amphetamines	19	23.2	28.4	8	18.2	21.1	11	28.9	37.9
Sedatives	6	7.3	9.0	4	9.1	10.5	2	5.3	6.9

Table 2

was cocaine, with 22.7% of the treatment and 18.4% of the recovery respondents naming cocaine as the drug of their choice. Marijuana and marijuana derivatives, such as hash and hash oil, was the third most frequently mentioned drug by both groups as their drug of choice, named by 9.1% of the treatment group and 7.9% of the recovery group. Drug of choice for the entire sample and by group is found in Table 1.

Table 2 summarizes other drugs, in addition to the drug of choice, used by the women in this sample. For those respondents currently in treatment, the most commonly used other drugs were 1) marijuana, 2) hallucinogens and 3) cocaine. For respondents in recovery, the most commonly used other drugs were 1) marijuana, 2) amphetamines, 3) alcohol and (4) drugs whose street names were unknown. Other drugs that were used by the entire sample and by each groups are shown in Table 2.

Route of administration for ingested drugs was primarily oral for both groups, followed by smoking, inhalant and intravenous. Route of administration for ingested drugs is shown in Table 3.

Physical activity prior to chemical dependency treatment is shown in Table 4 and Figure 1. From Table 4, we can see that only six of the women in the treatment group and three of the women in the recovery group had been

regularly active at least three days per week. More typically, the women in both groups engaged in physical activity infrequently or not at all. In Figure 1, we see that the women engaged in a variety of sports, with walking as the most popular sport. Housework was cited by three women in the recovery group as a physical activity. In addition, two women said prior physical activity consisted of trips to the liquor store. Two women said sex was their physical activity, and one woman said that prior physical activity consisted of "lifting 8 ounces of booze to her mouth." Other actual sports cited were golf, basketball, skiing and skating.

### Results and Discussion

This study focused on the effect of a structured physical activity program in the context of a chemical dependency treatment program. This study differs from other research on the effects of physical activity in chemical dependency treatment in that we are concerned with women's subjective

### Respondents' Route of Administration

	Entire Sample N=82		In Treatment N=44		Recovery N=38	
	#	%	#	%	#	%
Oral	79	96.3	42	95.5	37	97.4
Inhaled	26	31.7	17	38.6	9	23.7
Smoked	39	47.6	20	45.5	19	50.0
Intravenous	4	4.9	2	4.5	2	5.3

Table 3

### Physical Activity Prior to Chemical Dependency Treatment in Days per Week

	In Treatment N=44		Recovery N=38	
	#	%	#	%
3-7 Days/Week	6	13.6	3	7.8
2 Days/Week or Less	0	0	1	2.6
Infrequently	11	25	13	34.2
None	10	22.7	8	21.1

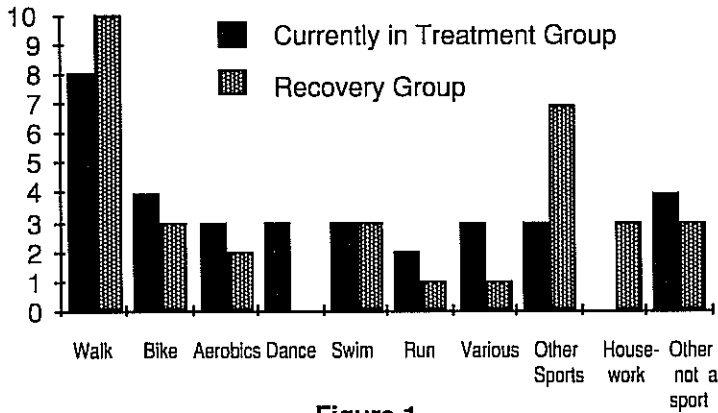
#### Missing Data:

N=17 for Treatment Group; N=12 for Recovery Group

Table 4

Continued on next page

**Physical Activity Prior to Chemical Dependency Treatment**



**Figure 1**

experience. This study looks at women’s experience or perceptions of the benefit of physical activity as a part of their treatment for chemical dependency.

Figure 1 and Table 4 show that, although the respondents engaged in a variety of sports prior to treatment, only a very few of the women were physically active on a regular basis. Of those women currently in treatment, only 6 of 44 were active on a regular basis prior to treatment and, of the recovery group, only 4 of 38 had been active on a regular basis prior to treatment.

When we look at physical activity programs in treatment, we find that, of our total sample, 43.2% (N=19) of those women currently in treatment and 44.7% (N=17) of those women in recovery had such a program in their most recent treatment.

The physical activity that the women participated in during treatment varied widely. The respondents were active anywhere from one to seven days per week. Sports within the described programs included walking, aerobics, swimming, biking, volleyball and running. Also mentioned by respondents was “working out” in general or going to the gym or the YWCA.

Those women who were currently in treatment but were not exposed to a physical activity program were asked if they thought a physical activity component would be useful in their treatment. Fifty percent of those who answered the question felt that a physical activity program included in their treatment would have been a positive addition. The other 50% felt that physical activity would have had no effect. This group is not commented on further in this report.

When looking at the recovery group of women as a whole, the benefits of physical activity are more obvious. We asked the women in recovery if physical activity in general plays a role in maintaining recovery or sobriety. Of those who answered (34 of 38), 67.6% (N=23) said yes. About one-third of the women, 32.4% (N=11), said that physical activity does not play a role in maintaining recovery.

Among those women who were exposed to a physical activity program in treatment, the perceived benefits of

such a program differed between the treatment and recovery groups. Table 5 depicts the role of physical activity among women in both groups who were exposed to a physical activity program in treatment. For the currently in-treatment group, the benefits of a physical activity were not clear-cut. The most commonly cited benefits were 1) physical benefits, 2) stress reduction and 3) mental benefits in general.

For the recovery group, however, the benefit of stress reduction as a result of physical activity was cited by a majority (69.2%) of the women. Other benefits commonly cited by this group were increase in self-esteem and physical and social benefits.

The most common responses to this question among the women who are currently in treatment was mixed between the physical benefits of exercise and stress reduction, while stress reduction was the clear-cut benefit for those women in recovery.

Also, while the literature points to the possibility that physical activity helps alleviate depression, which is especially common among women in treatment, none of the women answering this question said that physical activity played a role in lifting depression in a treatment setting. However, three women in the recovery group said that physical activity was helpful in maintaining sobriety after treatment because it helped lift depression. For example, one woman said “...[exercise] plays a part in my mental well-being which, of course, is connected to my sobriety. I have PMS, have struggled with depression and mood swings in my life. Exercise is a vital part of my well-being.”

Further, the actual benefits or role of physical activity seem less apparent to women at the time that they are participating in a chemical dependency treatment program. While stress reduction was cited by many of the women in the recovery group, that insight is in retrospect and may not have been clear to the women at the time that they were actually in treatment.

	In Treatment N=17		Recovery N=13	
	#	%	#	%
Stress Reduction	5	29.4	9	69.2
Physical Benefits	6	35.3	2	15.4
Important in General	1	5.9	1	7.7
Negative/No Benefits	0	-	0	-
General Mental Benefits	4	23.5	0	-
Increased Self-Esteem	2	11.8	3	23.1
Something to Do with Time	2	11.8	0	-
Helps to Stay Sober	3	17.6	0	-
Socialization/ Social Benefits	0	-	2	15.4
Other	2	11.8	1	7.7

**Table 5**

**Effect of Physical Activity Broken Down by Program/No Program in Last Treatment**

Recovery Group	Phys. Act. Played a Role in Sobriety/ Recovery		Phys. Act. DID NOT Play a Role in Sobriety/Recovery	
	#	%	#	%
Structured Physical Activity in Last Treatment	12	80.0	3	20
No Structured Physical Activity in Last Treatment	10	58.5	7	41.2

**Table 6**

When this recovery group is broken down by those who had a structured program in their last treatment and those who did not, we see that physical activity plays the largest role. As Table 6 illustrates, 80% (N=12) of the women who had a structured physical activity program in their last treatment said that physical activity plays a role in maintaining their recovery or sobriety. Only 20% (N=3) of the women who had a structured physical activity program said that physical activity does not play a role in their recovery.

The women who are currently in treatment do not see overwhelming benefits to a physical activity program. However, a majority of the women who are recovering from chemical use do, in fact, say that physical activity plays a role in their maintaining recovery. This is especially apparent in looking at women who were exposed to a structured physical activity component in their most recent chemical dependency program.

It seems that a time factor might account for the difference between the treatment and recovery groups. It is possible that the benefits, or the impact, of physical activity do not become apparent immediately. Treatment is an intense, emotional experience for most of these women. Therefore, it is only after a period of several months or longer that the recovering woman begins to appreciate the role of physical activity. The woman who is currently participating in a chemical dependency treatment program is not primarily concerned with the benefits or effects of an exercise program, but rather with many other issues associated with chemical abuse.

The role of exercise may not be apparent to these women at the time of treatment because it takes time for a regular physical activity habit to develop. Additionally, it takes a period of time for positive benefits to appear.

It is important to note that when asking about the effects of physical activity, we used the term "role", rather than "benefit". We did this in order not to attach a positive or a negative value to physical activity. There were, how-

ever, no negative effects expressed by any respondent in this study. Also, in reviewing the data, we find that a large number of respondents have not been or are not currently physically active.

**Conclusion**

The following findings emerge from this study of 82 women, 44 of whom are considered currently in treatment for chemical dependency and 38 of whom are considered in recovery from chemical dependency:

1. For those women currently in a treatment program for chemical dependency, the benefits of a structured physical activity program are not obvious.
2. For those women who are in recovery from chemical dependency, 69.2% say that stress reduction is a primary benefit of a structured physical activity program.
3. In the recovery group, those women who had been exposed to a structured physical activity program were much more likely (80% vs. 58.5%) to see physical activity as a factor than those who did not have this exposure.

In considering the various issues confronting women who are struggling with chemical dependency, the positive mental benefits cited by these women, such as stress reduction and increase in self-esteem, must be taken into account. In light of these findings, we feel that the possible long-term benefits of a physical activity component in chemical dependency treatment should be considered. We would encourage the inclusion of a physical activity program in chemical dependency treatment for women.

This pilot study points to a need for additional research on this topic. With minor changes, we plan to replicate this research with a larger national sample. ○

**Acknowledgements**

*We thank Hazelden Foundation and the chemical dependency counselors who worked with us on this project for their input and for distributing questionnaires. We also thank Jan Lloyd, Lee Zurek and Boeckmann Library for their help with this project.*

*The results from this pilot study point to a need for further exploration of the role of physical activity in chemical dependency treatment. We propose to expand this study using a nationwide sample.*

*We ask for members' help in conducting this study. First, your comments or suggestions on this topic are welcome and valued. Second, we would like to hear from you or from anyone you know, such as chemical dependency counselors, who would be willing to distribute questionnaires. We would also like to hear from individuals who are interested in participating in this study by completing a questionnaire.*

*Call or write Melpomene Institute, 1010 University Ave., St. Paul, MN 55104, (612)642-1951.*

# Chemical Dependency

## Selected Bibliography

- Women: The invisible alcoholics. Abbott Northwestern Hospital *Medformation*, 4:3, Winter, 1989, 4-5.
- Mind and body: The exercise connection. Abbott Northwestern Hospital *Medformation*, 5:5, Summer, 1989, 4-5.
- Amaro, H., Beckman, L.J. and Mays, V.M. A comparison of black and white women entering alcoholism treatment. *Journal of Studies on Alcohol*, 48:3, 1987, 220-228.
- Asher, R. and Brissett, D. Codependency: A view from women married to alcoholics. *International Journal of the Addictions*, 23:4, 1988, 331-350.
- Banonis, B.C. The lived experience of recovering from addiction: A phenomenological study. *Nursing Science Quarterly*, Spring, 1989, 37-43.
- Bartha, R. and Davis, T. Holism and high level wellness in the treatment of alcoholism. *Journal of Alcohol and Drug Education*, 28, 1982, 28-31.
- Beckman, L.J. and Amaro, H. Patterns of women's use of alcohol treatment agencies. *Alcohol Health and Research World*, Winter, 1985, 15-25.
- Bissell, L. and Skorina, J.K. One hundred alcoholic women in medicine. *Journal of the American Medical Association*, 257:21, June 5, 1987, 2939-2944.
- Bradstock, K., Forman, M., et al. Alcohol use and health behavior lifestyles among U.S. women: The behavioral risk factor surveys. *Addictive Behaviors*, 13:1, 1988, 61-71.
- Calajoe, A. Yoga as a therapeutic component in treating chemical dependency. *Alcoholism Treatment Quarterly*, 3:4, Winter, 1986, 33-46.
- Cappell, H. and Herman, C.P. Alcohol and tension reduction. *Quarterly Journal of Studies on Alcoholism*, 33, 1972, 33-64.
- Folkins, C.H. and Sime, W.E. Physical fitness training and mental health. *American Psychologist*, 36:4, April, 1981, 373-389.
- Frankel, A. and Murphy, J. Physical fitness and personality in alcoholism: Canonical analysis of measures before and after treatment. *Quarterly Journal of Studies on Alcoholism*, 35, 1974, 1272-1278.
- Fredrickson-Smith, C. Treatment for women only? Yes. *Alcoholism and Addiction*, May-June 23, 1987.
- Frezza, M. et al. High blood alcohol levels in women: The role of decreased gastric alcohol dehydrogenase activity and first-pass metabolism. *New England Journal of Medicine*, 322:2, January 11, 1990, 95-99.
- Gary, V. and Guthrie, D. The effect of jogging on physical fitness and self-concept in hospitalized alcoholics. *Quarterly Journal of Studies on Alcoholism*, 33, 1972, 1073-1078.
- Greist, J.H., Klein, M.H., et al. Running through your mind. *Journal of Psychosomatic Research*, 22:4, 1978, 259-294.
- Hanson, D.J. Drinking attitudes and behaviors among college students. *Journal of Drug Education*, Spring, 1974, 7-14.
- Harrison, P.A. and Belille, C.A. Women in treatment: Beyond the stereotype. *Journal of Studies on Alcohol*, 48:6, 1987, 574-578.
- Hayes, R.W. and Tevis, B.W. A comparison of attitudes and behavior of high school athletes and non-athletes with respect to alcohol use and abuse. *Journal of Alcohol and Drug Education*, 23:1, 1977, 20-28.
- Hutchinson, S.A. Toward self-integration: The recovery process of chemically dependent nurses. *Nursing Research*, 36:6, November-December, 1987, 339-343.
- Kirkpatrick, J. Women and alcohol. *Turnabout: Help for a New Life*. Garden City, NY: Doubleday & Co., 1977.
- Kirkpatrick, J. *Goodbye Hangovers, Hello Life, Self-Help for Women*. New York: Atheneum, 1986.
- Kroft, C. and Leichner, P. Sex-role conflicts in alcoholic women. *The International Journal of the Addictions*, 22:7, 1987, 685-693.
- Laign, J. How far have we really come, baby? *Focus*, Sept.-Oct. 14, 1987.
- Ledwidge, B. Run for your mind: Aerobic exercise as a means of alleviating anxiety and depression. *Canadian Journal of Behavioral Science*, 12:2, 1980, 126-140.
- Morgan, W.P., Roberts, J.A. and Feinerman, A.D. Psychologic effect of acute physical activity. *Archives of Physical Medical Rehabilitation*, 52, 1971, 422-425.
- Moyer, M. Women and trauma: Stepping beyond survival to recovery. *Alcoholism and Addiction*, July-August, 1988, 46-47.
- Murphy, P.A. Fitness and recovery. *Alcohol Health and Research World*, 72, Fall, 1986, 30-32.